

**The Emergence and Development of Pretend Play in a Community Sample of
Children: A Longitudinal and Mixed Method Investigation from Infancy to
Early Childhood**

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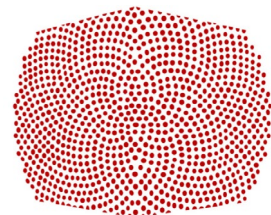
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Contributions to the Cardiff Child Development Study

The Cardiff Child Development Study (CCDS), the source of data for Study 1 (Chapter 4) and Study 2 (Chapter 5) in this thesis, is a prospective longitudinal study of a nationally representative sample of 332 first-time mothers and their children. Parents were first interviewed during pregnancy (Wave 1) and the families were then followed up at five additional time points (Waves 2-6). Recruitment started in 2006 and the final phase of data collection ended in 2015. I joined the CCDS in March 2013, at the beginning of Wave 6, as a full time Research Assistant. I commenced my PhD in October 2015. Page xii will outline my main contributions to the CCDS study between 2013-2015, page xiii will outline my main contributions since commencing my PhD.

I contributed to the sourcing and development of the child assessment measures used at Wave 6. I was responsible for contacting a sample of the CCDS families to take part in this final phase of the research; I arranged home visits for around a third of the families who participated. I collected child assessment data at a substantial number of the home visits at Wave 6; I administered a battery of tasks designed to assess the child's social, emotional and cognitive development, I also administered family interaction tasks.

I was solely responsible for collecting questionnaire data from the teachers of the children at Wave 6 of the study. This involved contacting teachers by post, telephone, email and visiting the schools. I was successful in collecting teacher questionnaire data for 90% of the sample assessed at Wave 6. I also assisted with checking the data on the final data file.

I collaborated with CCDS colleagues on the coding of conflict, cooperation and cooperative pretend play during free play at the Wave 5 assessment. This collaboration continued while I was undertaking my PhD. I also assisted with training students on research protocols and data management.

In terms of the data reported in this thesis, I devised an observational coding scheme for identifying pretend play during free play at Wave 3, 4 and 5 of the CCDS Study (presented in Chapter 4 and Chapter 5). I coded all of children's displays of pretend play at the infancy birthday parties (Wave 3 assessment, data reported in Chapter 5), 31% of children's displays of pretend play during spontaneous free play at the Wave 4 assessment (data reported in Chapter 4), and all of children's displays of pretend play at the early childhood birthday parties (Wave 5 assessment, data reported in Chapter 5). I used data from questionnaires completed by participants at Wave 4 and Wave 5 of the study to create categorical measures of children's pretend play competence at these time points (data reported in Chapter 4 and Chapter 5).

I also assisted with coding on other CCDS research projects. I coded 50 % of children's vocal and behavioural distress shown during the bear procedure at the Wave 5 assessment; working on this project enhanced my knowledge of the CCDS simulated birthday party paradigm. I provided reliability coding for 25% of children's verbal, and non-verbal, engagement with Playmobil at the Wave 6 assessment and reliability coding for 25% of children's immersion in a video game at the Wave 6 assessment; my knowledge of children's imaginative activities was enhanced by working on these projects.

I supervised and mentored summer intern students, carried out proofreading of manuscripts for CCDS colleagues and assisted in the relocation of equipment and confidential data. I additionally assisted with open days and tours of the Cardiff University Centre for Human Development Science (CUCHDS), where the CCDS is based. These tasks increased my general knowledge of the CCDS.

Summary

This thesis investigated fundamental questions about the emergence and development of pretend play. This topic was primarily investigated in the context of the Cardiff Child Development Study (CCDS), a prospective longitudinal study of a nationally representative sample of first-time mothers and their children.

In Chapter 2, I reviewed earlier literature that reports on the proportions/percentages of children who have been observed to show pretend play between the ages of 18 to 30 months. Not all children were reported to engage in pretend play, this was especially evident within the 18 to 23-month age bracket. The review highlighted methodological limitations of earlier studies.

In Chapter 4 (Study 1), using data from the CCDS study, I investigated if there was almost universal emergence of pretend play between the ages of 17 and 24 months. I used a mixed method approach (direct observation of unstructured free play sessions combined with informant report questionnaire data) that was largely absent from the literature base. Displays of pretend play were identified using a new observational coding scheme I developed. Not all children displayed, or were reported to, engage in pretend play. Exposure to sociodemographic adversity was associated with reported pretend play capacity.

In Chapter 5 (Study 2), I conducted a longitudinal analysis of children's pretend play from infancy to early childhood. Video records of two identical free play sessions conducted during infancy and early childhood were examined for instances of pretend play using newly developed age-appropriate modules of the new observational coding scheme. Pretend play was observed around the time of the first birthday, in a minority of infants. Alongside a significant increase in displays of pretend play over time, in both the proportion of children displaying pretend play and in the frequency shown, it was found that infants who had

displayed any pretend play, and those who engaged in more frequent pretend play in infancy, displayed more frequent pretend play in early childhood.

Chapter 1.

1. Introduction

1.1 Overarching Aims of the Thesis

Pretend play in early childhood has long been investigated (e.g., Piaget, 1962; Lowe, 1975; Fenson, Kagan, Kearsley & Zelazo, 1976; Rosenblatt, 1977; Belsky & Most, 1981; McCune, 1995; Nielsen & Dissanayake, 2004; Lillard et al., 2013). Recent debates have focused on the possible benefits of pretend play in relation to children's social and cognitive development and its use as an educational tool (Lillard et al., 2013; Bergen, 2013; Göncü & Vadeboncoeur, 2015); however, more fundamental questions about the emergence and development of children's pretend play *itself* still require further investigation (Göncü & Vadeboncoeur, 2015; Palacios et al., 2016). The following fundamental questions will be addressed in this thesis:

- When does pretend play emerge for the vast majority of children in general populations?
- Is the emergence and development of pretend play constrained by social adversity?
- Around the time of the first birthday, can some infants already display *pretend play*?
- Are individual differences in displays of pretend play during infancy stable over time?

Studies on the emergence and development of pretend play are certainly not new; however, these fundamental questions remain untested in relatively large community samples of children, nationally representative of the UK population, followed longitudinally from around the time of the child's first birthday into early childhood. Additionally, there is a dearth of research investigating the emergence and development of pretend play with mixed methods of data gathering; therefore, we lack a full understanding of how findings on the emergence

and development of pretend play compare if different methods of data gathering are used. This thesis aims to fill these gaps in the literature. In the current body of work, I aim to explore the emergence and development of pretend play using data from the Cardiff Child Development Study, a UK-based, nationally representative, prospective longitudinal study of 332 first-time parents and children. Both observational and informant-reported questionnaire data will be examined to investigate fundamental questions about early pretend play.

1.2 The Importance of Continued Study of Children's Early Pretend Play

Children's engagement in pretend play is considered a universal activity (Piaget, 1962; Baron-Cohen, Allen & Gillberg, 1992; Baron-Cohen et al., 1996; Haight, Wang, Fung, Williams, & Mintz, 1999; Gaskins, 2013; Lillard, 2015) and there appears general agreement that the first examples of pretend play are evident by 18 to 24 months of age (Piaget, 1962; Sinclair, 1970; Largo & Howard, 1979; Ungerer, Zelazo, Kearsley & O'Leary, 1981; Nielsen & Dissanayake, 2004; Rutherford, Young, Hepburn & Rogers, 2007; Wilson et al., 2017; Cabrera, Karberg, Malin, & Aldoney, 2017). An absence of pretend play around this age range is therefore viewed as an indicator of developmental delay or the possible presence of developmental disorders such as autism spectrum disorder¹ (Baron-Cohen et al., 1992; Barbaro & Dissanayake, 2012; Wilson et al., 2017). Consequently, the measurement of children's pretend play abilities is included on early clinical screening instruments that indicate current or future diagnosis of autism (e.g., the Modified Checklist for Autism in Toddlers instrument [M-CHAT]; Robins, Fein, Barton & Green, 2001), and on play assessment instruments that indicate the presence of other developmental delays and disorders, including language and social-communication disorders (e.g., the Westby Symbolic Play Scale, 1980; 1991; 2000). Recently, there has been a drive for earlier

¹ Autism spectrum disorder (American Psychiatric Association, 2013; hereafter autism)

identification of autism (Kleinman et al., 2008; Luyster et al., 2009; Barbaro & Dissanayake, 2012) and social communication delays (Wetherby & Prizant, 2001).

If we are to view the absence of early pretend play as an indicator of current, or predictive of future, developmental delays and disorders, we need to understand when the capacity to show pretend play emerges for most children in general populations. Many of the autism screening instruments that include measurement of pretend play are designed for use with children from 18 months of age: the Checklist for Autism in Toddlers (CHAT; Baron-Cohen et al., 1992,1996) instrument was designed for children aged 18 months onwards; the Q-CHAT (Alison et al., 2008) and Social Attention and Communication Study behavioural items (SACS ‘items’; Barbaro & Dissanayake, 2012) instruments for use between 18 to 24 months of age, and the M-CHAT (Robins et al., 2001) and Modified Checklist for Autism in Toddlers, Revised, with Follow-Up (M-CHAT R/F; Robins, Fein & Barton, 2009) from 16 months of age (until 30 months of age)². If we are to view the absence of early pretend play in these age ranges as an indicator of current, or predictive of future, developmental delays and disorders, we need to be clear about the percentage of children in these age brackets (i.e., during the second and third years) who display early pretend play in community samples representative of the general population.

It was discussed in the most recent edition of *Play Diagnosis and Assessment* (Gitlin-Weiner, Sandgrund, & Schaefer, 2000) that in devising any developmental play assessment, it is necessary first to study ‘normal developmental process’ to then detect any delays in the onset of behaviours. However, much of previous research into early pretend play has many methodological flaws (Lillard et al., 2013); with a focus on western and middle-class samples of children (discussed by Farver & Howes, 1993; Haight & Miller, 1993; Lillard, 2015) and a

² NB. This list is not exhaustive; see Barbaro & Dissanayake (2009) for details of additional screening instruments used for early identification of autism.

notable shortage of longitudinal studies (Lillard, 2013; Cabrera et al., 2017), we may not have a full perspective on so-called ‘normal’ play emergence and development (Göncü & Vadeboncoeur, 2015). We may be lacking a full understanding of when pretend play emerges for most children and what percentage of children display pretend play at different time points in general populations. Therefore, new studies with samples of children representative of general populations are needed.

An understanding of children’s capacity for displaying pretend play during the toddler period is of importance in early education settings. The standards for the development, care and learning of children between 0 to 5 years of age in England (UK) are set out in the Early Years Foundation Stage (EYFS) guidance materials; all Early Years providers and schools must follow the guidance and curriculum (www.gov.uk, 2019). There are seven areas of learning taught, and assessed, during the EYFS (e.g., *Communication and Language*) (www.gov.uk, 2019). The *Early Years Outcomes* (2013) document, “a non-statutory guide for practitioners and inspectors to help inform understanding of child development through the early years” (Department for Education [DfE], 2013, p. 1) is used by professionals following the EYFS to assess and inform “whether a child is showing typical development for their age, may be at risk of delay or is ahead for their age” (p. 3).

Observations of pretend play behaviours inform such assessments of how a child is developing, and progressing, in three of the main areas of learning: *Communication and Language; Personal, Social and Emotional Development; Understanding the World*. The *Early Years Outcomes* (2013) document sets out “typical” pretend play behaviours expected in the age bracket of 16 to 26 months; these include: (1) “Gradually able to engage in pretend play with toys” (p. 15) and (2) “Pretends that one object represents another, especially when objects have characteristics in common” (p. 32). Within the 22 to 36-month age bracket, the expected behaviours are: “In pretend play, imitates everyday actions and events from own

family and cultural background, e.g. making and drinking tea” (p. 27). While additional guidance materials note that: “children develop at their own rates... the development statements ...should not be used as checklists...these are not fixed age boundaries but suggest a typical range of development.” (Early Education, supported by DfE, 2012; earlier, and extended, version of the *Early Years Outcomes guide: Development Matters in the Early Years Foundation Stage*), it is still of importance to investigate if rates of pretend play during the second year of life in representative community samples in the UK support these “typical” age boundaries; i.e., do most children in a representative community sample assessed during the second half of the second year show pretend play, or is there still normal variation? Further, if children all have the capacity to show pretend play, do all children necessarily display this capacity during observations of free play in natural settings; are observational methods useful for identifying children’s capacity for pretend play or should parents’ and teachers’ reports also be used?

Between the ages of 22 to 36 months, the guidance materials discussed above encourage early years practitioners to “support children’s symbolic play, recognising that pretending to do something can help a child to express their feelings” (Early Education, supported by DfE, 2012, p. 13). However, as some authors suggest that some children are more fantasy-oriented and engage in more pretend play than other more reality-orientated children (Pierucci, O’Brien, McInnis, Gilpin, & Barber, 2014), it is possible that such strategies that encourage development and learning through pretend play may actually be more suitable (or more successful) with those children more orientated to fantasy and pretend play. However, due to a lack of longitudinal studies on the development of pretend play from infancy to childhood, “little is known about whether individual differences in frequency and complexity are *stable* over age” (Zerwas, 2003, p. 2), especially from around the time of the first birthday; thus, there is uncertainty whether some children do consistently (through time)

engage in more pretend play than others. Investigation of whether individual differences show *stability* over time is a fundamental concept in developmental science (Bornstein, Putnick, & Esposito, 2017), used to evaluate if a characteristic is a stable trait and if measurements are psychometrically meaningful (Bornstein et al., 2017). Therefore, longitudinal investigation of changes and stability in pretend play address fundamental questions in developmental science. To facilitate longitudinal analyses, it is crucial to first reliably identify the earliest forms of pretend play.

1.3 Overview of the Thesis

The next chapter (Chapter 2, Section 1) will begin with a discussion of existing definitions of play and pretend play. While inconsistencies across definitions are often noted (Barton & Wolery, 2008; Barton, Choi, & Mauldin, 2019), and will be discussed, I will investigate where there is consensus around defining and identifying play and pretend play actions within the developmental literature, to inform a working definition of pretend play to use within the current body of work.

Garvey (1977) noted that children often display observable signals and markers during pretend states that can provide evidence of the pretend play occurring (e.g., “moving or gesturing in a manner that contrasts with her normal behaviour”, p. 83). I aim to explore if other authors similarly refer to children using observable signals in play, and pretend play, and explore if such signals are a key component for identifying pretend play in young children, as distinct from other forms of behaviour, especially before children can verbally confirm their pretend play.

I will review previous observational coding schemes used in the measurement of early pretend play, with the aim of investigating if earlier schemes clearly, or fully, operationally define observable signals and markers that help to identify early actions as play, and pretend play in particular. If such observable behavioural signals are crucial to reliable identification

of early pretend play but are absent from previous schemes, there may be issues with the actions that some previous studies have measured as indicating *pretend play*, or *play* in general. The review of definitions in Chapter 2, Section 1, will inform the conceptualisation of pretend play within this thesis and the development of a new observational coding scheme for measuring pretend play (which I will present in later chapters); the new coding system will address gaps identified with previous measurement tools.

Chapter 2, Section 2, will present a review of the earlier literature that reports on rates of pretend play during the toddler years. I aim to describe the nature of the earlier findings, the composition of previous samples studied, and types of data collection previously used. I aim to quantify the earlier findings to derive conclusions about the timing of the emergence of pretend play for the vast majority of children, while investigating if the methodologies used by earlier researchers enable conclusions that are generalisable to general populations. The review of the literature will highlight gaps in the evidence on the emergence of pretend play that the current thesis will aim to address.

Within Chapter 3 I will present the methods of the Cardiff Child Development Study (CCDS), the source of data for all later empirical analyses. I will present details of the nationally representative sample who participated in the CCDS and information about the overall procedures of this six-wave longitudinal study.

Within Chapter 4, I will use data from Wave 4 of the CCDS to explore whether there is almost universal emergence of pretend play in a representative community sample of children during the second year of life (Study 1). I first aim to analyse informant-report data, from up to three informants (including mothers, fathers, and other family members or friends), reporting on children's capacity for pretend play during the toddler period (between 17 and 24 months of age), to investigate the proportion of children reported to show pretend play.

Second, using a new observational coding scheme developed for the study, I will examine video records of free play sessions in the home environment conducted during Wave 4 of the CCDS for instances of pretend play during toddlerhood. The new coding scheme aims to advance on existing schemes used in observational studies of early pretend play by providing comprehensive, and reliable, operational definitions that clearly define observable behavioural signals of play that might accompany children's actions with toy cooking and dining equipment (and other toys) and thus supply clear evidence for engagement in pretend play, as distinct from engagement in other forms of action. From the examination of the video records, I will present new empirical data on the number of children between 17 and 24 months of age, in this nationally representative sample, who demonstrate pretend play during observations of free play in the home environment. Researchers have previously discussed that we have little knowledge about children's play behaviours in natural settings; for example, Kelly-Vance, Ryalls, and Glover (2002) previously noted that "no standards existed for what typical children demonstrate during non-facilitated play sessions" (p. 182) and Barton and colleagues (2019) recently discussed that there is still "limited research on the normative rates of play for young children in natural settings" (p. 14). Therefore, the new empirical data on the rates of pretend play will fill this gap in the literature. Study 1 aims to add to the evidence base on pretend play in the second year of life; the evidence has implications for the measurement of pretend play in developmental assessment instruments and in early education settings.

A further aim of Study 1 is to examine if there is statistical agreement between informants' reports of pretend play and researchers' observations of pretend play. The analysis will be twofold; first, the analysis aims to provide a measure of convergent validity for the newly developed coding scheme, which will be shown if there is statistical agreement across the two measures (Frahsek, Mack, Mack, Pfalz-Blezinger, & Knopf., 2011). Second,

the analysis has relevance to the use of observations of free play in childhood assessments for delays and disorders; if we see a higher proportion of children reported to engage in pretend play by informants, compared to those observed to do so, this could indicate that short, single, observations of free play, in the home or school, may underestimate children's capacity for pretend play.

Within Chapter 5, I will use data from Wave 3 and Wave 5 of the CCDS to conduct a longitudinal analysis of children's pretend play from infancy to early childhood (Study 2). Existing video records of two identical free play sessions conducted in the laboratory during infancy (Wave 3; mean age of 12.8 months) and early childhood (Wave 5; mean age of 33.6 months) will be examined for pretend play using newly developed age-appropriate modules of the new observational coding scheme presented in Study 1. Study 2 will first investigate if *any* of the infants in this community sample, around the time of their first birthday, show pretend play; I will look for clear observable signals for infants engaging in pretend play. In Study 2, I will ask, are there individual differences in displaying pretend play at this point in development?

Longitudinal change in children's displays of pretend play, and the stability of individual differences over time, from infancy to early childhood, will be explored. Previous longitudinal findings on the stability of individual differences from infancy to early childhood are sparse, and inconsistent. In Study 2, I will ask, are displays of pretend play almost universal in the laboratory session during early childhood? Or do some children engage in pretend play consistently (over time) more often than other children?

In both Study 1 and Study 2, the use of the CCDS community sample will enable investigation of whether differences in childhood exposure to social adversity are associated

with children's displays of pretend play; previous findings on associations with family social class status and children's displays of pretend play are inconsistent (McLoyd, 1986).

Chapter 6 will present a general discussion of the findings, implications, and future directions for research. I will discuss the relevance of the findings to the measurement of children's pretend play abilities on developmental screening instruments for delays and disorders during the second year of life, the relevance of the findings to the methods used to assess children's pretend play capacities in both clinical and early education settings, and the relevance of the findings to strategies used to encourage learning and development in early education settings.

Chapter 2.

Section 1.

2.1 Defining, Identifying and Measuring Pretend Play

2.1.1 Defining and Identifying Play

Pretend play has been considered “a subtype of play” (Weisberg, 2015, p. 250) and “the intersection of two broader concepts: play and pretence.” (Lillard 1993. p. 349). Therefore, we need to consider definitions for the general concept of ‘play’ when considering how to define and ultimately measure *pretend* play. However, the difficulty in defining the concept of play is often discussed (e.g., Lillard, 1993; Parham & Primeau, 1997; Power, 2000; Burghardt, 2010; Pellegrini, 2013; Weisberg, 2015).

Some researchers contend that the concept is too vague: “Psychology would do well to give up the category of play” (Berlyne, 1969, p. 843). Berlyne argued that a focus on this generic concept, which refers to a wide range of behaviours with supposedly little commonality, does not lead to precise measurable operational definitions, and therefore the study of narrower categories (i.e., *pretend* play) is a more fruitful avenue of research (Fein, 1981; Power, 2000). Nonetheless, looking at how play has been defined in general is an important exercise when trying to operationalise a concept described as the intersection between *play* and *pretence*. Further, other authors have suggested that in order to facilitate systematic study, definitional consensus about the nature of play is necessary at some level (e.g., Pellegrini, 2013).

Play can be defined “according to the functional disposition with which activities are engaged” (Lillard, 2015, p. 427). For Piaget (1962), the main dispositional characteristic that defines *play* is pleasure. Play, for Piaget, is evident when behaviours are reproduced simply

for pleasure, purely for assimilation rather than accommodation. Such actions, termed *ludic assimilations*, are carried out as a “happy display of known actions” (p. 93). Garvey (1977/1990) extended Piaget’s ideas and provided an inventory of play characteristics that would be critical in any play definition:

- “1. *Play is pleasurable, enjoyable*” (p. 10)
- “2. *Play has no extrinsic goals*” (p. 10)
- “3. *Play is spontaneous and voluntary*” (p. 10)
- “4. *Play involves some active engagement on the part of the player*” (p. 10)

Following the work of Garvey (1977), Rubin, Fein and Vandenberg (1983) synthesised ideas from different theoretical perspectives and listed six factors to distinguish play as a disposition from other types of behaviour:

1. “*Intrinsically motivated*”. Not performed for external rewards or “appetitive drives” (p. 698). Doesn’t have to comply with social demands. Differentiates play from “consummatory behaviour” (p. 698)
2. “*Attention to means rather than ends*”. With self-imposed goals and spontaneous behaviours, free of “means-ends considerations” (p. 698). Differentiates play from “intrinsically motivated activities directed to the attainment of specific goals (enjoyable work)” (p. 698)
3. “*Guided by the organism-dominated question*”. “*What can I do with this object*” rather than, “*what is this object, what can it do*” (p. 699). This occurs when the infant has some familiarity to the object. Differentiates play from “exploratory behaviour” (p. 699)

4. “*Relation to instrumental behaviours*”. “Play behaviours are not serious renditions of the activities they resemble; the individual is not really fighting, but is play fighting”, there is a “non-literal”, “as-if” (p. 699) quality. This is the pretense element that can accompany play. Differentiates play from “sensory-motor activities” (p. 699)
5. “*Freedom from externally imposed rules*”. Differentiates play from “games” (p. 699)
6. “*Actively engaged in an activity*”. Differentiates play from “daydreaming” (p. 699)

It has been suggested there are individual differences in predispositions towards encounters that are playful, and the above criteria provided by Rubin and colleagues (1983) have been used to define “individuals with playful dispositions” as “guided by... a focus on pretence and nonliterality, a freedom from externally imposed rules, and active engagement” (Barnett, 1991, p. 52).

Rubin and colleagues (1983) criteria highlight the importance of differentiating play from exploratory behaviour. It is necessary to rule out behaviours that can be explained by the clear affordances of physical objects and could represent discoveries made during exploration of the physical objects (Hutt, 1970), as opposed to the infant recalling prior knowledge of the objects and situations (this relates to Rubin et al.’s third play factor). Gibson (1979) notes that “affordances of the environment are what it offers the animal” (p. 119); for example, a surface that is “nearly horizontal...nearly flat...and sufficiently extended...if its substance is rigid... *affords support*” (p. 119). *Support* is afforded without the “animal” requiring any prior knowledge, or experience, of the surface.

We can extend these theorists' ideas to free play scenarios with the toy picnic sets and tea-sets often used in the literature on pretend play. The physical properties of a small piece of plastic food *afford* mouthing and chewing on the item; in contrast, holding the plastic food in front of the mouth and making eating sound effects requires prior knowledge of behaviours with food, or even prior knowledge of pretending to eat something. If a child fits a lid on a toy teapot, this may possibly reflect the child's prior knowledge of teapots; however, we cannot be sure that this was not simply a discovery made during exploration of the environment, simply reflecting the fact that lids physically fit on top of containers. This point was previously discussed by Rocissano (1982): "some actions (such as rolling a ball), while typical of adult usage, do not require previous learning from someone else but are quite salient from the properties of the object" (p. 65) . In contrast, turning a teapot, then angling and holding it above a cup indicates prior knowledge about the use of a teapot and is not simply suggested by the immediate sensory properties and affordances of the physical environment. In defining and identifying *play* (and *pretend* play) it is important to be conservative about the inclusion of actions that could simply be exploratory behaviours *afforded* by an object's salient physical features (Haight & Miller, 1993); it is important to exclude actions that are *afforded* by the environment, can be performed without prior knowledge of the object, and therefore are not necessarily representational.

It is important to note that identifying play actions by excluding actions that may be explained by the clear affordances of physical objects and represent discoveries made during exploration of such objects does not mean to imply that the affordances of physical objects play no role in children's play (and *pretend* play). Indeed, in discussing the importance of object affordances in children's pretend play, Szokolsky (2006) has suggested that children's playful re-enactments are often a direct result of the child's perception of the functional properties (i.e., affordances) of objects in the environment (Szokolsky, 2006). To illustrate

this point, Szokolsky recounted an observation of her own child engaging in a play cooking scenario. The cooking scenario began with the child enacting making soup using a pillow as a stove; however, Szokolsky observed that when the child realised (perceived) that the pillow in the scenario *afforded* 'kneading' (i.e., realised that the pillow has the physical properties of being soft and squishable) the child modified their play to be that of making bread instead. Thus, the pretend kneading and pretend bread making action was *afforded* by the physical environment; in Szokolsky's view, the affordances of the object directly modified the play actions and this "knead-able" (p. 68) affordance would be available without prior knowledge of what pillows are made for (Szokolsky, 2006). However, the action does require prior knowledge. The child in this example was bringing prior knowledge to the situation, knowledge of bread or bread making, and this was evident because crucially the child also accompanied this action with the statement 'I am making bread' (Szokolsky, 2006, p. 67). Szokolsky also specifically noted that the child had engaged in this activity previously "baking bread was an activity in which he had previously participated" (p. 68). Therefore, while the pretend play action was *afforded* by the object in the environment, the play was only really observable because the verbal statement indicated there was also an 'as if', non-literal element (Rubin et al., 1983), or a bringing of some element of prior knowledge; not simply that the child was engaging solely with the literal physical reality (the physical affordances, i.e., soft and 'knead-able') of the pillow. Without the verbal statement, the pretend/play 'kneading' action could be observed simply as the child performing an exploratory, sensory, action *afforded* solely by the soft, squish-ability of the pillow, the child may have been simply exploring how it feels to squish the pillow, without bringing any 'as if', non-literal play quality, without bringing a prior memory or knowledge to the action; simply exploring "*what is this object, what can it do*" (Rubin et al.'s, 1983 third play criteria used to differentiate play from exploratory behaviours, p. 699). The 'kneading' action,

without the speech, could simply represent a discovery made during exploration of the object without the child bringing any prior knowledge to the situation.

To further illustrate this point, we can take Rocissano's (1982) example of rolling a ball described above. We could think of an example where a child pushes a ball, the round shape *affords* rolling and this affordance modifies the child's play to be for example that of pretending to roll up snow to make a snowman. While the object in this instance *affords* the new pretend play action, as an observer, without some verbal indication of such a pretend intention, observably, the child pushing the ball could only be viewed conservatively as the child performing an action that has required no prior knowledge and has occurred only because of the perceived salient physical features of the object (the ball rolls, so the child discovers they can push it; "*what is this object, what can it do*", Rubin et al., 1983, p. 699); there would be no evidence of pretend transformation or play. In an absence of clear additional evidence of play (e.g., a verbal signal) it is important to be conservative about the inclusion of actions that could simply be exploratory behaviours afforded by an object's salient physical features (Haight & Miller, 1993) as forms of play (and pretend play).

Earlier definitions of play are useful for distinguishing play from other forms of behaviour and more recent criteria for recognising play further defines key observable elements³. Burghardt (2010) provided the following list, and noted that all five of these criteria must be met to define a behaviour as *play*:

1. The performance of the behavior is not fully functional in the form or context in which it is (p. 14) expressed; that is, it includes elements, or is directed toward stimuli, that do not contribute to current survival...

³ The play definitions covered here are not exhaustive, refer to Burghardt (2010); Pellegrini (2013); Lillard (2015) and others for further approaches to defining play. It is not within the scope of this thesis to review all definitions of play.

2. The behavior is spontaneous, voluntary, intentional, pleasurable, rewarding, reinforcing, or autotelic (“done for its own sake”) ... Crucially “Only ONE of these often overlapping concepts needs to apply” ...
 3. It differs from strictly functional expressions of behavior structurally or temporally in at least one respect: incomplete (generally through inhibited or dropped final elements), exaggerated, awkward, precocious, or involves behavior patterns with modified form, sequencing, or targeting...
 4. The behavior is performed repeatedly in a similar, but not rigidly stereotyped, form during at least a portion of the animal’s ontogeny...
 5. The behavior is initiated when an animal is adequately fed, clothed, healthy, and not under stress (e.g., from physical danger, harsh weather, illness, social instability, family dysfunction), or intense competing systems (e.g., feeding, mating, competition, fear): In other words, the animal is in a “relaxed field.”
- (pp. 8-12)

2.1.2 Defining and Identifying Children’s Pretend Play

Moving towards specifically defining *pretend* play, researchers have used the *play* criteria above to define pretend *play* as non-instrumental; having enjoyment as the only immediate goal (Weisberg, 2015); and being performed not for survival, but for fun (Lillard, 1993). The criteria have then been extended to define the *pretend* elements specifically. The non-literal, “as if,” pretence element that was suggested to differentiate play from “sensory-motor activities” by Rubin and colleagues (1983, p. 699) is prominent in definitions of pretend play, e.g., the child *pretends* to drink, rather than performing literal drinking, and acts in a manner that is distinct from reality (i.e., there is no liquid but acts *as if* drinking).

Lillard (1993) provided a list of five features that are needed to classify an act as specifically *pretend* play, with a focus on differentiation from reality and the literal environment:

1. *A pretender*
2. *A reality (obviously omnipresent)*
3. *A mental representation that is different from reality (“an idea” Lillard, 2001, p. 2)*
4. *A layering of the representation over the reality, such that they exist within the same space and time*
5. *Awareness on the part of the pretender of components 2, 3, and 4.* (p. 349)

A “working definition” of *pretend* play that encompasses both the pretend and play elements was additionally provided by Lillard (1993): “The projecting of a supposed situation onto an actual one, in the spirit of fun rather than for survival.” (Lillard, 1993, p. 349) and in later work, “pretend play occurs when a child treats one situation or object *as if* [emphasis added] it were a different one, in a spirit of fun” (Lillard & Kavanaugh, 2014, p. 1537).

Definitions of pretend play provided by other psychologists similarly focus on the conceptual idea of transformations of the literal environment with awareness; however, the following definitions make less reference to the specific cognitive processes occurring during pretend play (i.e., possible mental representations) and instead, mainly define observable behaviour and actions:

1. “Voluntary transformation of the Here and Now, the You and Me, and the This and That” (Garvey, 1977, p. 82)
2. “Behaviour in a simulative, nonliteral, or as if mode” (Fein, 1981, p. 1096)

3. “Acting as if something is the case when it is not” (Rutherford, Young, Hepburn, & Rogers, 2007, p. 1025)
4. “A form of playful behavior that involves nonliteral action”; “Acting-as-if” (Weisberg, 2015, p. 249; p. 250)
5. “A subcategory of play in which actions, objects, persons, places, or other aspects of the here and now are transformed or treated nonliterally” (Haight & Miller, 1993, p. 20)
6. “Objects or situations are used or performed in a way that does not exist in the immediate reality” (Orr & Geva, 2015, p. 147)
7. “The non-literal transformation of the here-and-now whereby the infant or child, in the context of a play sequence, treats the world contrary to reality” (Neilsen & Dissyanke, 2004, p. 343).

Such “as-if”; “non-literal play” and transformational definitions are noted to be common in the developmental literature (Rutherford et al., 2007, p. 1025); therefore, the current body of work will broadly follow these conceptualisations of pretend *play*. How can we identify that a child is performing a nonliteral, pretend play act?

The awareness of the pretend play act noted by Lillard (1993), and others was earlier suggested by Piaget (1962) as a key feature in labelling an act as make-believe. It was Piaget’s view that towards the end of the sensory-motor stage, play develops towards a display of *ludic symbols* where the child rather than simply reproducing behaviours and “following the cycle of his habitual movements” (p. 93) shows an *awareness* of the make-believe reproduction when they “pretend” at an action. For example, children “pretend to” “sleep” or “eat” (i.e., a non-literal enactment of sleeping, or eating) (p. 120). In observations of his own children, Piaget noted that ludic elements, i.e., playful behaviours, accompanied make-believe actions, e.g., smiling, laughter, sound effects, speech and exaggerated actions

(e.g., repeated blinking) and such ludic elements accompanying an act may show the child's awareness of the pretend act (or taking a more conservative view, they at least show the action is playful, i.e., performed for pleasure).

Garvey (1977) discussed the idea that "play is a non-literal orientation and playful behaviour reflects that orientation" (p. 13). Thus, indicators and signals of playful behaviour, such as the ludic elements noted by Piaget, may signpost the performance of a non-literal (pretend) enactment (i.e., playful, not literal, *drinking, fighting etc.*). Indeed, Garvey (1977) noted that *pretending* signals can be used as indicators to children engaging in voluntary transformations of the literal environment (i.e., pretending). Signals such as modified speech, or gestures and movements in contrast to what might be expected, often occur at the beginning of pretending (Garvey, 1977), for example, a child speaks, 'I'm going to be a snail' in a *modified* high pitched voice and commences sliding along the floor in an *exaggerated* manner, or holds a piece of play food *in front* of their mouth and performs *exaggerated* chewing motions towards, but not touching, the play food.

Research with nonhuman animals has referenced similar observable elements possibly signalling *play*. Conducting observations of monkeys, Bateson (1955) noted that "play, could only occur if" ... there are "exchanging signals which would carry the message "this is play." (1955, p. 68). Investigating such signals, Bekoff (1974) researched the play behaviours of dogs and coyotes and noted the use of various play signals performed by the dogs: gestures and posture changes (e.g., approaching in *exaggerated* manner; *quick* bows; *repeated* leaps; *extension* of paws); vocalisations (e.g., barking; with, or following another play signal). An infant performing exaggerated (i.e., playful) actions (e.g., exaggerated chewing motions with play food near their mouth; tilting their heads fully back while holding a cup at the mouth) may be similar to animals engaging in nips rather than bites and animals adopting postures that act as signals that they are within a play frame (Weisberg, 2015), such as the dog's quick

bows, or repeated leaps (Bekoff, 1974). Such exaggerated motions signify that the behaviour within the play frame is not serious (Weisberg, 2015), i.e., is signalling a nonliteral behaviour.

These playful elements (e.g., exaggerated movements) have similarly been referred to by other authors in helping to identify an act as pretend play, especially at ages before a child can verbally indicate the intention to engage in pretend play. Previous behavioural theorists have suggested that exaggerated actions in play signal “that the pretence game is being played” (Stich & Tarzia, 2015, p. 143) and some previous authors have referred to similar behavioural features on observational coding schemes used for identifying pretend play. Belsky and Most (1981), referred to “confirming evidence” such as “drinking sounds”; “tilts”; “tip”; “noises” (p. 632) to distinguish pretend play from earlier play behaviours such as *Enactive naming* and from *Functional-relational play* (e.g., cup to mouth; phone to ear). McCune (1995) noted that for a child to be identified as engaging in early pretend play, rather than a different form of play, exaggerated gestures (e.g., “throwing head back to drink deeply”, p. 199), facial expressions and sound effects should be observed as indicating the child’s awareness of the pretend element of the action. The elaborated gesture (full rotation, or head tilted fully back) may indicate the child is referring to an absent past (McCune, 1993) e.g., a memory of drinking, rather than just guided by the physical environment. Similarly, Nielsen and Dissyanke (2004) followed McCune’s ideas and scored children as “drinking” from an empty cup when exaggerated gestures or sound effects were shown by the children; noting that the exaggerated gestures and sound effects “suggested an awareness of the differentiation of the literal and pretend behaviours” (p. 347). Vig (2007) also suggested “exaggerated movements suggest awareness of pretence” (p. 204). Thus, the presence of certain behavioural exaggerations (e.g., exaggerated tilting of a cup; exaggerated mouth movements; sound effects) appear to be a key element in identifying if an infant is engaging

in play, and in particular, pretend play. The presence of a smile has also been noted as an identifying behavioural element accompanying pretend play and an indication of pretend play (e.g., Piaget, 1962; McCune, 1995); however, other authors have questioned whether a smile alone is adequate evidence that play, or pretend play, has occurred (Huttenlocher & Higgins, 1978).

These ‘pretending signals’, e.g., exaggerated movements and gestures, used by other authors to identify pretence may satisfy many of the above criteria for engagement in play:

1. They indicate the behaviour does not contribute to survival (e.g., there is no liquid in a cup, yet the child performs an exaggerated tilt of the empty cup; the play food is not edible, yet the child continues to perform exaggerated chewing motions).

2. The signals indicate that the child has entered into the play frame and is performing non-serious actions (i.e., for fun; for pleasure) (Weisberg, 2015).

3. They distinguish a playful act from exploratory behaviours (i.e., the infant is exploring “what I can do with this object”, not “what it can do” [Rubin et al., 1983, p. 699], and thus is not focused on just immediate sensory properties but is drawing on prior experience with such objects.

4. Signs of playful behaviour (e.g., exaggerations, sound effects) reflect the actions are of a non-literal orientation (Garvey 1977; Rubin et al., 1983).

5. The child using exaggerated gestures and sound effects fits Burghardt’s (2010) criteria that play is “incomplete...exaggerated, awkward, precocious, or involves behavior patterns with modified form, sequencing, or targeting” (p. 10).

6. Exaggeration also implies that the child is not simply enacting a learned association, such as cups go to mouths, and show the child is actively engaged.

Lillard (2015) noted that actions such as the “child feeding a doll with a spoon” are difficult to discern conclusively as pretend play as “when a child puts a spoon to a toy duck’s mouth the child might be pretending to feed the duck, or might be demonstrating a prominent location goal for a spoon.” (p. 427). Similar issues arise when a child presents a piece of plastic food, or cup, to their mother’s mouth. In such examples there is not enough evidence of the action being a non-literal enactment, i.e., there is no evidence of non-literal *pretend* “feeding”. However, if elaborated and exaggerated signals are observed, e.g., the child *tilts* the spoon at their mothers’ mouth, or vocalises sound effects, then we have evidence (observable signals) for the child enacting a playful action. There is no food, so the child is not literally feeding their mother and the tilts and sound effects provide support that we are observing *playful* ‘feeding’; the playful and pretending signals show that the orientation of the child is non-serious (for fun) and non-literal (Garvey, 1977) and suggest that the child is recalling a memory of “feeding” or “offering” (as suggested by McCune, 1993).

As noted, after infancy, a key signal of a child engaging in playful, non-literal behaviour is of course speech (Garvey, 1990). For example, as the child lifts a cup to mouth and says, ‘I’m drinking a nice cup of hot tea’, the speech demonstrates the child engaging in playful, non-literal drinking. In the same way that actions can be exaggerated, an “exaggerated tone of voice” provides further evidence of a playful, non-literal orientation, especially in cases where the content of the speech is ambiguous as to whether the child is pretending (Howe, Petrakos & Rinaldi, 1998, p. 186).

2.1.3 What Types of Actions and Activities Have Been Considered to be Pretend Play (Fitting the Conceptualisations of Pretend Play As ‘Non-Literal’, ‘As If’; Transformational *Play*)?

2.1.3.1 Pretending at familiar actions (pretend enactments directed towards the child’s own body, objects, and others). Piaget claimed that the most basic form of the ludic

symbol (“the symbolic schema”) was a “reproduction of a sensory-motor schema outside its context and in the absence of its usual objective” (p. 119), where the child would “pretend to be doing one of his usual actions” (p. 120). Actions such as pretending to sleep; pretending to eat; pretending to offer were noted to be examples of this type of behaviour. In Piaget’s observations of his own children, he noted Child L. “pretending to drink out of an empty box” (p. 97) as indicating existence of early make believe play (the substitute box was a key element here) and this was prepared for by “playing at drinking out of empty glasses and then repeating the action making noises with lips and throat” (the sound effects and repetition are key elements here) (p. 97).

Lillard (2015) summarised Piaget’s observation as the child “ritualistically *pretend-drinking* out of empty cups and making drinking noises with her mouth” (p. 428). Thus, a child playfully drinking out of context, with an absence of liquid, has been considered as a form of pretend play (i.e., fitting the conceptualisation of *pretend play* as a form of non-literal activity, i.e., a nonliteral enactment of drinking, indicated by the sound effects signalling playful drinking). Piaget discussed that when an action was “a reproduction of itself” in a “different context” (p. 101) this could be referred to as “the symbol in action without representation (p. 112); the actions were “played” and “for fun” and were likely “preparation for representational symbols” or preparation for “properly symbolic schema”. When actions were “not only taken out of ordinary context and left uncompleted” (e.g., not dinner time; not bedtime) ... and “applied to new and inadequate objects” they become “entirely make-believe” (p. 101).

Hill and McCune-Nicolich (1981), following Piaget’s ideas, similarly noted that “pretending is inferred on the basis that actions are performed outside their normal context with inadequate materials (e.g., empty cup for drinking)” (p. 613), and further in later work, by the child using what McCune (in 1995) refers to as “elaborations such as sound effects,

affect, and gesture” (p. 206) (i.e., the pretending signals discussed previously). Likewise, Bijvoet-van den Berg and Hoicka (2019) referred to “drinking from empty cup” (p. 314) as an example of an action that was “technically incorrect” (“technically incorrect” was how the authors defined pretend play, p. 314); the *empty* cup is incorrect and inadequate for drinking. Pretending to drink from an empty cup, pretending to eat from an empty spoon, and other pretend actions directed towards the child’s own body, or recreating their own behaviour (often labelled by previous authors as pretend actions *directed towards self*; *self-directed* pretend actions; *self-pretend* actions) have been included on numerous observational coding schemes devised to measure pretend play in free play sessions (e.g., Nicolich, 1977; Fenson, 1978; Belsky & Most, 1981; Hill & McCune-Nicolich, 1981; Tamis-Lemonda & Bornstein, 1991; Ogura, 1991; McCune, 1995; Lillard & Kavanaugh, 2014; and Others).

Researchers have also identified non-literal enactments away from the child’s body, directed towards objects, and towards peers, parents and inanimate objects (often referred to as *pretend other* actions; *other-pretend* actions; *decentred symbolic play*; *object-directed acts*) as another form of pretend play. Piaget (1962) noted an example where Child J. “took a spoon and fed her doll, digging the spoon into an empty bowl (p. 122)” as an example of the category of behaviours termed *projection of symbolic schema on to new objects*, with the child enacting the feeding schema now on the new object, the doll. Other actions using toy tea-sets and toy picnic sets, such as pretending to stir a spoon in an empty cup; pretending to spoon from one container to another; pretending to feed the parent from an empty spoon; pretending to pour liquid into mother’s cup have been included on various measurement schemes of pretend play in free play sessions (e.g., Nicolich, 1977; Fenson, 1978; Belsky & Most, 1981; Fenson, 1984; Ogura, 1991; McCune, 1995; Lillard & Kavanaugh, 2014, and many others).

2.1.3.1.1 Pretend play vs. functional play: alternative conceptualisations of actions carried out with miniature toy replicas. While enactments such as *drinking* from an empty toy cup, *feeding* a doll from an empty toy spoon and *pouring* from a toy pot to a toy cup, noted above, are often considered as examples of early pretend play (Rutherford et al., 2007; Frahsek et al., 2010), such actions with miniature replicas have sometimes been labelled as *functional play* (e.g., Ungerer & Sigman, 1981; Zelazo & Kearsley, 1980; Laplante, Zelazo, Brunet & King, 2007) and viewed as a simpler form of play theoretically distinct from pretend play (or symbolic play). Functional play has been defined as involving “the appropriate use of an object or the conventional association of two or more objects” (Ungerer & Sigman, 1981, p. 320), as the child “using the objects 'appropriately', that is, according to their intended function” (Baron-Cohen, 1987, p. 142); “involving the appropriate adult-defined usage of toys” (Laplante et al., 2007, p. 70) and involves “prior knowledge of an objects functions” (Zelazo & Kearsley, 1980, p. 113).

The distinction between functional play and pretend play has been made by some researchers, often working in the domain of autism research, who define pretend play using a different set of criteria to the classic definitions noted earlier in this chapter (i.e., the earlier definitions of pretend play as observably non-literal, as if, play, Rutherford et al., 2007). These researchers instead rely on cognitive criteria to identify pretend play. For example, Leslie (1987; with similar definitions also provided by Baron-Cohen, 1987) stated that actions meet the criteria for *pretend play* if one of three things have occurred *cognitively*:

1. “Object substitution”, “Has one object been made to stand in for another, different object?”
2. “Attribution of pretend properties”, “Has a pretend property been attributed to an object or a situation?”

3. “Imaginary objects”, “Has the child invented an imaginary object?” (Leslie, 1987; p. 414).

For Leslie, and others following this research tradition, if there is no evidence of the child *cognitively* engaging in these three specific forms of pretence, there is no reason to assume the child is engaging in pretend play. Consequently, if the child is maybe “simply demonstrating knowledge of the conventional use of objects” (p. 413), actions are instead considered as functional play, or “sophisticated functional play” (Leslie, 1987, p. 414) and excluded from pretend (or symbolic⁴) play (Rutherford & Rogers, 2003). Therefore, some actions with miniature replicas such as cups and spoons and play food have been categorised as the child simply showing conventional knowledge of an object and labelled as functional play (e.g., Zelazo & Kearsely, 1980; Ungerer & Sigman, 1981; Laplante et al., 2007).

In pretend play, Leslie noted, there should be an “as if” *cognition* on the part of the observer *and* actor (Leslie, 1987). For Leslie (1987), in functional play (and also where the child is “acting in error”, p. 413) there may only be an “as if” *action* observed. For example, a researcher may observe a child appearing to behave as if there was liquid in a cup when the child lifts the cup to mouth and tilts their head back, and therefore observe a non-serious, non-literal ‘drink’; however, from the actor’s view (i.e., the child) “the actions are serious” (p. 414). The child may simply see the cup as a real, albeit smaller, version of an object (e.g., a real drinking cup; Baron-Cohen, 1987), may be “acting in error” (Leslie, 1987, p. 413) or confused or mistaken (Baron-Cohen, 1987) and the “as if” element is therefore only on the part of the observer. The child may simply be demonstrating conventional use of an object (Huttenlocher & Higgins, 1978; Leslie, 1987), or have “learnt” how to appropriately ‘play’

⁴ In line with Baron-Cohen (1987), which noted that “‘symbolic play’ and ‘pretend play’ are coterminous” (p. 139), this body of work will use the term ‘pretend play’ where previous authors have used the term ‘symbolic play’.

with the miniature object (Huttenlocher & Higgins, 1978; Jarrold, 2003) and be simply demonstrating conceptual and conventional knowledge of a cup, or toy cup (Lewis et al., 2000) but not necessarily symbolising, or cognitively imagining, that the empty cup symbolises/represents/contains/has been attributed with real liquid; therefore, the action is categorised as functional play. Therefore, with a lack of evidence of “as if” thinking on the child’s part, some authors caution against considering nonverbal (in the most part) actions with miniature replicas as pretend play (Baron-Cohen, 1987). In this perspective, for “true” pretending to have conclusively occurred, the child must perceive the actual situation correctly (e.g., wood as wood; empty toy cup as empty toy cup), and then be “telling the difference” (Leslie, 1987, p. 413) with the modified pretend enactment (e.g., transforming or substituting the wood to soap; transforming or substituting the empty toy cup to containing imaginary liquid) (Leslie, 1987).

It has been noted by some authors that without an advance verbal announcement of the child’s intentions to pretend, it is difficult to ascertain whether such cognitive processes have occurred (i.e., cognitively representing the current and absent scenarios correctly, Huttenlocher & Higgins, 1978). Even with accompanying sound effects and behavioural exaggerations, some authors believe that such behavioural features only show that the child is demonstrating conventional (“sophisticated” Leslie, 1987, p. 414) knowledge of the object (Huttenlocher & Higgins, 1978; Leslie, 1987); the child may have “learnt” how to play with the toy appropriately, without having cognitive awareness of any pretend element (Jarrold, 2003). These more stringent criteria imply that only verbal children can engage in pretend play; this is a problem for research carried out with non-verbal infants and these cognitive criteria may overestimate the timing for the onset of pretend play. Furthermore, within this research tradition, at what point does the child move into the pretend realm? Even when a child verbally refers to absent food on a spoon or states an intention to feed an adult, those

actions could presumably still be considered as showing conventional use (or adult-defined use) of the object (Laplante et al., 2007). Thus, within this tradition, there are some problematic issues with distinguishing between functional and (symbolic) pretend acts.

Leslie's and others' theoretical separation of functional play from more sophisticated pretend play represented a departure from previous assumptions on the development of play behaviours. Previous theories suggest a gradual developmental progression of play behaviours, from simple to more elaborate forms (Williams et al., 2001), e.g., from behaviours such as 'drinking' from an empty toy cup to later imagining a cup and creating imaginary liquid. However, Leslie instead argued that pretend play requires different cognitive architecture to 'sophisticated functional play' behaviours. Functional play behaviours are not seen as early forms, or precursors, of 'true' pretend play; for Leslie, a different internal mental representation system underlies functional play actions. For Leslie, once the cognitive ability to engage in pretence emerges it does not develop further (Leslie, 1987).

In contrast, other authors who use the functional play category view the relationship between functional play and pretend more "as building developmentally on one another" (Lyn, 2006, p. 202) and suggest that functional play is an early manifestation, or precursor, of symbolic play (Ungerer & Sigman, 1981), thus viewing a less "qualitative distinction between functional and symbolic play" (Williams et al., 2001, p. 68). These latter views appear more in line with Piaget's theorising about play; Piaget viewed early simple "symbolic schema" as "merely a make believe reproduction of the child's own action" (i.e., as in the case of pretending to drink) and noted "that these 'symbolic schema' mark the transition between practice play and symbolic play proper" (p. 120; symbolic play proper being for example substituting one object for another). Piaget noted that "'symbolic schema' is already symbolic play" ... although "it is only a primitive form" (p. 120).

Seemingly in line with these ideas, an alternative research tradition (again common among researchers in the domain of autism research) considers some types of *functional* play to be a subtype of *pretend play*, arguing that the umbrella term, *pretend play* includes simple pretend actions (e.g., Lewis & Boucher, 1988; Lewis & Boucher, 1997; Libby, Powell, Messer, & Jordan., 1998; Baranek et al., 2005; Kasari, Freeman, & Paparella, 2006; Barton, 2010). Some authors specifically include a category labelled *functional play with pretence* (e.g. Barton, 2007; 2010) in their measurement of pretend play. Other types of pretend play (e.g. *symbolic play; object substitution; attribution of pretend properties; imaginary objects*) are then viewed as more advanced types of pretend play (with the more advanced types often identified using the three criteria provided by Leslie, 1987; Baron-Cohen, 1987; Ungerer & Sigman, 1981, noted above). Therefore, within this research tradition, the playful actions towards self, objects, and others with miniature replicas, such as the child bringing an empty cup to mouth to drink; stirring a spoon in cup and feeding a doll, have been defined as functional play, but also simultaneously as early simple pretend actions that are less cognitively advanced than other forms of pretend play (e.g., Kasari et al., 2006; Barton 2007; 2010). In this perspective, while such enactments may emerge earlier in development than other forms of pretend play e.g., *role play*, the actions can be considered as valid indicators of pretend play.

It is evident that some authors do not explicitly label these types of actions as pretend play within their observational coding schemes used for measuring play actions but do still appear to consider some functional play enactments as types of early pretend play. For example, Williams and colleagues (2001) categorised play behaviours into two subcategories: *simple functional play* acts and *elaborated functional play* acts, which were suggested to follow a developmental progression. The elaborated functional play category included *functional acts supported by appropriate vocalization/gesture*, (“exaggerated gesture”, p. 71)

e.g., “placing a toy telephone to the ear and vocalizing, making slurping noises while drinking from a baby bottle, drinking from a cup and throwing head back in an exaggerated drinking gesture” (p. 71). While these playful behaviours were not labelled as pretend play within the coding scheme, these elaborated functional play acts appear to be viewed under the pretend play umbrella term; the authors suggested that early pretend play involves reproducing functional acts in play and later elaborating the acts, i.e., fitting the operational definition of this elaborated functional play category (Williams et al., 2001).

As with the more stringent cognitive tradition (e.g., Leslie, 1987), there are some issues with how actions are separated into the different categories of functional pretend play and more advanced types of pretend play. For example, while Barton (2010) included the action “stirring a spoon in a toy pan” as an example of *Functional play with Pretence* (defined as “nonliteral use of actual or miniature objects” ... ⁵ p. 253), Barton also noted “I’m making soup” as an example of a “vocalizations identifying or confirming functional play with pretence behaviors” (p. 253); however, this example could alternatively fit the authors’ pretend play category of *imagining absent objects* (defined as “performing an action as if an object was present in the object’s absence”, p. 253). Indeed, in a different version of the authors’ coding scheme the example “puts bottle over cup and says milk” was provided as the child *imagining absent objects* (Barton, 2007, p. 122). We cannot ever really know if a child is ‘imagining’ in either of these examples. We can however *observe* the enactment of a non-literal activity (non-literal pouring/stirring/cooking) in the three examples listed above; if there is behavioural evidence the stirring is not simply the child combining objects, without the need to relegate the first enactment to a lower form of pretend play (especially if the goal of a study is to investigate the early development of *any* pretend play). The children may

⁵ “Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome” (p. 253)

simply be signalling their pretend play differently; with the non-literal stirring signalled by action (possibly an elaborated rotation of the spoon) and the non-literal pouring signalled verbally (i.e., ‘milk’).

The use of a distinction between functional play and ‘true’ pretend play appears more common in autism research than other developmental research on typically developing children (also noted by Rutherford et al., 2007). Often in developmental research on typically developing children, the more behavioural ‘as-if’, non-literal *play* definitions (those provided by Fein, 1981; Haight & Miller, 1993) are used often without the inclusion of a separate category for including functional play or functional pretend play (also noted by Rutherford et al., 2007). However, it is important to note that while a separate category for functional play is evident in autism research, often the instruments used for the early screening of autism appear to include measurement of the actions possibly considered as so-called functional play as indicators of pretend play. For example, as part of Modified Checklist for Autism in Toddlers, Revised, with Follow-Up (M-CHAT R/F; Robins, Fein & Barton, 2009), caregivers are asked to report on the item, “Does your child play pretend or make-believe? (FOR EXAMPLE, pretend to drink from an empty cup, pretend to talk on a phone, or pretend to feed a doll or stuffed animal?)” (p. 3); it is likely that the informants report on nonverbal enactments of these actions.

Therefore, across many research traditions, although certainly not across all, such early enactments towards self, objects and others with miniature replicas are considered as examples of pretend play. If these actions are to qualify as non-literal, ‘as if’ *play*, it is important to ensure the actions are distinct from exploration and not afforded by the physical properties of the play objects. As Haight and Miller noted, “actions suggested by salient physical properties...were ambiguous as to whether the child was treating the object nonliterally” and excluded, e.g., “placing a toy biscuit in a toy bowl” (p. 20); “held a doll”;

“pushed toy car” (p. 136). Some actions exemplified on coding schemes that measure functional *play* are hard to distinguish from exploratory behaviours, and therefore also difficult to categorise as play (*play* being defined by Rubin et al., 1983 e.g., “*guided by the organism-dominated question, “what can I do with this object”* rather than, “*what is this object, what can it do*, p. 699, i.e., relying on prior knowledge). While many of the actions cited as examples of functional play indicate that the child recognises the functions of an object and thus demonstrate prior knowledge (i.e., speaking into a toy telephone requires knowledge that telephones are used for speaking into and using a spoon for feeding requires prior knowledge that a spoon is for feeding; rather than the child exploring “what is this object, what can it do”), other actions cited as examples of functional play could be discovered simply during exploration of the objects and are afforded by the object’s physical properties. Actions such as “Opening cooker doors”; “Placing a teacup on a saucer”; “Placing the top on the teapot”; “Turning dials on a cooker” and “Push truck” feature on coding schemes that measure functional play (e.g., Ungerer & Sigman, 1981; Zelazo & Kearsley, 1980; Baron-Cohen, 1987). In line with Gibson’s (1979) ideas on affordances, it could be considered that the physical properties of the cooker door *afford* opening; without any previous knowledge that cooker doors open being required. Similarly, a dial on a toy cooker is limited to the action of turning, and the movement of a car on wheels could be discovered during exploration. Therefore, it is debatable whether such actions meet definitions of ‘play’ per se, when considering Rubin et al.’s (1983) criteria for play as distinct from exploration (see p. 13).

Other authors have similarly questioned whether some items on early coding schemes used to measure functional play are clearly measuring the “appropriate use of an object” (Williams et al., 2001, p. 69). It is important that non-verbal early enactments towards self,

objects, and others, with miniature replicas meet criteria for play. Some examples of functional play may not qualify as play at all.

2.1.3.2 Object substitution. While there is debate about the inclusion of actions with miniature replicas as forms of pretend play, it is widely accepted that *object substitution* is a valid measure of children's pretend play across all research traditions (Baron-Cohen, 1987) and fits conceptualisations of pretend play as non-literal, 'as if', transformational activity; "one substitutes an object or action which, in a *literal* sense, is wrong" (Hoicka & Gattis, 2008, p. 181). Such actions are generally considered to occur later in development than pretending at familiar actions with replica toys (Fein, 1975; Lillard, 2015), with previous research showing that object substitutions rarely emerge before 19 months of age (Rubin et al., 1983; Lillard, 2015). However, a recent study of children who were predicted to have high IQs at a later time point showed that most children substituted one object for another around 11 to 13 months of age (Morrissey, 2014). Piaget (1962) noted that pretence was clearly observable in play when the child used an "inadequate object" to evoke, or mime, a schema (e.g., miming a drinking schema using a shell) and performed this activity for pleasure (p. 97). In Piaget's observations at 1 year and 8 months old, Child J. "saw a shell and said "cup" ... and pretended to drink" (p. 124) and at the age of 2 years and 1 month, J. then "put a shell on her first finger and said thimble" (p. 124). Piaget referred to such actions as *simple identification of one object with another*. Body parts can also be substituted for objects that are not present; for example Overton and Jackson (1973) investigated such actions as children pretending "to brush their teeth by using a finger as a toothbrush" (p. 309).

The ability to perform object substitutions is considered a milestone in development. The *Early Learning Outcomes* document (DfE, 2013; see Chapter 1) used for assessments of development in Early Years education settings (England, UK) notes that children between 16 to 26 months should "pretend that one object represents another, especially when objects

have characteristics in common” (p. 32). However, a study on free play behaviours in natural settings found that the frequency of object substitutions shown spontaneously by two-year-old and three-year-old children was actually low and spontaneous demonstrations of the behaviour were rare (e.g., Kelly-Vance et al., 2002).

Operational definitions for identifying object substitutions differ among researchers in terms of the requirement of accompanying verbal evidence. McCune (1995) noted that when “one object is substituted for another” there must be “evidence that the child is aware of the multiple meanings expressed” (p. 206). Similarly, Charman and Baron-Cohen (1997) noted a “confirmatory vocalisation” (p. 328), such as naming the new use, or using sound effects, had to be present to identify novel object substitutions. It has been suggested that a verbal announcement before a play action is the clearest evidence of the child being aware of such multiple meanings and indicates the child “knows the object’s name and is not simply referring to the object as best he can” (Huttenlocher & Higgins, 1978, p. 124). Examples of such verbal announcements before a play act include: The child speaks, “car garage” and then moves a block with sound effect “brmm” (Huttenlocher & Higgins, 1978, p. 124); “child picks up play screwdriver, says toothbrush” and “makes the motions of toothbrushing” (Nicolich, 1977, p. 94); “stating and acting as if a banana is a saxophone” (Lillard & Kavanaugh, 2014, p. 1539).

Object substitutions are identified by other authors by action alone, or with no specific mention of verbal evidence being required. Pretend play definitions used by Baron-Cohen (1987, and others) refer to a child “using an object *as if* it were another object” (p. 142); or “the use of one object as if it were a different object” (Ungerer & Sigman, 1981, p. 324). Similarly, Rutherford and colleagues (2007) note that in “pretend play object substitution (the child pretends that some object stands for another object)” (p. 1025), without a specific mention of verbal evidence. Baron-Cohen (1987) included actions such as stirring a *sponge* in

a pan (the sponge acting as a substitute of food); and feeding a doll with a sponge, as examples of this type of pretend play. Here, the *action* (e.g., *stirring; feeding*) indicates the miming of a familiar schema with a new object, without the need for verbal evidence of the substitution. Nielsen and Dissanayake (2000) similarly stated that *Object Substitutions* could be identified if the child “used an object in a manner other than its normal use (e.g., used a cup as a telephone)” or “designated an object as being another (e.g. picked up a pencil and said, ‘This is a dagger’)” (p. 615). If no verbal evidence of the substitution is present, it must be clearly observed that the child is performing a non-literal enactment of an activity (with a substitute object), and not simply engaging in exploratory behaviour (i.e., simply *afforded* by the object); the evidence of the non-literal enactment can provide evidence of the object substitution. For example, Baron-Cohen (1987) include a child “putting a sponge in a pan” (p. 142) as an example of *using an object as if it were another object*; however, here we have no evidence of the child performing a non-literal play behaviour. The child may have simply discovered that the sponge fits in the pan during exploration of the toys, rather than enacting ‘cooking’ and substituting the sponge as food; therefore, the action is not clearly observable as play, and thus the sponge is not clearly observable as substitute food. To clearly identify a playful object substitution, a verbal designation of the object as another, or the child using an object *as if* it were a different object with clear evidence of a pretend action being performed is needed; however, purely verbal operational definitions may underestimate children’s abilities.

2.1.3.3 Verbal pretend play enactments. As noted, speech can be used as a signal that children are displaying a playful, non-literal, orientation and engaged in pretend play (Garvey, 1977; Howe et al., 1998). The use of speech to identify pretend play is evident across different research traditions; as with *object substitutions*, verbal pretend play enactments are widely considered a valid indicator of pretend play.

Verbal enactments can support and confirm the meaning of other actions that are ambiguous as forms of pretend play. For example, Haight and Miller (1993) note “putting a cup up to a doll’s mouth and saying, ‘mm good’” (p. 20) as an example of pretend play. In this instance, the cup to the doll’s mouth is not adequate to indicate the action has a non-literal orientation; however, the speech “specifies” (Veneziano, 2002, p. 8) the meaning of the action as a pretend play enactment (i.e., as non-literal, as if play; non-literal *feeding; tasting; offering*); such verbal enactments make the pretend play “clearly understandable” (Veneziano, 2002, p. 8). Speech may also occur alongside other behavioural play and pretending signals and “duplicate” (Veneziano, 2002, p. 8) the meaning of the action as a pretend play action. For example, if a child fully tilted their head back with a cup at their mouth *and* vocalised “mmm good”, here, the speech (verbal enactment) “adds little to the pretend meanings already conveyed by the child’s actions” (Veneziano, 2002, p. 8) but does add further support that the action is an enactment of non-literal pretend *drinking*.

Verbal enactments and vocalisations can therefore be used to identify other specific types of pretend enactments (e.g., the types of pretend enactments noted earlier, e.g., *pretend play directed towards self*, and, as discussed, *object substitutions*), in a similar manner to observing a behavioural signal such a tilt or tip. Dixon and Smith’s (2003) observational coding category *Pretend-Self* includes “drinking *action* with accompanying drinking sounds or verbal narrative” (p. 183) an example of behaviour in this category. Similarly, DiCarlo and Reid (2004) include the example of “*talking* on a toy telephone”, alongside the example of “*tilting* a toy pitcher down toward a toy cup” in their *single step pretend toy play* observational coding category (p. 199). Likewise “phone receiver to ear and *vocalize*” is included on Belsky and Most (1981)’s observational coding scheme for measuring play as an example of *pretend self*, alongside the example of “raise cup to lip; *tip* cup...*tilt* head” (p. 632).

Therefore, the speech supports or confirms the child is performing playful, non-literal *drinking; pouring; telephoning*; the speech indicates the child is verbally “attributing properties to an object which it does not have”, i.e., referring to properties/ elements of an object or situation that are not literally present, or “referring to absent objects as if they were present” (Baron-Cohen, 1987, p. 140), e.g., liquid, taste, people etc.; thus, supports the child is engaging in a non-literal enactment.

Some speech fully “creates” the meaning of the action as *pretend play* (Veneziano, 2002, p. 8): “they refer to pretend aspects that are created by the mere fact of stating them” (Veneziano, 2002, p. 8), and thus, we can consider the verbal enactment *to be* the pretend enactment. For example, where a child simply holds a doll, it is difficult to identify if the action possesses any nonliteral orientation; however, where the child holds the doll, then looks at the doll and then speaks to, or about the doll as if it has real characteristics, there is the evidence of the child verbally attributing animacy to the object: i.e., the doll cannot literally hear the child, or does not literally have lifelike qualities, but the verbalisation indicates the child is attributing such non-literal qualities to the object (animacy) and the speech fully shows the meaning of the action as a pretend play enactment where the action of simply holding a doll would be difficult to identify as having a nonliteral orientation. McLoyd (1980) included “holding a doll” and speaking “my baby is crying, cause she doesn’t want to take nap” as an example of an “utterances which denoted a condition of nonliteralness”, in the specific category of *animation* (McLoyd, 1980, p. 1135). Veneziano (2002) included the examples of the child speaks “is cold” ... “just before placing a toy quilt over the baby” as an example of speech that fully *creates* the pretend play meaning (p. 8). Such utterances can be identified as pretend speech through exaggerated tone (or change) of voice (Howe et al., 1998, Garvey, 1977), the content of the speech, or often both tone and content.

Further examples of verbal pretend play enactments that fully create the pretend meaning and would be difficult to consider as non-literal by action alone are evident in the literature: “looking at an empty toy bottle... speaks ‘no more’” (Veneziano, 2002, p. 9); the child “jumped off the table...and speaks “we're at the store now”; the child pushes a toy truck, verbalises “‘screech’ and ‘vroom’” sounds (McLoyd p. 1135); and “Charlie...pushed a toy train to accompanying sound effects... ordering, “all aboard” (Haight & Miller, 1993, p. 135). In these instances, holding the doll, jumping off the table, looking at a bottle and pushing a car exist fully in the literal environment. Therefore, the speech fully portrays the child behaving in a non-literal manner, verbally referring to non-literal or absent properties and elements (McLoyd, 1980; Baron-Cohen, 1987; Veneziano, 2002).

2.1.3.3.1 Verbal role enactments. Role enactment/role play/transforming into a role, where the child pretends to be a person or character, e.g., a fireman, or a doctor (Thorp, Stahmer, & Schreibman, 1995; Youngblade & Dunn, 1995; McInnes & Elpidoforou, 2018) fits the conceptualisation of pretend play as non-literal, as if, transformative play. Westby (1991) notes this type of pretend play appears for 80% of children (from middle-class households) around 3 years of age; thus a code for this type of behaviour is generally absent from observational coding schemes used to identify pretend play in children under 21 months of age (e.g., Belsky & Most, 1981; Tamis-LeMonda & Bornstein, 1991; Largo & Howard, 1979). Researchers use a variety of different terms for this types of activity: *Role play* (Thorp et al., 1995; Youngblade & Dunn, 1995; McInnes & Elpidoforou, 2018); *Role assignment* (Nielsen & Dissanayake, 2000); *Role assumptions* (Russell & Russnaik, 1981); *Transforms self into role* (Westby, 1991); *Sociodramatic play* (Kasari et al., 2006); *Adopting familiar/fantasy role* (Harrop, Green, & Hudry, 2017); *Role-taking utterance* (Olszewski & Fuson, 1982); and others.

Verbal evidence is crucial for identifying when children are engaging in *role play*, i.e., pretending to be a person or character. For example, Haight and Miller (1993) note they excluded children throwing a basketball towards a miniature hoop as a type of pretend play, but included actions where there was evidence of as if, or transformation elements, such as the child speaking “I’m a Chicago Bears!” (p. 139). Other researchers note similar examples of children verbally demonstrating role play (or *role attribution*): while running toward the wall, “Look, look, I’m Doctor J jamming” (McLoyd, 1980, p. 1136). A child running across a room is ambiguous as demonstrating role play (pretend play); however, if the child shouts in exaggerated voice, ‘I am Batman catching naughty people’ there is evidence of the child behaving in a manner distinct from reality. Researchers commonly note that verbal statements are essential for confirming a child is enacting a role; either the child specifically naming the role, talking as if they are the character using a change of voice, or using “first person pronouns” (e.g., Olszewski & Fuson, 1982, p. 59; Russell & Russnaik, 1981; Thorp et al., 1995; Youngblade & Dunn, 1995; Kasari et al., 2006). Thorp and colleagues (1995) noted the child had to “verbalize his adopted role (i.e., ‘I’m a doctor.’ or ‘I’m putting out a fire.’)” to be counted as role playing (p. 270).

Some researchers alternatively note that role play can be expressed verbally, or shown simply by action (e.g., Smilansky, 1968), with some researchers using separate coding categories for the child *acting* out roles or *verbalising* a role (e.g., Youngblade & Dunn, 1995; Nielsen & Dissanayake, 2000). Youngblade and Dunn (1995) required a verbal statement for *role play*; however, the child could act the role to be counted *role enactment*. Conversely, Nielsen and Dissanayake (2000) noted that *role play* did not require a verbal confirmation, while the behaviour of *role assignment* did. Where researchers include an action only category, there may be issues with assessing the non-literalness of the behaviour. For example, Youngblade and Dunn (1995) notes the child acting out, “flying as Superman”

and “Daddy preparing to go to work” as examples of role enactment (p. 1476) but without a verbal confirmation of the new role, these instances would be difficult to confirm as the child behaving in a non-literal way, e.g., the child may possibly be running across the room, or trying on ‘work’ clothes. Other researchers make no reference to whether role play or role enactments should be identified with verbal evidence e.g., (Westby, 1991; Harrop et al., 2017).

2.1.4 Summary

Pretend play can therefore be identified by observation of children performing the types of actions detailed above (e.g., pretending to drink; pretending to pour; substituting one object for another and using in play; verbally transforming themselves into a character etc.). For evidence that a child is performing play and is *pretending* to drink (playfully drinking, non-literal drinking), *pretending* to pour (playfully pouring, non-literal pouring), substituting a cup as a hat, and not simply exploring a replica cup or other miniature replica (i.e., not ‘what does this object do, but what can I do’), and *pretending* to be a superhero (rather than just running around the room), we can observe behavioural signals of play accompanying these suspected pretend actions, i.e., exaggeration and elaboration, repetition, sound effects, confirmatory speech (or modified tone), or other ludic elements. Observational coding schemes for measuring early pretend play (especially those designed for ages before children are verbally able to confirm their pretend play) should therefore include clear operational definitions for specific types of enactments which note key observable behavioural signals and indicators of play. Clear operational definitions that include these elements provide evidence that children are performing acts that indicate engagement in pretence that is truly playful.

2.1.5 Review of Existing Observational Coding Schemes for Identifying Pretend Play Used in Free Play

Consequently, I conducted a literature review of previously reported early pretend play coding schemes to investigate how previous authors had measured pretend play, with a specific focus on whether operational definitions made reference to exaggerated or elaborated elements of pretend acts (i.e., exaggerated movements; sound effects) and whether earlier schemes clearly, or fully, operationally defined observable signals and markers that help to identify early actions as play, and pretend play in particular.

The review focused on studies of pretend play at 18 months of age and younger. Lillard (2015) noted “that object substitutions in pretend production are rare prior to 19 months” (p. 441) and Ungerer and colleagues (1981) observed meaningful vocalisations and speech confirming imaginary play at 18 months of age (in half of the children studied); as noted earlier in this chapter, these forms of pretend play are widely accepted as indicators of pretend play. My primary aim was to: (1) explore if key signals of play are used in observational coding schemes for the types of enactments that are suggested to appear earlier in development and sometimes debated as forms of pretend play (i.e., *drinking; pouring* etc.) and (2) examine how actions have been identified as pretend play before children can verbally confirm their pretending. However, to help inform the measurement of other types of pretend play in the later chapters of this thesis, I also explored how researchers had operationalised other types of pretend play (some studies observed children 18 months of age and above, in addition to the younger age that the review focused on; therefore their coding schemes included the measurement of more advanced types of pretend play).

Free play sessions, compared to more structured instructional tasks, may be a better methodology in which to investigate more motivational differences in infants’ pretend play (Vondra & Belsky, 1991), something that will be the focus of later chapters in this thesis.

Free play sessions provide a measure of performance, rather than measuring the child's highest-level competence (i.e., as in a structured object-substitution task; Vondra & Belsky, 1991) and may highlight infants who orient more toward pretend play rather than other types of activity. Therefore, the review will focus on studies that have conducted observations of infants' pretend behaviour in spontaneous free play situations. One defining feature of play (discussed earlier in this chapter) is its spontaneous and non-instrumental nature. Free play scenarios, rather than instructional-based tasks, would therefore be the best methodology to elicit behaviours that fit such definitions.

A list of studies from my review of previous literature that met the criteria described below is presented in Appendix A. A brief description of each research method and the elements of the coding schemes devised for the research most relevant to the current investigation are included in the table. Only research focusing on infants' pretend play at 18 months and younger (the reported mean or range) was included in the review (including autism or Developmental Delay [DD] samples where the Mental Age range [MA] was reported to include infants aged 18 months or under). Studies measuring only the purely social (e.g., onlooker vs active partner) or cooperative aspects of pretend play were not included. Observation of spontaneous free play must have been part of the methodology for the study to be included in the review; however, I included studies where this was sometimes preceded, or followed, by experimenter modelling sessions. Further, the observations had to be carried out by study researchers, and not teachers or parents, to be included in the review. Where a coding scheme was explicitly noted as being developed from previous literature, this was noted; studies using coding schemes fully replicated from earlier coding schemes were not included (this may have meant some coding schemes are not included in the review if children were not in the target age range when the coding scheme was first developed, but the later studies did include children of target age. Observational coding schemes created for

identifying different types of *play* were included in the review if the coding of pretend play was a key component of the play scheme.

A number of different terms are used in the literature to refer to early ‘pretend play’ actions (actions such as pretend drinking; pretend eating; pretend pouring), including, “symbolic” acts (Fenson, Kagan, Kearsley & Zelazo, 1976); “representational, single toy” acts, (Rosenblatt, 1977); “single scheme representation play”, (Fiese, 1990); self-pretence (auto-symbolic) (McCune, 1995), and “imaginary play” (Nielsen & Dissanayake, 2000). Fein (1981) similarly observed that make-believe play, imaginative play, fantasy play and dramatic play are terms used interchangeably in the literature. Others have noted that symbolic play and pretend play are used to indicate the same actions and are analogous (e.g., Jarrold, 1993; Roggman, 1991; Lifter, Mason, & Barton, 2011) and Piaget (1962) referred to similar activities as “imaginative”, “make-believe” and “symbolic” play. Therefore, studies using these different terminologies were included in the review.

Studies meeting the same sample and methodological inclusion criteria as those detailed in Appendix A, but where similar actions (e.g., drinking; eating; pouring, with miniature replicas) were operationalised as ‘simpler’ forms of play, namely, *functional play* (but not *functional pretend play*) are listed in Appendix B. The list includes some studies that assume that *functional play* and *pretend play* are theoretically distinct types of action; it is important to investigate if (and how) the authors included signals of *play*.

2.1.6 Evidence for Ludic Signals

It is evident from the literature review (see Appendix A and B for a full list of studies that met the inclusion criteria) that previous operational definitions, used in observational studies of infants’ free play, often made no reference at all to any types of exaggerated, elaborated gestures/ludic elements, play or pretending signals required to code an early action

as *pretend play* (e.g., Fein, 1974; Jeffree & McConkey, 1976; Nicolich, 1977; Rosenblatt, 1977; Fenson, 1978; Largo & Howard, 1979; Russell & Russnaik, 1981; Shimada, Kai & Sano, 1981; Fiese, 1990; Ogura, 1991; Tamis-LeMonda & Bornstein, 1991; Tomasello, Striano & Rochat, 1999; Brown, Rickards & Bortoli, 2001; Lewis & Ramsay 2004; Daunhauer et al., 2007; McInnes & Elpidoforou, 2018). Rather, the actions were defined simply as “drinking from a cup”; “eat from spoon”; “pouring” and such like or defined in more general terms. There may be additional criteria on the actual coding schemes used for the data collection (e.g., as was noted by Lowe, 1975), but my analysis is based on the available published information.

Where exaggerations, elaborations and other signals of play were included in the operational definitions (see Appendix A and B for examples) the definitions were not fully described for each type of pretend play (or functional play) action (e.g., Bates et al., 1979; Jackowitz & Watson, 1980; Belsky & Most, 1981; Gowen et al., 1992; McCune, 1995; Dixon & Smith, 2003; Williams, Reddy & Costall, 2001; DiCarlo & Reid, 2004; Ebeling, 2011). For example, pretend drinking acts may have been operationalised with some reference to the exaggerated elements that were required for the action to be coded as pretending; however, this precision in operationally defining the exaggerated elements would then be lacking for other actions, e.g., pretend pouring and pretend feeding the doll. Further, while the definitions sometimes included references to ‘tilts’ and ‘throwing head back’ it was not clear how a ‘tilt’ was actually operationalised. Pierce (2009, unpublished PhD thesis) provided detailed operational definitions (see Appendix A) for most possible pretend play (*labelled functional & symbolic*) actions with a tea-set which exceeded the detail on many other earlier coding schemes and indicated the coded actions would have moved past exploration (i.e., not afforded by salient physical properties of the objects); however, generally only one mode of how the child could demonstrate the action was operationalised/or provided as an example.

For example, for *eats*: “object is held in proper orientation (by handle) and enters mouth in proper orientation” (p. 83); however, possibly the child could also *tilt* the spoon towards mouth to enact eating.

The same lack of precision in coding definitions is also found in research that has used more instructional tasks to measure infant pretend play. In the context of a longitudinal study of Australian infants, Nielsen and Dissanayake (2004) asked children aged between 12 and 24 months to perform a series of actions: “Can you have a drink?” and “This is Dolly. She’s thirsty. Can you give her a drink?” (p. 347). Pretend drinking and pouring were then coded, with the criterion that an exaggerated gesture, such as tilting the head to drink from an empty cup, needed to be present. Thus, the exaggerated gesture for pretend drinking was alluded to; however, pretend pouring was not so clearly defined. Similarly, lack of precision in operational definitions is evident in the Test of Pretend Play (ToPP; Lewis & Boucher, 1997), a standardised symbolic play test that can be administered to children aged 1-6 years. A set of standardised toys includes a bear, bowl and spoon. The first section assesses the child’s ability to “reference to an absent object” using “self with everyday objects” (p. 14). Following the instructed question, “Show me how you eat your breakfast”, infants are scored as passing the *instruct* item if they “Use the bowl and spoon appropriately, pretend to take food out of the bowl using the spoon and feed himself or the tester” (p. 14). A later section of the test again assesses the child’s ability to “reference to an absent object” with a “representational toy alone” (p. 19). To pass this part of the test the child should demonstrate, “Pretending to hold a cup and giving teddy a drink or acting out teddy picking up a cup and drinking from it” (p. 20). The same scoring criteria can be used to assess symbolic play in

free play situations. What is absent from the coding definitions is any mention of the crucial playful, exaggerated, elaborated movements that indicate pretend play is taking place⁶.

2.1.7 Summary of The Earlier Literature and Aims for The Current Body of Work

It is evident from the review of previous work that the operational definitions used in previous coding schemes investigating infant pretend play were not detailed enough for use in the current investigation. Often, there was no reference at all to any exaggerations or elaborations required to code the pretend actions (e.g., Fenson, 1978; Ogura, 1991; Brown & colleagues, 2001; see Appendix A and B for further examples). Where exaggerations were noted, or alluded to, the definitions were not consistently, clearly, or fully described for each type of pretend play action (see Appendix A and B); for observational studies of relatively large numbers of children it is important to operationalise specific enactments with the toys provided (e.g., picnic and tea sets) to ensure reliability across multiple observers. There is a need for the development of new observational coding schemes for identifying early pretend play that include more definitional precision, in particular, operational definitions that clearly note the child's observable use of behaviours that signal play. Addressing this need was one aim of the current thesis.

⁶ "Nonverbal" versions of the ToPP are included on the instrument, where the tester models the symbolic actions (i.e., from Section I and Section III; eating breakfast and teddy having a drink); if the child **copies** the tester they are awarded as passing this modelled part of the test. The modelled instructions for the tester (and thus the behaviours that the child must copy) do include reference to the tester vocalising eating and drinking *noises* and *tipping* teddy's head.

Section 2.

Do the Vast Majority of Children between 18 and 30 Months of Age Show Pretend Play?

A Review of The Existing Literature

2.2. Introduction

Previous authors, referring to earlier findings, often note that the first instances of pretend play emerge generally by 18 months of age (e.g., Baron-Cohen et al., 1992;1996; Rutherford, Young, Hepburn & Rogers, 2007; Weisberg, 2015) or by 18 *to* 24 months of age (e.g., Ungerer & Sigman, 1981; Leslie, 2002; Cabrera et al., 2017; Wilson et al., 2017). Thus, there appear some inconsistencies around whether the general emergence of pretend play is by 18 months of age, or rather, if there is still variation in the age at which pretend play emerges up to the end of the second year. In addition to these inconsistencies around whether ‘normal’ emergence extends into the 18 to 23 month age bracket, previous authors have noted methodological flaws with previous studies that may limit the generalisability of earlier findings on the emergence of pretend play (Farver & Howes, 1993; Haight & Miller, 1993; Lillard, 2015).

Understanding when the first instances of pretend play appear for the vast majority of children has important implications for the measurement of pretend play on developmental assessments for delay and disorders in clinical and early education settings; children are currently sometimes assessed on their pretend play abilities from 16 months of age⁷. While there is a vast amount of research on early pretend play, our understanding of when pretend

⁷ See Chapter 1: for example, the M-CHAT R/F instrument (Robins, Fein & Barton, 2009), includes assessment of pretend play abilities with children between 16-30 months of age, and the Q-CHAT (Alison et al., 2008), instrument is used with children from 18 months of age.

play emerges for the vast majority of children may be limited because there is little research that robustly and quantitatively examines, and brings together, earlier findings on the actual proportions/percentages of children who have been observed to show pretend play during the second and third years of life. The current review aimed to fill this gap in the literature, with a goal of understanding when pretend play emerges for the vast majority of children in general populations. I also aimed to assess whether the data from the samples of children previously investigated can be adequately generalised to wider populations. This review of the literature will highlight gaps in our understanding on the general emergence of pretend play, which have partly arisen due to the methodological limitations of earlier studies, thus justifying the new empirical studies to be presented in the later chapters of this thesis.

As noted above, some developmental screening instruments for developmental disorders and delay include assessment of children's pretend play capacities across the 18- to 30-month age period (e.g., the M-CHAT R/F); therefore, it is important to review the rates of pretend play reported to be shown by children within this age group. However, this is a wide age range, which possibly includes separate developmental periods that are key for pretend play emergence; therefore, the main aim of the review is to analyse the rates of pretend play reported in previous studies in two specific age brackets within the 18- to 30- month age range: 24 to 30 months of age, and 18 to 23 months of age. The rationale for focusing on the rates of pretend play within these two specific age brackets is discussed below. Assessments of children's pretend play (as part of developmental screening and in the UK early years education system) are frequently carried out during observations of free play activities; therefore, studies that include observations of free play sessions (either in laboratory or natural settings) are reviewed first in this chapter. Standardised pretend play assessment instruments that rely on observations of children and provide age-normed data are also reviewed, to see if the vast majority of children are reported to engage in pretend play during

these developmental periods and whether the data used to develop the age norms for these measures is adequate to generalise from.

Twenty-four months onwards is most often considered the age by which pretend play should have emerged. Recent research carried out using the 'SACS items' assessment instrument (an early screening instrument for autism; Barbaro & Dissyanke, 2012) found that an absence of pretend play at 24 months of age was a key predictor of an autism diagnosis, while an absence of pretend play at 18 months did not distinguish children diagnosed with developmental delay from children diagnosed with autism (Barbaro & Dissyanke, 2012). The authors recommended that, at 24 months of age, developmental surveillance should include assessment of children's pretend play abilities.

Similarly, children assessed against age-expected norms using the Westby Symbolic Play scale (Westby, 1980; 1990; 2000) and the Revised Knox Preschool Play Scale (RKPPS; Knox, 1997; 2008) are expected to enter a new stage of pretend play (and other activities) around 24 months of age (although pretend behaviours are expected to have emerged at earlier stages). Furthermore, as some researchers have summarised the literature and noted the age of pretend play emergence to be by 18 to 24 months (e.g., Ungerer & Sigman, 1981; Cabrera et al., 2017; Wilson et al., 2017), there is an indication that after 24 months of age the vast majority of children should be capable of showing pretend play. Thus, from the second birthday onwards seems an important developmental period to first investigate for the general emergence of pretend play. The M-Chat (Robins et al., 2001) and M-CHAT R/F (Robins, Fein & Barton, 2009) screening instruments used for identifying early signs of autism, which include assessment of children's capacity for showing pretend play, are designed for use with children up to 30 months; therefore, it is important to review previous studies reporting on the rates of pretend play shown by children within the 24- to 30-month age bracket, to confirm that the vast majority of children show pretend play in this age range.

If the vast majority of children aged between 24 and 30 months, in the vast majority of studies, show pretend play during this age period, there is evidence that pretend play has emerged by, or during, this developmental period. It is only when a behavioural skill, such as displaying pretend play, is mastered by “the vast majority of children” that any delay in development of that skill can become apparent (Swinkels et al., 2006, p. 724).

Based on the evidence just discussed, it is expected that the vast majority of children in the 24- to 30-month age bracket will have been found to show pretend play in earlier studies, but it is still important to confirm this; so, to investigate further when pretend play first emerges for the vast majority of children the review will then look at rates of pretend play in a younger age range. There appears some uncertainty in the literature around pretend play emergence during the second part of the second year, with some inconsistencies about the status of pretend play within the 18- to 23-month age bracket; therefore, it is important to review previous studies reporting on the rates of pretend play shown by children within this age bracket to investigate if the existing evidence supports claims on the inclusion of measures of pretend play on developmental assessments during this time. If almost all children in the 18- to 23-month age range, in the vast majority of studies, are reported to show pretend play, there is evidence that pretend play has emerged for the vast majority of children within this developmental period (or before). However, if individual differences are present, this would indicate there may be still be ‘normal’ variation within the last half of the second year and the capacity to show pretend play may emerge later for some children.

It is important to clarify what is meant by the term the ‘vast majority’ used throughout this chapter, and thesis. The term, in this review, is used to describe when a substantial proportion of children show a behaviour, in this instance, when a substantial proportion of children show pretend play; thus, indicating widespread acquisition of that behaviour. In previous reviews of the literature on children’s play behaviours, the term (‘the vast majority’)

is used to describe the prevalence of a phenomena across studies (e.g., Pellegrini & Bjorklund, 2004; Barton, 2010; Kossyvasi & Papoudi, 2016; Whitebread et al., 2017). An alternative term, simply, ‘the majority’, has also been used within the literature on the emergence of pretend play (e.g., Howes, Unger, & Seidner, 1989; Nielsen & Dissanayake, 2004). This term was not used in the current thesis as it may not accurately describe a situation where pretend play has emerged in, or before, a developmental period; the ‘majority’ could refer to just 51% of children displaying pretend play (i.e., not indicating widespread acquisition).

Furthermore, there appears marked discrepancy in the arbitrary quantitative values attached to the term ‘the majority’ within the pretend play literature base. For example, Nielsen and Dissanayake (2004) referred to 85% of children showing pretend play as the “majority” exhibiting pretend play when they estimated “the mean age of emergence for pretend play” (p. 350). However, Howes and colleagues (1989) used the criterion of 67% of children showing a pretend behaviour to represent “the majority” of children. Conversely, some consensus is evident for the arbitrary quantitative values ascribed to represent the ‘vast majority’ of children; often referred to as between 80 to 85% of the sample displaying a behaviour (e.g., Perner, Leekam & Wimmer, 1987; Fry, 2005; Kos, 2010). Similarly, Westby (1980) used the criteria of 80% of children showing a behaviour in development of the Symbolic Play Scale (described later in this chapter); the age levels when specific play behaviours are expected on the scale (e.g., *self as agent; child pretends to eat from a spoon*) are based on when 80 % of children in the development sample performed the specific pretend play behaviour. Therefore, 80% of children showing a behaviour is considered to indicate widespread acquisition. Consequently, within the current review, I adopted the percentage of 80% or more of children showing pretend play as a quantitative measure of the ‘vast majority’ of children showing pretend play. Alternative terms used to describe the

widespread acquisition of pretend play, e.g., ‘universal’ and ‘ubiquitous’ (e.g., used by Baron-Cohen et al., 1992; and others), were also considered for use in the review; however, I decided that this was not appropriate terminology to use. Just one child not showing pretend play would lead to the criterion not being met, thus the terminology does not allow for measurement error (i.e., a child does not show pretend play because they are ill; tired; upset during an observation rather than because of a lack of pretend play competence or preference).

If we find there are individual differences in showing pretend play in observational studies, an alternative explanation might be that some children may have the capacity to engage in pretend play but ‘chose’ to not perform pretend play during free play observations. Free play sessions may not reveal a child’s optimal pretend play *competence* (i.e., their optimal ability/capacity to engage in pretend play; whether children *can* engage in pretend play), but rather, it might be the child’s pretend play *performance* on that occasion that is shown, i.e., the highest level of play children exhibit spontaneously (such as spontaneously exhibiting the ‘level’ of *pretend* play); whether children ‘choose’ to voluntarily engage in pretend play on that occasion (Belsky, Garduque & Hrcir, 1984; Vondra & Belsky, 1991; Rutherford et al., 2007). Therefore, free play sessions may show individual differences in children’s motivation, propensity, or interest to perform pretend play enactments (Vondra & Belsky, 1991; Rutherford et al., 2007). However, the child inevitably needs to first possess competence and have the skill to subsequently use it in free play (Vondra & Belsky, 1991); thus, if all children show pretend play, all have the capacity to engage in pretend play. Some children may have more of a propensity towards engaging in pretend play and other imaginative activities and this propensity may be stable over time (Singer, 1973). This needs consideration if free play sessions are to be used for developmental assessments (or used for investigating the emergence of pretend play). If individual differences in displaying pretend

play are found to be reported in the 18- to 23-months age bracket, either due to competence or performance, caution is needed when using an absence of pretend play in free play sessions around this age as a marker of developmental delay or disorder. Pretend play may still emerge ‘normally’ at a later point, or those children who show pretend play may simply be demonstrating a preference for pretend activity rather than demonstrating any cognitive advancement.

As brief observations of free play may not be sufficient for fully measuring a child’s capacity to show pretend play (Belsky, Garduque & Hrcir, 1984; Vondra & Belsky, 1991), this chapter additionally reviews data on the rates of pretend play in this age range gathered from informant-report studies. The use of informant (e.g., parent) reports is considered important for providing information about children’s natural pretend play behaviours (Inada, Kamio, & Koyama, 2010); some authors posit that informants provide a more accurate reflection of children’s optimal play level across situations compared to single time point observations (Robins et al., 2001; Honey, 2007).

Play behaviours shown during clinical or laboratory observations may be different to those performed in natural home environments (Pierucci, Barber, Gilpin, Crisler, & Klinger, 2015). Similarly, it has been suggested that the use of modelling, and verbal suggestions to pretend given by an experimenter during more structured instructional tasks may elicit more behaviours than free play sessions do, and therefore show more of a child’s competence for pretend play (Belsky, Garduque & Hrcir, 1984; Vondra & Belsky, 1991). Thus, this chapter explores some findings from these different data sources to investigate further the emergence of pretend play; while further considering if earlier findings can be adequately generalised to wider populations.

Because different assessment instruments used in developmental screening for delay and disorder and assessments in education settings rely on different methods of data gathering, it is important to know if the percentages of children found to engage in pretend play between 18 and 30 months of age are similar when different data gathering methods are used. Observations of children's free play and natural activities are used on some instruments and used for assessments in the UK education system, while other measures rely on parents' reports (e.g., the M-CHAT early screening device) and GP/health visitor reports (e.g., the CHAT); is there agreement on the proportions of children showing pretend play across informants' reports of pretend play and researchers' observations of pretend play?

Examining the different percentages reported when researchers use different methods of data gathering will help to ascertain if observational methods are useful for identifying children's capacity for pretend play; if a higher percentage of children are reported by informants to show pretend play in the key ages investigated, this may indicate that some observational methods (e.g., free play sessions in the home) underestimate children's capacity for pretend play. Exploring correlations between children's performance on observed pretend play assessments with parents' reports of pretend play is one way of assessing the validity of researchers' observations (Frahsek et al., 2011). However, while observational methods may underestimate children's capacity for pretend play, it should be also considered that informants may misinterpret or misreport items, forget behaviours, report on behaviours not considered pretend play by researchers or fail to report on play behaviours due to confusion over questionnaire wording (Fenson et al., 1994; Honey, 2007; Inada et al., 2010).

Therefore, to understand fully agreement across different measures of pretend play, it is important to study the same children using multiple methods of data gathering, e.g., observations of children's pretend play and collection of informant report data. The importance of using multiple methods across a variety of settings, and informants, to allow

children to show optimal play competence was previously recommended for autism assessments (e.g., Pierucci et al., 2015). Within this chapter, I will additionally review data on the proportions of children reported to engage in pretend play between 18 and 30 months of age provided from studies using mixed methods of data gathering. The review will show that few studies have used a mixed methods approach and will highlight the need for the new empirical studies, such as those presented in the latter chapters of this thesis, that use mixed methods to investigate the rates of pretend play in the toddler years.

2.2.1 General Search Strategy

The literature I reviewed includes journal articles, books, book chapters and doctoral thesis documents. To find relevant literature, I first performed computerised searches of online databases. I primarily used the Web of Science (WOS) “All Databases” database. The search terms included “pretend play”; “symbolic play”; “imaginative/imaginary play”; “make believe play”. I further performed more specific searches using the Web of Science databases with the search terms “pretend play” and “symbolic play” AND additional terms “observational”; “parent”; “parent report”; “questionnaire”; “longitudinal”; at a later time point to ensure I had not missed any key studies. I additionally used the Google Scholar online database for more specific searches using the search terms “pretend play” and “symbolic play” with the terms “nationally representative sample”; “representative of the general population”; “sample representative of”; ; and additional key term combinations (e.g., “pretend play” AND “nationally representative” AND “24 months”; “symbolic play” AND “nationally representative” AND “21 months”; “pretend play” AND “questionnaire” AND “Parent” AND “correlation” AND “observation” AND “24 months”, and others). I also performed searches using the terms “pretend play”; “symbolic play”; “pretend play”/“symbolic play” AND “longitudinal” on the Google Scholar database and reviewed the initial, key texts that the database found; however, the volume of entries (35,000 + for “pretend play”) meant this search

strategy was not manageable, which is why I used more specific searches on the Google Scholar database and why I primarily used the WOS database. Google Scholar was useful for finding data presented in doctoral dissertation documents. I used the “cited by” function on Google Scholar to snowball from key texts, e.g., Haight and Miller (1993); Belsky and Most (1981); Lowe (1975), and searched lists of publications from some prominent researchers in the field. I also snowballed manually from the articles and books I identified from the online searches. I contacted some authors via email to access additional information and to access conference presentation documents that were not available online.

I accessed some of the clinical and educational assessments discussed in this chapter from educational psychologists and other researchers working in the psychology field (e.g., the Test of Pretend Play, Lewis & Boucher, 1997; The Autism Diagnostic Observation Schedule, Second Edition, Lord, Rutter, DiLavore, Risi, Gotham, & Bishop, 2012). The inclusion, and exclusion, criteria for the main review of the literature are presented on p. 59- 60. I included studies where authors had reported instances of pretend play even when the primary purpose of the research was to assess behaviour other than pretend play.

2.2.2 Do the Vast Majority of Children Aged Between 18 And 30 Months Show Pretend Play During Observations of Free Play?

As discussed in Section 1, Piaget (1962) proposed that pretend play (“make-believe”) emerges towards the end of the sensory-motor stage, beginning when there is application of a familiar schema (e.g., drinking) to “inadequate objects” evoked “for pleasure” (p. 97); ludic elements accompanying an action, e.g., smiling, laughter, sound effects, speech and exaggerated actions (e.g., repeated blinking) indicate there is performance for pleasure and show “indication of the representational symbol” (p. 96). Piaget carried out observations of his own children and reported pretend actions performed by Child J. at 15 months and Child L. at one year of age. Between 18 to 20 months of age, Piaget observed his own children to

engage in the following pretend play behaviours (which were said to illustrate the emergence of the ludic symbol):

1:8 years: “She pretended she was eating various things, e.g., a piece of paper, saying, ‘Very nice’.” (Piaget, 1962, p. 96)

1:7 years: “She pretended to drink out of the box and then held it to the mouths of all who were present” . . . “making noises with lips and throat” (Piaget, 1962, p. 97)

1:6 years: “She said *avon* (*savon*=soap) rubbing her hands together and pretending to wash them (without any water) (Piaget, 1962, p. 96).

Piaget’s observations show that for his children, within the 18 to 23 months of age category, pretend play had begun; although we cannot generalise from such a small sample of children from one family, such microgenetic studies are helpful in recording illustrative examples of early pretend play.

McCune-Nicolich (1977) carried out a longitudinal observational study on the development of early pretend play using a coding scheme that expanded on the work of Piaget (1962) in a microgenetic study of five children. All of the children, observed mostly in the home environment, showed symbolic play (e.g., the child pretended towards others, such as feeding a doll or pretended at activities of others, such as pretending to mop the floor) by 19 months of age. Similarly, Haight and Miller (1993) carried out a longitudinal study of nine children’s pretend play in the home ($n=8$ at 12 months). Three- to four-hour naturalistic home observations were carried out at 12, 16, 24, 30, 36 and 48 months. At 12 months, 50% ($n=4$) of children displayed pretend play, while at 24 months, 100 % of children were observed to engage in pretend play. While a strength of the study is the intensive longitudinal design, only nine children were followed, and all participants were from affluent, highly educated, middle class homes, thus again limiting the generalisability of the findings.

To move beyond the microgenetic studies, I conducted a literature review of studies carried out with larger numbers of participants that report the percentages of children displaying pretend play during observations of free play, both in naturalistic and laboratory settings (including those where toys are presented in standard arrangements or where children's natural daily activities were observed). Studies where 10 or more children, aged between 18 and 30 months, were observed, and where the number, proportions or percentages of children pretending were reported, were included in the review. Table 2.1 presents a list of studies that met those inclusion criteria.

A vast number of studies investigating early pretend play focus on developmental trends over time, or group comparisons; therefore, in those cases, mean figures, rather than percentage (count or proportion) data are reported. The question under consideration is how many children demonstrate pretend play; therefore, studies measuring the frequency, or proportion, of time spent in pretend play, total number of pretend play acts; mean levels of pretend play; or group comparison data, and not percentage data, were excluded from this literature review, unless the percentage of children showing pretend play could be clearly and unambiguously calculated from the data and information provided.

I included studies where experimenter modelling of behaviours was part of the procedure, but only if the modelled play was preceded by, or followed by, observations of free play and the percentage of children showing pretend play was reported in those segments (not during verbally scripted, or modelled parts). However, I excluded studies with trials where children were instructed to perform a pretend action but not in free play. For example, Neilsen and Dissyanke (2004) asked children to pretend to drink from a cup and asked if they could make a doll drink. Studies using the data from modelled or instructed parts of a task combined with free play scores where data couldn't be teased apart were also excluded (e.g., Corrigan, 1987).

I included studies where solitary and social (peer or sibling) play was observed, but I excluded studies where only the social categories of play were coded, e.g., how the child interacts with a partner. Children who were part of so-called ‘typically developing’ comparison groups were included in the review (if the comparison group met the other inclusion criteria); however, I excluded studies focusing solely on samples of children from specific clinical populations, e.g., children with autism, other developmental delay disorders, language disorders, or children who were deaf or blind.

As I discussed in Section 1 of this chapter, a number of different terms are used in the literature to refer to “pretend play”; therefore, I included studies using different terminologies for similar behaviours, e.g., symbolic; imaginative; make-believe etc. (see Section 1, p. 41 for a more detailed description). Section 1 of the chapter helped inform the types of actions I considered as pretend play behaviours. Descriptions of the coding schemes used in the studies are included in Table 2.1 to illustrate how the researchers coded what I would consider ‘pretend’ behaviours but have labelled the behaviours differently. With this same logic I included studies where similar behaviours were labelled as “functional” play or “self-directed/other-directed play”. However, studies where pretend, symbolic, imaginative play etc. were included with other types of play and part of a composite score with percentages of pretend play not specifically reported were excluded from the review; for example, Vandewater, Bickham, and Lee (2006) included a category of *Creative Play* that included drawing, colouring and so on, as well as pretend play.

Table 2.1

Previous research reporting the percentage/ number of children between 18-30 months of age showing pretend play during free play

Author(s) and Title	Age of children	Sample information	Methodology	Relevant Results
Belsky & Most (1981) "From Exploration to Play: A Cross-Sectional Study of Infant Free Play Behavior"	7 ½ to 21 months 10 age groups	<ul style="list-style-type: none"> • Cross sectional • 40 children (4 at each age point) • Middle-class homes • Names culled from public birth announcements, all healthy 	<ul style="list-style-type: none"> • Home visit; Standard arrangement of toys; Mother present - no initiation/elaboration • Up to 30 minutes observation • Coding scheme developed for the study, see Appendix A • 12 levels of exploration/play, including: <ul style="list-style-type: none"> ○ Pretend self: Raise cup to lip; tip cup, make drinking sounds, or tilt head ○ Pretend other: Feed doll with spoon, bottle, or cup ○ Substitution: Drink from seashell 	<p>Percentage of children showing pretend play levels:</p> <ul style="list-style-type: none"> • 18 months: <i>pretend self, pretend other and substitution: 100%</i> (n=4) • 19 ½ months: <i>substitution 50%</i> (n=2) <i>pretend self: 75%</i> (n=3) or <i>pretend other 75%</i> (n=3) • 21 months: <i>pretend self, pretend other and substitution: 100%</i> (n=4)
Brėdikytė, Brandišauskienė, Sujetaitė-Volungevičienė (2015) "The Dynamics of Pretend Play Development in Early Childhood"	1.5 to 7 years of age	<ul style="list-style-type: none"> • Cross sectional (included a group 1.5 to 3 years of age) • 454 children • Six kindergartens in Vilnius (86 %) and one in Marijampolė (14 %) – no other sociodemographic characteristics 	<ul style="list-style-type: none"> • Teacher observations of free play activities <p>"The teachers were asked to observe and evaluate children's free play activities (each teacher evaluated 6 children) using the proposed questionnaire." (p. 177)</p>	<p>Percentage of children showing different pretend play types:</p> <ul style="list-style-type: none"> • 1.5 - 3-year-olds, objects according to their purpose in pretend play: 42.9% • 1.5 - 3-year-olds, substituting objects: 36.9 % • 4 - 5-year olds, substituting objects: 39.5 %." • 1.5 - 3-year-olds. imaginary objects in play: 3.6 %

<p>Brown, Rickards & Bortoli (2001)</p> <p><i>“Structures Underpinning Pretend Play and Word Production in Young Hearing Children And Children With Hearing Loss”</i></p>	<p>28, 29, 30 months of age</p>	<ul style="list-style-type: none"> • Comparison study/ longitudinal study • 20 children (10 hearing/ 10 hearing loss) • All mothers completed 12 years of school, 7 further studies (hearing group) 	<ul style="list-style-type: none"> • Laboratory sessions; Three sets of toys/scenarios; Items placed on picnic mat; Mother present - play as normally would. Spontaneous; imitated; and solicited play coded • 10 - 15 minutes typical observation (mother child free play) • Coding scheme created for the study, see Appendix A. 	<p>Percentage of “hearing” children:</p> <p>Any pretend play: 100% Level 10, “imaginary transformation” (highest level): 80%</p> <p>Percentage of hearing loss children:</p> <p>Any pretend play: 100% Level 10, “imaginary transformation” (highest level): 0%</p>
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<p>Campbell, Leezenbaum, Mahoney, Moore, and Brownell (2016)</p> <p><i>“Pretend Play and Social Engagement in Toddlers at High and Low Genetic Risk for Autism Spectrum Disorder”</i></p>	<ul style="list-style-type: none"> • Mean at play observation: 22.75 months (<i>SD</i>=.70) • Follow up at 36 months 	<ul style="list-style-type: none"> • Longitudinal, comparison study • 145 children • Toddlers with an older sibling with autism (High risk) and comparison toddlers with a typically developing older sibling (Low risk) • Mostly Caucasian and non-Hispanic • Most parents had at least a college degree (72.5 %), parents of the comparison group toddlers were more highly educated than the “high risk” group. Only 14 % of LR parents had only “high school/some college” compared to 50 % of parents of toddlers with autism 	<ul style="list-style-type: none"> • Laboratory; free play; parent present – play as naturally would; standard toy set • 10 minutes of parent-child play coded for pretend play • Coding based on Belsky and Most (1981) <p>Three levels of play coded: (1) Simple manipulation or exploration (e.g., mouthing) (2) Functional play <i>the use of objects in an appropriate manner</i> e.g., stacking blocks (3) Pretend play “attribute pretend properties to the toys by acting out a sequence or play scenario (for example, pretending to cook by stirring and “tasting”; feeding themselves or their parent while playing with the kitchen set; moving the school bus or other vehicles while making sounds</p>	<p>Percentage of toddlers demonstrating “one bout” of pretend play (22.75-month observation):</p> <p>Low risk toddler: 77.5% Children with later diagnosis of autism: 27%</p>
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				suggesting driving or flying” (Campbell et al.,2016, p. 6)	
Carmody & Lewis (2012) “Self Representation in Children With and Without Autism Spectrum Disorders”	<ul style="list-style-type: none"> • 15 months to 24 months of age • Seen at 3-month intervals 	<ul style="list-style-type: none"> • Longitudinal, comparison study • Comparison group, 66 “Typically developing” children • Community sample, New Brunswick, NJ • No mention of other socio-demographic characteristics 	<ul style="list-style-type: none"> • Task followed Lewis & Ramsay (2004); Three phases: 2-minute free play; three modelled play scenarios; final 2-minute free play • Pretend play coded during both free play sessions • Coded as no pretend play, self-directed, or other-directed pretend play (including a mixture of self and other-directed) 	<p>Percentage of children showing other directed/mixture of self and other-directed pretend play (self-directed not reported):</p> <p>By 24 months: 80% (n=53)</p> <ul style="list-style-type: none"> - Only reported data of how many children had passed the behaviour by 24 months and not the specific time points 	
Charman, Swettenham, Baron-Cohen, Cox, Baird, & Drew (1997) “Infants With Autism: An Investigation Of Empathy, Pretend Play, Joint Attention, And Imitation”	<ul style="list-style-type: none"> • Chronological mean of “Normal control” group: 20.3 months (SD=1.0) 	<ul style="list-style-type: none"> • Children randomly selected for follow up study following administration of the CHAT as part of epidemiological study of 16,000 children at 18 months of age (Baron-Cohen et al., 1996), Following diagnostic tests three groups identified: • Autism risk group, 10 boys (not randomly selected from larger study) • Developmental delay group, 9 boys • “Normally developing” “normal control”, 19 boys (no autism or DD or other clinical problem) 	<ul style="list-style-type: none"> • Laboratory; Spontaneous play task, toys including a tea set spread out on the floor; parent’s present but minimal responses. • 5-minute observation of free play • Each act coded using Baron-Cohen (1987) categories of play: sensorimotor, ordering, functional play, and pretend play. Conservative coding • Only one example of action type needed 	<p>Percentage of children displaying functional and pretend play (“normal control” group):</p> <p>Functional play: 86.5%</p> <p>Pretend play: 63.2%</p>	

Charman et al. (2000) <i>“Testing Joint Attention, Imitation, And Play as Infancy Precursors To Language And Theory Of Mind”</i>	Time 1: Mean 20.1 months (<i>SD</i> = 0.9) Range: 18.3 to 21.3 months Time 2: Mean 44.3 months (<i>SD</i> = 2.5)	<ul style="list-style-type: none"> • Longitudinal • Comparison group of 13 “typically developing” children • Prospectively identified from Baron-Cohen et al., 1996 epidemiological study (see above) • No developmental disorder or disability • No other demographics reported 	<ul style="list-style-type: none"> • Laboratory; Spontaneous play task; toys laid out all at once when child entered the room; Parent present but only respond minimally • 5 minutes free play recorded • Dichotomous yes or no pretend play variable 	Percentage of children showing pretend play: 77% (n=10)
Damast, Tamis-LeMonda, & Bornstein (1996) <i>“Mother-Child Play: Sequential Interactions and the Relation between Maternal Beliefs and Behaviors”</i>	<ul style="list-style-type: none"> • 21-months-old 	<ul style="list-style-type: none"> • 50 children • “Middle- and upper middle-class” (p. 1754) 	<ul style="list-style-type: none"> • Home visit; Mother-Child free play session; Standard set of toys, including a tea set, own toys not included; Mother play as normally would • 10-minute observation Play coded as either exploration, nonsymbolic play, symbolic play, or off task 	<p>Number of children showing at least one instance of symbolic play:</p> <p>100% (I calculated this from the reported range of symbolic acts performed)</p>
Daunhauer Coster Tickle-Degnen & Cermak (2010) <i>“Play and Cognition Among Young Children Reared in an Institution”</i>	<ul style="list-style-type: none"> • Children between 9.8 months and 38.3 months of age (<i>M</i> = 20.3 months, <i>SD</i> = 8.5) 	<ul style="list-style-type: none"> • Comparison study with existing data (compared to McCune, 1995) • Twenty-six children • Living in Romanian orphanages, had to be institutionalised for at least 1 month, but no autism diagnosis, other diagnosable conditions, or physical disabilities 	<ul style="list-style-type: none"> • Conducted in living area/frequent area; Toys in standard layout • 6-minute observation with exploratory toys; 6-minute observation with symbolic toys • Play coded using Levels of the Developmental Play Scale (DPS) (Daunhauer et al., 2010) See Appendix A for further information: 	<p>Percentage of children engaging in any pretend play:</p> <ul style="list-style-type: none"> • Total sample: 35% (n=9) • 18.1 months - 23.4 months: 37.5% (n=3) • 24 months - 27.4 months: 50% (n=2)

Included:

				<p>7. Pretend self (pre-symbolic) <i>Engages in pretend play involving self (e.g., feeds self a doll bottle).</i></p> <p>8. Pretend other (1st symbolic stage) <i>Engages in pretend play not involving self (e.g., feeds doll with doll bottle)</i></p> <p>10. Substitution Uses object for something other than its overt purpose (e.g., uses a pen as a doll bottle).</p>	
<p>Fein, Moorin & Enslein (1982)</p> <p><i>“Pretence and Peer behaviour: An Intersectional Analysis”</i></p>	<ul style="list-style-type: none"> • 19 to 41 months • Three age groups 	<ul style="list-style-type: none"> • Cross sectional • 51 children • (Included 18 children in a 19 - 28 months of age group • No mention of social class demographics, but recruited from university childcare centre 	<ul style="list-style-type: none"> • Laboratory session; Peer play; Standardised toy set • 15 minutes play sessions • Coded social and solitary pretend play development • Five cognitive pretence categories <p>Included:</p> <p>2. Pretense/Pretend activities</p> <p>Self-related activities</p> <p><i>Feeding oneself with an empty baby bottle</i></p>	<p>Percentage of children engaging in Level 3, solitary pretend play</p> <p>19-month - 28-month group: 100%</p>	
<p>Fenson (1984)</p> <p><i>“Developmental Trends for Action and Speech in Pretend Play”</i></p>	<ul style="list-style-type: none"> • 20 months • 26 months • 31 months • (+/-) 3 weeks 	<ul style="list-style-type: none"> • Cross sectional • 72 children with 24 in each age group • “Middle SES backgrounds” 	<ul style="list-style-type: none"> • Four-part episode, free play, modelling, free play, prompting • Mother present- no prompt but respond to child • 3-minute + 3-minute free play observed • Coding scheme developed for the study (action + linguistic pretend play coded) 	<p>Percentage of children showing each ACTION type in pre-modelling phase:</p> <p>20 months: (not necessarily pretend)</p> <p>Self-directed: 88%</p> <p>Passive other directed: 83%</p> <p>Object directed: 100%</p> <p>Substitution: 71%</p>	

			<p>Included:</p> <p>Self-directed (<i>child combs own hair</i>) Object-directed (<i>child pours from a pot</i>) Substitutive (<i>cuts toy banana with wooden rod</i>)</p> <p>Self-directed utterances (<i>"I comb my hair"</i>) Passive other directed (<i>"I comb her hair", "Baby's clean now"</i>) Object directed utterances (<i>"cut this"; "that's hot"</i>) Verbal transformation Invention</p>	<p>Invention: 0%</p> <p>26 months:</p> <p>Self-directed:79% Passive other directed:96% Object directed:92% Substitution:46% Invention:25%</p> <p>Percentage of children showing each LANGUAGE type: 20 months:</p> <p>Self-directed: 0% Passive other directed: 8% Object-directed: 29% Substitution: 21% Invention: 0%</p> <p>26 months:</p> <p>Self-directed: 38% Passive other-directed:25% Object-directed:71% Substitution:54% Invention:8%</p> <p>Number of children showing at least one instance of symbolic play:</p> <p>18.5 months: 84% (<i>n</i>=16)</p> <p>At 18.5 months:</p> <ul style="list-style-type: none"> • Eat or drink: 74% • Pour: 64% • Feed Mother:10.5 %
<p>Fenson (1978)</p> <p><i>"Dimensions of Infant play"</i></p>	<ul style="list-style-type: none"> • Seen at 9.5, 13.5, and 18.5 months 	<ul style="list-style-type: none"> • Longitudinal • 22 children (19 at last visit) • Middle-class 	<ul style="list-style-type: none"> • Solitary pretend play; Tea-set was the only toy; Mother present but no initiation • 7-minute observation • Seven play types coded included: • See Appendix A for further information, included: 	

				(6) Symbolic acts (Any act involving pretending, including eating, drinking, stirring, pouring, or spooning (i.e., transferring imaginary substance from a container to the mouth or from one container to another))	
Fenson, Kagan, Kearsley & Zelazo (1976) <i>"The Developmental Progression of Manipulative Play in the First Two Years"</i>	<ul style="list-style-type: none"> • Four age groups: • M=7.7 months • M=9.7 months • M=13.6 months • M= 20.4 months 	<ul style="list-style-type: none"> • Cross-sectional • 57 children • No mention of socio-demographic characteristics 	<ul style="list-style-type: none"> • Laboratory; Mother present - but not initiate; Tea-set presented • Average 8-minute observation session <ul style="list-style-type: none"> • Three types of play: see Appendix A for more information, included: 	<ul style="list-style-type: none"> • Symbolic acts <ul style="list-style-type: none"> • Included eating (but not mouthing or chewing), drinking, pouring, stirring, and spooning (presumably imaginary substance) 	<p>Percentage of children demonstrated symbolic responses:</p> <ul style="list-style-type: none"> • 13-month-olds: 77% • 20-month-olds: 100%
Fenson & Ramsay (1980) <i>"Decentration and Integration of the Child's Play in the Second Year"</i>	<p>13.5, 19.5, and 24.5 months</p> <p>Cross sectional sample ages: +/- 14 days</p> <p>Longitudinal sample ages: up to +/- 21 days</p>	<ul style="list-style-type: none"> • Cross-sectional and longitudinal • Cross-sectional:72 children (24 each of ages • Longitudinal:19 children • Socio-economic demographics of sample not reported 	<ul style="list-style-type: none"> • Laboratory sessions; Identical protocol for cross sectional/ longitudinal; Toy set in standard arrangement on tables; Individual play; Mother present - but not initiate • 20-minute observation • Coding scheme devised for the study, see Appendix A • Not coded as pretence, even though many of the actions were, coded as self-directed, object-directed, other-directed 	<p>Percentage of children showing types of play behaviour: (cross sectional and longitudinal samples)</p> <ul style="list-style-type: none"> • 19 months; self-directed: 79%/ 95% • 24 months; self-directed: 71%/ 95% • 19 months; object-directed: 67%/ 63% • 24 months; object-directed: 83% /94% • 24 months; other-directed (passive): 90%/ 94% 	

			-Example: "Stirring with a spoon", "pouring from a container" (p. 173)	
Gagliano (2001) <i>"Social gaze and symbolic skills in typically developing infants and children with autism"</i>	18 to 24 months Mean 21.15 (SD=2.41)	<ul style="list-style-type: none"> • 27 children • Durham, UK • No other demographics reported 	<ul style="list-style-type: none"> • Nursery observation; Toy sets placed on table; Only experimenter present – not leading • 5-minute free play observation • Partly based on McCune, (1995): -Functional play - e.g., push car on floor; cup to lip -Symbolic play - e.g., feed doll; object substitution 	<p>Percentage of children displaying symbolic play:</p> <p>63% (n=17)</p> <p>Doll directed:33%(n=9) Object substitution:51%(n=14)</p>
Gaskins (2000) <i>"Children's Daily Activities in a Mayan Village: A Culturally Grounded Description"</i>	1 to 17 years of age Six age groups created: three-year age range	<ul style="list-style-type: none"> • Ethnographic/cross-sectional groupings • 13 families (60 children; at least 8 in each age group) • Malay village 	<ul style="list-style-type: none"> • Naturalistic observations of daily activities • Four hours of observation for each family 	<p>Percentage of children engaging in spontaneous pretend play:</p> <ul style="list-style-type: none"> • Between 1-10 years of age: 25% (n=10 out of 40) • 2 to 4 years of age: Most common • Began at "approximately 18 months of age" (p. 384)
Goncu, Mistry, Mosier (2000) <i>"Cultural Variations in the Play of Toddlers"</i>	Children aged from 12 to 24 months	<ul style="list-style-type: none"> • Cross-Cultural • 14 families from each community: <ul style="list-style-type: none"> ○ Dhol-Ki-Patti – Peasant community (India) ○ Kecioren - Middle income, urban community (Turkey) ○ Salt-lake city – Middle income, urban community (United States) ○ San Pedro – Peasant community (Guatemala) 	<ul style="list-style-type: none"> • Home visits; Usually one visit; Mother and other family members present; Four conditions in which play was observed, including: Novel objects - semi structured activity- "parents asked to explore unfamiliar objects with children" (p. 324) and Free activity – "unstructured activities, including playing with own toys" (p. 325) • Coded "pretend play" "using an idea or an object to represent 	<p>Number of children who engaged in pretend play in two of the play conditions:</p> <ul style="list-style-type: none"> • Free activity: <ul style="list-style-type: none"> ○ Dhol-Ki-Patti: 14.3%(n=2) ○ Kecioren: 35.7%(n=5) ○ Salt-lake city: 78.6% (n=11) ○ San Pedro: 7.1% (n=1) • Novel objects: <ul style="list-style-type: none"> ○ Dhol-Ki-Patti: 35.7% (n=5) ○ Kecioren: 85.7% (n=12) ○ Salt-lake city: 85.7% (n=12)

			the meaning of something else with the purpose of having fun” (p. 325)	○ San Pedro: 64.3% (n=9)
Gowen, Johnson-Martin, Goldman & Hussey (1992)	6, 11, 15, and 27 months (children without disabilities)	<ul style="list-style-type: none"> • Longitudinal/ comparison • 20 children without disabilities (n=18 at 27 months) /20 children with disabilities • Non-disabled recruited from local birth records • All Mothers had post high school education • Married:19 Mothers 	<ul style="list-style-type: none"> • Laboratory, Mothers present; “Behave as usually would”; Same toy set each visit • 20 minutes free play observed • 16 levels of play behaviours coded (based on Belsky & Most,1981; Fenson & Ramsay,1980; Nicolich,1977) <p>Includes: Pretend self (Level 8) – pretence behaviour directed towards self <i>Raised cup to lip and makes drinking sounds; puts phone receiver to ear and vocalises</i> Pretend other (Level 9) – pretence behaviour directed toward another being or object <i>Feeds doll with toy baby bottle or cup; pushes truck on floor and makes a truck noise</i></p>	<p>Percentage of children without disabilities showing symbolic play:</p> <ul style="list-style-type: none"> • 11-month assessment: 20% (n=4) • 15-month assessment: 80% (n=16) • 27-month assessment: 94% (n=17)
“Object Play and Exploration in Children With and Without Disabilities: A Longitudinal Study”				
Haight, Wang, Fung, Williams, & Mintz, (1999)	2.5 years of age at start, and observed at 3; 3.5; 4 years of age	<ul style="list-style-type: none"> • Ethnographic/ Longitudinal • 14 children (5 in the United States, 9 in China) • Middle-class home/two parent families 	<ul style="list-style-type: none"> • Home; Ethnographic; naturalistic observations • Two observations; 2 hours each at each age • Pretend play coded using codes developed for the study and Garvey (1990) definition of pretend play: “actions, objects, persons, places, or other dimensions of the here and now are transformed or treated 	<p>“All of the 14 children engaged in spontaneous pretend play at all three ages” (p. 1481)</p> <p>“All children also engaged in some pretending that involved no objects at all” (p. 1482)</p>
“Universal, Developmental, and Variable Aspects of Young Children’s Play: A Cross-Cultural Comparison of Pretending at Home”				

<p>Hrncir (1978)</p> <p><i>“Symbolic modes of activity in Two-year-old children”</i></p>	<p>Overall Mean: 26.75 months</p> <p>Overall Range: 20 to 33 months</p>	<ul style="list-style-type: none"> • Cross-sectional • 20 children (10 in two age groups) • Middle-class homes, from private nurseries • “children who seemed reluctant to accompany experimenter were not included” (p. 19) 	<p>nonliterally” (Haight et al., 1999, p. 1480)</p> <ul style="list-style-type: none"> • Nursery classes; Assessment on the floor; Only experimenter present; Highly prototypical vs low prototypical objects; Spontaneous play followed by play suggestions; • 12 minutes measured • Developed coding checklist based on categories from Lowe (1975); Nicolich (1977); and Watson & Fisher (1977), see Appendix A • Includes Level III: Applies action to self or adult (one-way) “child might pick up the brush and brush his hair” • Level IV - Applies action to self and/or adult and to objects one-way • Not necessarily pretend/symbolic? 	<p>Percentage of children showing the behaviours from the checklist:</p> <p>Mean age 26.75 months: Level III – 55% (n=11)</p> <p>Level IV – 70% (n=14)</p>
<p>Howes (1985)</p> <p><i>“Sharing Fantasy: Social Pretend Play in Toddlers”</i></p>	<p>16 - 17 months</p> <p>21 - 23 months</p> <p>27 - 28 months</p> <p>32 - 33 months</p>	<ul style="list-style-type: none"> • Cross-sectional • 43 toddlers (8-14 in each group) • Heterogeneous sample in terms of ethnic backgrounds, family structure, and socioeconomic status 	<ul style="list-style-type: none"> • Community day-care centres; free play sessions observed over 2-week time; peer interactions coded • 5-minute observations with peer/or when terminated if partner moved away • Coded using Howes (1980) Peer play scale which codes social play • Includes: Solitary pretend play 	<p>Percentage of children engaged in solitary social pretend play (with peer present, in context of social play)</p> <ul style="list-style-type: none"> • 16 - 17 months: 56% • 21 - 23 months: 86% • 27 - 28 months: 100%

<p>Howes, Unger & Seidner (1989)</p> <p><i>“Social Pretend Play in Toddlers: Parallels with Social Play and with Solitary Pretend”</i></p>	<p>Cross sectional groups:</p> <p>14-16, 17-19, 20-22, 23-25, 26-28, 29-33, and 34-38 months</p>	<ul style="list-style-type: none"> • Cross-sectional • 42 children (six in each age range) • “Well-educated families” 	<ul style="list-style-type: none"> • Home visit; standard arrangement of toys on floor; playing alone and with peer; Mother present, but not interfere • Two 15-minute observations • Solitary pretend play coded using sequences developed by; McCune-Nicolich (1981) and Watson and Fischer (1980) 	<p>“All children engaged in pretend play when observed alone” (p. 80)</p>
<p>Jackowitz & Watson (1980)</p> <p><i>“Development of Object Transformations in Early Pretend Play”</i></p>	<p>Group 1</p> <p>Mean: 15.96 months Range: 14 to 19 months</p> <p>Group 2</p> <p>Mean: 23.33 months Range: 21 to 25 months</p>	<ul style="list-style-type: none"> • Cross-sectional • 48 “normal, white, middle-class” • 24 children in each group 	<ul style="list-style-type: none"> • Laboratory session; Mother present - not initiate; Included modelled phases prior to free play • 7 X 3 minutes of free play observation • Scored using scheme developed for the study and described in (see Appendix A) • Pass or fail: Seven steps of object transformations 	<p>Percentage of children showing imitative pretending following modelling:</p> <p>Group 2 (21-25 months of age):</p> <ul style="list-style-type: none"> • Pretended to use toy cup or toy telephone as if the real counterpart (Step 1): 96% • Transformed either a toy banana or shell into telephone or cup (Step 2): 75%
<p>Largo & Howard (1979)</p> <p><i>“Developmental Progression in Play Behavior of Children between Nine and Thirty Months. I: Spontaneous Play and Imitation”</i></p>	<p>9,12,15,18,21,24,27 and 30 months (within two weeks of age)</p>	<ul style="list-style-type: none"> • Cross-sectional • 85 children (16 at each age) • 43 children seen twice • “Predominantly middleclass”, white, two parent households 	<ul style="list-style-type: none"> • Laboratory; Standardized sequence; 12 sets of toys presented; Seated at a table; Mother present - not interfere • 25 minutes observation • Coded using scheme developed for the study, see Appendix A • “Representational play I: The object again is used in a functionally appropriate way, but with the play directed toward the doll or another 	<p>Percentage of children demonstrating representational play:</p> <p>Representational play I:</p> <ul style="list-style-type: none"> • 9 months: 1 child • 18 months of age: 100% • 21 months of age: 100% • 24 months of age: 100% • 27 months of age: 100% <p>Substitution (symbolic play) During first half of the third</p>

			<p>person, e.g., The child feeds the doll with a spoon; the child brushed the doll's hair; Feeding doll with spoon; Giving cup to doll; Wiping doll's face; Brushing doll's hair; Holding telephone to doll's ear" (p. 303)</p>	<p>Year: 5% (n= 4)</p> <ul style="list-style-type: none"> Symbolic play was observed in only four children
<p>Lewis & Ramsay (2004)</p> <p><i>"Development of Self-Recognition, Personal Pronoun Use, and Pretend Play During the 2nd Year"</i></p>	<p>Children seen at 15, 18, and 21 and 24 months</p>	<ul style="list-style-type: none"> Longitudinal 66 children Mostly middle-class Mostly from two parent households 	<ul style="list-style-type: none"> Laboratory; Toy set in standard arrangement on the floor; Mother present - no prompt; Free play - modelling-free play 6-minute total observation Coded as: "Exclusively self-directed pretend play Mixture of self- and other-directed pretend play" (p. 1824) <p>(See Appendix A for further details of coding scheme developed for this study)</p>	<p>Percentages of children showing pretend play types:</p> <p>15 months: exclusively self-directed:36 % 18 months: exclusively self-directed:17 % 21 months: exclusively self-directed:12 % 24 months: exclusively self-directed:6%</p> <p>15 months: exclusively mixture:48% 18 months: exclusively mixture:70 % 21 months: exclusively mixture:70 % 24 months: exclusively mixture:80%</p> <p>15 months: exclusively no play:16% 18 months: exclusively no play:13 % 21 months: exclusively no play:18 % 24 months: exclusively no play:14%</p>
<p>Lowe (1975)</p> <p><i>"Trends in The Development of Representational Play in Infants from One to Three Years-An Observational Study"</i></p>	<p>12, 15, 18, 21, 24, 30 and 36 months (within 3 weeks of age)</p>	<ul style="list-style-type: none"> Cross sectional 244 from London (n= 30 - 42 children in each age group) "Reasonably Representative of the population" (p. 34) (in terms of father's education 1966) 	<ul style="list-style-type: none"> Four toy sets; Toy sets presented in standard arrangement on the table; Left to play spontaneously; Mother present; Up to 30 minutes observed (Inc. warm up) Coding scheme developed for the study, see Appendix A Representational play with miniature toys included feeds 	<p>Percentage of children displaying types of representational play: Situation 1 (toys: doll, spoon, cup, saucer, comb, brush)</p> <p>Relates spoon to cup or saucer, e.g. places spoon in cup; stirs; "picks up food" from saucer:</p> <ul style="list-style-type: none"> 18-month-olds: 100% 21-month-olds: 97% 24-month-olds: 97%

			self, feeds other person, feeds doll	<p>Feeds self (with spoon, or "drinks" from cup):</p> <ul style="list-style-type: none"> • 18-month-olds: 66% • 21-month-olds: 60% • 24-month-olds: 35% <p>Feeds other person:</p> <ul style="list-style-type: none"> • 18-month-olds: 16% • 21-month-olds: 14% • 24-month-olds: 15% <p>Feeds doll:</p> <ul style="list-style-type: none"> • 18-month-olds: 32% • 21-month-olds: 46% • 24-month-olds: 50%
Lyytinen, Poikkeus & Laakso (1997)	Mean age: 18 months and 1 week	<ul style="list-style-type: none"> • Part of longitudinal study • 110 toddlers from Finland • Sample was representative of Finnish population in terms of socioeconomic status 	<ul style="list-style-type: none"> • Laboratory; Three sets of miniature toys from Symbolic Play Test (SPT; Lowe & Costello, 1976) standard arrangement • Total Observation time 10 minutes • Coded using Symbolic Play Test SPT; Lowe & Costello, 1976) and also extra coding of symbolic play from Belsky & Most (1981) and Tamis- leMonda & Bornstein, (1989;1994) • Symbolic play classified as (1) self-directed pretence (2) other-directed pretence (3) substitution pretence 	<p>Percentages of children showing pretend play types:</p> <p>18-month-old data:</p> <p>Stirs in cup, "picks up food" from saucer: 55 %</p> <p>Feeds self (with spoon, or 'drinks' from cup): 68.5%</p> <p>Feeds doll: 34.8%</p> <p>Feeds other person: 24.3%</p> <p>Substitutive use of blanket: pillow (e.g., wipes face, mouth): 8.4 %</p>
Lyytinen, Laakso, Poikkeus & Rita (1999)	Seen at 14, 18 months, 24 months	<ul style="list-style-type: none"> • Longitudinal • 171 toddlers from Finland • 75% Mothers: advanced training in vocational school 	<ul style="list-style-type: none"> • Laboratory; Three sets of miniature toys from SPT-standard arrangement; • Total Observation time: 10 minutes 	<p>Percentages of children showing pretend play types:</p> <p>18-month-old data:</p>

<p><i>“The Development and Predictive Relations of Play and Language Across the Second Year”</i></p>	<p>Symbolic play only measured at 14 and 18 months</p>	<ul style="list-style-type: none"> • 15.2%: university degree • Mean mothers age: 30 years (<i>SD</i>=4.3) 	<ul style="list-style-type: none"> • Symbolic Play Test SPT; Lowe & Costello (1976) • Non-symbolic/symbolic play also analysed separately: • Symbolic play classified as (1) self-directed pretence (2) other-directed pretence (3) substitution pretence 	<p>“Stirs in cup, ‘picks up food’ from saucer”: 59%</p> <p>“Feeds self (with spoon, or ‘drinks’ from cup)”: 70.8%</p> <p>“Feeds doll”: 35.7%</p> <p>“Feeds other persons” 26.3 %</p> <p>“Symbolic handling of doll (e.g., kissing, hugging, walking etc.)”: 32.7 %</p> <p>“Substitutive use of blanket: pillow (e.g., wipes face, mouth)” - 11.1 %</p> <p>“Moves truck or trailer about”: 88.9%</p>
<p>McCune (1995)</p> <p><i>“A Normative Study of Representational Play at the Transition to Language”</i></p>	<ul style="list-style-type: none"> • Cross sectional sample: • 6 Children at each age from 8 and 24 months • Longitudinal sample: 8/10 months at beginning – followed until 24 months + 	<ul style="list-style-type: none"> • Cross-sectional and Longitudinal • 102 cross-section participants • 10 longitudinal participants • Mostly middle class (education/ employment/ location) 	<ul style="list-style-type: none"> • Home visits; Toys arranged on/around a bucket on the floor; Mother present - not initiate, respond naturally • 10 minutes observation with no interruptions • Symbolic/representational play coded using scheme described in see Appendix A 	<p>Percentage of children displaying pretend play:</p> <p>Longitudinal sample:</p> <p>22 months: 100% had displayed pretend play (all displayed highest level 5)</p> <p>Cross-sectional sample Symbolic Stage I</p> <ul style="list-style-type: none"> • 18 months: 100% (<i>n</i>=6) • 21 months: 100% (<i>n</i>=6) • 24 months: 100% (<i>n</i>=6) <p>Level 5 Hierarchical Pretend (included substitution actions)</p> <ul style="list-style-type: none"> • 18 months: 83% (<i>n</i>=5) • 19 months: 16.6% (<i>n</i>=1)

McInnes & Elpidoforou (2018) "Investigating and Learning From Toddler Play In a Children's Museum"	Mean: 22 months Range: 0 to 36 months	<ul style="list-style-type: none"> • Descriptive • Cross-sectional • 50 toddlers observed • 100 parents completed questionnaires • Sociodemographic characteristics not reported 	<ul style="list-style-type: none"> • Mixed methods; Naturalistic observations in museum; Parent Questionnaires • 30-minute observation time; 5-minute time sampling used (type of play recorded every 5 minutes) • Used observation schedule designed for the study: 'Toddlers Play in Museums Taxonomy' (To.P.Mu.T) • Coded types of play including role play; symbolic play; imaginative play; pretend play; fantasy play; rough and tumble (see Appendix A) 	<ul style="list-style-type: none"> • 21 months: 50% (n=3) • 23 months: 50% (n=3) • 24 months: 83% (n=5) <p>Percentage of children who engaged in pretend play:</p> <ul style="list-style-type: none"> • Total: mean age: 22 months <ul style="list-style-type: none"> ○ Pretend play: 40% (n=20) ○ Role play: 40 % (n=20) • Younger than 22 months: <ul style="list-style-type: none"> ○ Pretend play: 21% (n=5) ○ Role play: 8% (n=2) • Older than 22 months <ul style="list-style-type: none"> ○ Pretend play: 58% (n=15) ○ Role play: 46% (n=12) • Significant difference between younger and older children
Le Normand (1986) "A Developmental Exploration of Language Used To Accompany Symbolic Play in Young, Normal Children (2-4 Years Old)"	Onset age: <ul style="list-style-type: none"> • 2 years old (plus or minus 2 weeks) • Seen at 3 monthly intervals 	<ul style="list-style-type: none"> • Longitudinal • 10 children in France • College educated and middle income 	<ul style="list-style-type: none"> • Home visit; Bag containing 21 miniature toys given to child; Mother present – "supportive and responsive" p.124) • 20-minute observation time • Level of symbolic play coded using coding system developed by the author (see Appendix A) 	<p>Percentage of children showing representational play:</p> <p>24 months: 80% (n=8) 27 months: 100 % (n=10)</p>
Power, Chapieski, & McGrath (1985) "Assessment of Individual Differences	Mean: 17.3 months Range: 12 to 24 months	<ul style="list-style-type: none"> • Short term longitudinal (two testing days two weeks apart) • Nineteen infants • Middle-class families 	<ul style="list-style-type: none"> • Took place in day care centre; Seven tasks-including a pretend session • 6-minute pretend session • "Played with a cup, a pitcher, a spoon, a plate, a small 	<p>Percentage of children showing pretend play:</p> <p>Level 2 (or higher) pretend play: 100% Level 3 pretend play:84.2%</p>

<i>in Infant Exploration and Play"</i>	7 Children above 18 months, oldest child 23.93 months	<ul style="list-style-type: none"> All Mothers had full time jobs 	<p>baby bottle, a telephone, a doll, and a doll's chair" (p. 976)</p> <ul style="list-style-type: none"> Pretend play coded using Nicolich, 1977; McCune-Nicolich, 1981; Hill & McCune-Nicolich system <p>Level 2 (self-pretend) e.g., child pretends to drink from empty cup</p>	
Russell (1981) <i>"The Development of Symbolic Play From Ages One To Three: A Longitudinal Study of The Mother-Child Play Interaction"</i>	Three time points: 1: 12.68 months (SD=.75) 2: 20.48 months (SD=.81) 3: 34.45 months (SD=.1.87)	<ul style="list-style-type: none"> Longitudinal 25 children at all waves Two parent families, mix of father occupations but majority skilled jobs 	<ul style="list-style-type: none"> Laboratory; Mother present – play as normal 15-minute observation Coded using a scheme created for the study, see Appendix A 	<p>Percentage of children showing symbolic play:</p> <p>Session 1 (12-14 months): 75 %, (29.2 %: replica toy only)</p> <p>Session 2 (20-22 months):100% (4.2 %: replica toy only)</p>
Shimauzda & Sano (1984) <i>"Pretend Actions and Utterances in the Play of Thirty-Month-Olds"</i>	30-month-old	<ul style="list-style-type: none"> Descriptive study 16 Japanese Children Middle-class families 	<ul style="list-style-type: none"> Laboratory; Mother present - no initiation but encouraged to play; toys in standard pattern 15 minutes observation Pretend actions and utterances coded with adaption of Fenson (1984) - see above 	<p>Percentage of children showing pretend play types:</p> <p>Self-pretend actions: 100% Self-pretend utterances:88% Object-directed actions:100% Object-directed utterances:100% Passive other action:56% Passive other utterances:50% Substitution Action:100% Substitution Utterance:69%</p>
Shimada, Kai, & Sano (1981) <i>"Development of Symbolic Play in Late Infancy"</i>	Tested on even months from 12 to 24 months of age	<ul style="list-style-type: none"> Longitudinal 18 Japanese children Middle-class families 	<ul style="list-style-type: none"> Laboratory session; Three toy sets, standard arrangement of toys on the floor; Mother present - no initiation but encouraged to play 15 minutes spontaneous play observed (five minutes per toy set) 	<p>Percentage showing symbolic play:</p> <p>14 months: 100 % had showed symbolic play towards self by this age</p> <p>22 months: 100 % had showed substitute object use by this age</p>

Spencer & Meadow-Orlans (1996)	3-time points: Within 2 weeks of: <ul style="list-style-type: none"> 9 months of age 12 months of age 18 months of age 	<ul style="list-style-type: none"> Longitudinal – comparison of hearing/deaf children Mothers: relatively high numbers of years of education 15 children in each group (3 groups) 	<ul style="list-style-type: none"> See Appendix A for coding scheme developed, included: Self (<i>Symbolic play directed towards the subject himself or herself</i>) <ul style="list-style-type: none"> Drinking from a cup Laboratory; Mother-infant dyad play; free play with toy set; Mothers asked to play “as naturally as possible” (p. 3179) Length of observation: 9 & 12 months of age: 15 min. 18 months of age: 20 min. Play coded based on McCune-Nicolich (1983); Belsky and Most (1981) and Fenson and Ramsay (1980). see Appendix A) Three levels: Manipulative; Relational; Representative (with sublevels) 	<p>Percentage of children showing representational play:</p> <p>Hearing children, 18 months of age: 100% (n=15)</p>
Tamis-LeMonda & Bornstein (1991)	13 and 20 months	<ul style="list-style-type: none"> Longitudinal 45 children “Middle- to upper-socioeconomic status households” (p. 146) 	<ul style="list-style-type: none"> Home visits; Toy set placed on floor; Mother present - behave as ordinarily would (research investigating Toddler and Mother play) 15-minute observation Eight-level play scale (see Appendix A) 	<p>Percentage of children showing symbolic play:</p> <p>20-months-old: 100% (I calculated this from the reported range of symbolic acts performed)</p>
Quittner, Cejas, Wang, Niparko & Barker (2016)	Hearing children group Baseline age: <ul style="list-style-type: none"> Mean: 2.3 years (SD=1.1) 	<ul style="list-style-type: none"> Longitudinal, group comparison of deaf and hearing children 188 deaf children; 96 hearing children 	<ul style="list-style-type: none"> Laboratory; Parent not interact; Structured solitary play; Sets of toys presented – baseline (doll; pillow; wooden block; blanket), other time points one of three sets Inc. dish, spoon, aeroplane (randomised choice) 	<p>Percentage of children displaying pretend play:</p> <p>Baseline: Hearing children: 49%, n = 47</p>

<p><i>Deaf and Hearing Children: Longitudinal Effects of Access to Sound on Early Precursors of Language"</i></p>	<p>Symbolic play data collected at baseline, and 6,12,24 months later</p>	<ul style="list-style-type: none"> Nationally representative sample of young deaf children Not nationally representative of hearing children: 62% female, 92% (89) of Mothers had a least a college degree 	<ul style="list-style-type: none"> 5-minute observation at each time point Adaptation of Belsky and Most's (1981) coding scheme used to code behaviours as symbolic vs. non-symbolic Symbolic play had to include substitution of an object in a child's solitary play (e.g., a block as a bed) 	<p>Cochlear implant: 37%, <i>n</i> = 69 By the fourth assessment: Hearing children: 94%, <i>n</i> = 91 Cochlear implant: 77%, <i>n</i> = 144</p>
<p>Ungerer, Zelazo, Kearsley & O'Leary (1981) "Developmental Changes in the Representation of Objects in Symbolic Play from 18 to 34 Months of Age"</p>	<p>Four age groups:</p> <ul style="list-style-type: none"> 18 months of age 22 months of age 26 months of age 34 months of age 	<ul style="list-style-type: none"> Cross-sectional 61 children <i>n</i> = 16 - 18 per group Caucasian and mostly middle class 	<ul style="list-style-type: none"> Laboratory; 31 item toy set; Predetermined order of toys; Primary caregiver in the room; Free play- Modelled session - Free play 16 minutes in total; (Two X 8 minutes free play) Enactments coded into one of four symbolic play categories (see Appendix A) 	<p>Percentage of children showing symbolic play:</p> <p>Most common category: 1) High physical support with action</p> <ul style="list-style-type: none"> The child picks up a teacup, says "Tea," and then proceeds to drink from the cup while making drinking sounds <ul style="list-style-type: none"> 18-month-olds: 50% 22-month-olds: 62 % 26-month-olds: 88 % 34-month-olds: 88 %
<p>Ungerer Zelazo, Kearsley & Kurowski (1979) "Play as a Cognitive Assessment Tool"</p>	<p>Four age groups:</p> <ul style="list-style-type: none"> 18 months of age 22 months of age 26 months of age 34 months of age 	<ul style="list-style-type: none"> Cross-sectional 16 children in each group Mostly middle class 	<ul style="list-style-type: none"> Laboratory; Unstructured free play; Arc of toys; Mother present-not initiate but could respond; Observed through mirror. 15-minute observation Behaviours grouped into one of four categories including: 4. Symbolic Play: Three different types of symbolic acts were recorded. 	<p>Percentage of children showing symbolic play:</p> <ul style="list-style-type: none"> From 18 - 22 months: 84 % 26 months: Not noted 34 months: 100%

			<ul style="list-style-type: none"> a. Substitution: b. Agent: c. Imaginary: (e.g., to pour imaginary sugar from a bottle into a cup) 	
Valentino, Cicchetti, Toth, & Rogosch (2011) "Mother-Child Play and Maltreatment: A Longitudinal Analysis of Emerging Social Behavior From Infancy to Toddlerhood"	Time 1: 11.0 to 14.9 months (<i>M</i> =12.6 months) Time 2: 25.8 to 31.1 months (<i>M</i> = 27.5 months)	<ul style="list-style-type: none"> • Longitudinal • Time 1: <i>n</i>=130 • Time 2: <i>n</i>=78 • "78 infants from low-socioeconomic status (SES) maltreating families and 52 infants from low-SES non-maltreating families," (p. 1283) 	<ul style="list-style-type: none"> • Laboratory; Toys in centre of the room; Mother present, play as normally would • 15-minute observation • Coded using scheme adapted from Belsky and Most (1981) & Nicolich (1977) Included: 5) Pretend-Self 6) Pretend-Other (highest level) 	<p>Percentage of children showing pretend play:</p> <p>51% of the sample</p>
Watson & Jackowitz (1984) "Agents and Recipient Objects in the Development of Early Symbolic Play"	Group 1 <i>M</i> =16.8 months Range:14 to 19 months Group 2 <i>M</i> =21.9 months Range 21 to 25 months	<ul style="list-style-type: none"> • Cross-sectional • 48 "normal, white, middle-class children", • 24 children in each group 	<ul style="list-style-type: none"> • Laboratory session; Mother present - not initiate; Included modelled phases prior to free play • 9 X 3 minutes of free play observation (each following modelling procedure) • Scored as pass or fail for each step • Coding based on Watson & Fischer (1977); Jackowitz & Watson (1980) schemes 	<p>Percentage of children showing imitative pretend play following modelling in free play:</p> <p>Overall:</p> <p>Step 1 (Self-directed - pretending to talk using toy telephone): 88% Step 2a (Transforming toy banana into telephone and pretending to talk into it): 75% Step 2b (Doll directed-pretending doll is talking on the toy telephone):40%</p>
Watson & Fischer (1977) "A Developmental Sequence of Agent Use in Late Infancy"	Group 1 Mean: 14.0 months Group 2 Mean: 19.4 months Group 3: Mean: 24.2 months	<ul style="list-style-type: none"> • Cross sectional • 36 "normal, white, middle-class infants" • 12 infants in each group 	<ul style="list-style-type: none"> • Laboratory; Six toys on floor - standard semicircle arrangement; Mother present - not initiate; Included a modelled phase prior to second free play • Started with a 3 min familiarization free play phase 	<ul style="list-style-type: none"> • No infants showed any pretending during the familiarization phase <p>Percentage of children displaying pretend play after modelling:</p> <p>Overall: 77.8% (<i>n</i>=28)</p>

Williams, Reddy & Costall (2001) "Taking a Closer Look at Functional Play in Children with Autism"	TD group • Range: 11 to 24 months • Mean: 16.6 months	<ul style="list-style-type: none"> • Group comparison • 15 typically developing • No other socio-demographic information noted 	<ul style="list-style-type: none"> • 8 minutes free play (following modelling) • Scored using scheme developed for the study and described in (see Appendix A) • Coded for action, e.g., pretend eating, sleeping, washing, other and agent e.g., Passive (<i>Treated the object as a mere recipient</i>) • Fed the doll by merely stuffing food into its mouth • Home visits; Standard toy set in random in front of the child on the floor; Mother present - not instruct and not demonstrate • 15 minutes observation - 10 minutes analysed • Coded using behavioural categories created for the study (see Appendix B) • Functional play – but similar to other early pretend play coding schemes- includes Elaborated functional play - <i>Functional use of multiple objects</i> <ul style="list-style-type: none"> • Tipping a jug over a cup, as if pouring something into it Elaborated functional play - <i>Functional act supported by appropriate vocalization/gesture</i> <ul style="list-style-type: none"> • Drinking from a cup and throwing head back in an exaggerated drinking gesture 	<p>19-month-olds: 75 % (n=9)</p> <p>24-month-olds: 100% (n=12)</p> <p>Percentage of children displaying Elaborated functional play (akin to early pretend play coding):</p> <p>TD group: 73.3% (n=11)</p> <ul style="list-style-type: none"> ○ No breakdown by age
Wilson et al. (2017)	TD group	<ul style="list-style-type: none"> • Group comparison (Autism, DD, TD) 	<ul style="list-style-type: none"> • Naturalistic retrospective video records - Videotapes from parents filming home activities; 	15 - 18 months of age group

“Object Play in Infants With Autism Spectrum Disorder: A Longitudinal Retrospective Video Analysis”

- Time 1: 9-12 months
 - Mean: 10.68 months
 - Time 2: 15-18 months
 - Mean: 16.34 months
- 17 TD infants at Time 2
 - Longitudinal (two-time points)
 - 6% of “typically developing” children, Mothers had no college degree (therefore, high percentage with degree), 37 % of children with autism, Mothers had no college degree

“Various special events (e.g., birthdays) and daily occupations (e.g., bath time)” (Baranek et al.,2005) p. 23)

- Maximum of two 5-minute segments observed and coded **(10-minute total)**
- Coded using scheme created for Baranek et al.,2005 (Time 1 of the study: See Appendix B) – ADAPTED because functional and symbolic play was displayed minimally
- **Four levels of object play coded: Level (4) Functional and Symbolic play** (all sublevels of functional and symbolic play combined, *including using objects as intended and using objects in pretend play*).

Percentage of children displaying Level 4 functional and symbolic play:

- Typically developing (TD) group: **41%**
- Developmental disorders (not autism) (DD) group: 13 %
- Autism group: 9%

Note. TD = ‘Typically Developing’

2.2.3 Key findings from the review of observational studies of free play

I identified forty-five studies that reported the percentages, or provided information from which the percentages could be calculated, of children between 18 to 30 months of age showing pretend play in free play situations (meeting the criteria described previously). Table 2.1 shows all studies identified within the 18- to 30-month age bracket. Seven studies (16%) were identified that showed fewer than 50% of children were reported to show pretend play across the entire 18 to 30-month age range.

The subsequent calculations investigated the percentages of children showing pretend play within the 24 to 30 and 18- to 23-month age brackets; some of the studies from Table 2.1 were excluded from the subsequent calculations for not meeting the following calculation inclusion criteria. Studies were only included in the following investigations when one of the following criteria was met: 1) the mean age was reported and fitted into the specific age categories to be studied (e.g., Charman et al., 2000, $M = 20.1$ months; fitted into the 18-23 month age bracket category); 2) specific age bands were reported that clearly fitted into the age categories (e.g., Fenson, 1984, *20 month* category; Howes, 1985, *21-23 months* category); 3) I could work out the percentages from the reported data on individual children at different ages (e.g., Daunhauer et al., 2010; Power et al., 2000); 4) 100% of children were reported to engage in pretend play within an age range that included the specific age category to be investigated (e.g., Fein et al., 1982 included an age category of 19-28 months and reported that 100% of children pretended; thus, the study was included as showing 100% of children aged between 18 to 23 months pretended and 100% of children aged between 24 to 30 months pretended).

Of the seven studies that showed fewer than 50% of children were reported to show pretend play across the entire 18- to 30-month age range, four were excluded from the subsequent calculations. Exclusion occurred because the mean ages of the children in the

studies were outside of specific age bracket categories (e.g., Wilson et al., 2017 was included in the original literature review because the age range of the children extended to 18 months of age, but excluded because the mean age of the children was 16.34 months) or because the age categories/age range reported for the children extended beyond the ages to be investigated in this review, with no possibility of calculating data for the specific 24-30 and 18-23 month age brackets (e.g., Gaskins, 2000, Goncu et al., 2000; Brèdikytė et al., 2015). With regards to the remaining three studies that reported fewer than 50% of children showing pretend play, the low percentages in the McInnes and Elpidoforou (2018) study may be explained by the research being carried out within a museum setting; however, for children above 22 months of age, the percentage of children showing pretend play was above 50% (I used the mean age data for the subsequent calculations). Possibly 22 months of age is a key developmental period for the emergence of pretend play. The two other studies reporting fewer than 50% of children showing pretend play, Quittner et al. (2016) and Daunhauer et al. (2010) are discussed in section 2.2.4; the sample of children from Daunhauer et al.'s (2010) study were residing in an orphanage. Of note, of the four children aged 24 months and above studied by Daunhauer et al. (2010), 50% pretended. However, we cannot generalise from a sample of four children.

2.2.3.1 Do the ‘vast majority’ of children between 24 to 30, and 18 to 23 months of age show pretend play in free play sessions? Westby (1980; 1990; 2000) used the criteria of 80% of children demonstrating a behaviour when developing the sequential categories for the Symbolic Play Scale (described later in this chapter). Therefore, I considered the number of studies that reported 80% or more children showing pretend play in free play observations as indicating that the vast majority of children in those samples showed pretend play. I additionally explored studies where fewer than half of the children were reported to pretend play (those studies are discussed above). The remaining category

was for studies reporting between 50-79% of children showing pretend play in free play observations.

The percentage of children showing pretend play per se was not reported by some studies. Alternatively, some studies reported the percentage of children showing different types of pretend play (or sometimes items not specially termed *pretend play*). In these instances, I drew on the ideas set forth in Chapter 2, Section 1 about what constitutes an early pretend act and then selected the highest reported percentage from those acts. For example, Lowe (1975) reported that the action *relating spoon to cup (places spoon in cup, etc.)* was the action demonstrated by the highest percentage of children; however, this action does not necessarily indicate any non-literal or ‘as if’ element in the play activity and could occur during exploration (i.e., be afforded solely by the physical properties of the object). The next category, *feeds self (with spoon, or “drinks” from cup)* indicates an early pretend play act, with the child behaving as if there was food present, or performing playful non-literal drinking (although the operational definition doesn’t necessarily define the pretend element of the action). Similarly, *feeds doll* indicates an early pretend act, with the child either behaving as if there is food, performing non-literal feeding, or attributing animacy to the doll.

2.2.3.1.1 Do the ‘vast majority’ of children between 24 and 30 months show pretend play in free play sessions? For the age category of 24 to 30 months, 21 studies were identified. Of the 21 studies, 76% reported that pretend play was observed in the vast majority of children. Around one fifth of studies reported between 50-79% of children showed pretend play and one study reported fewer than half of children showed pretend play during the free play observations. Figure 2.1 depicts the number of studies.

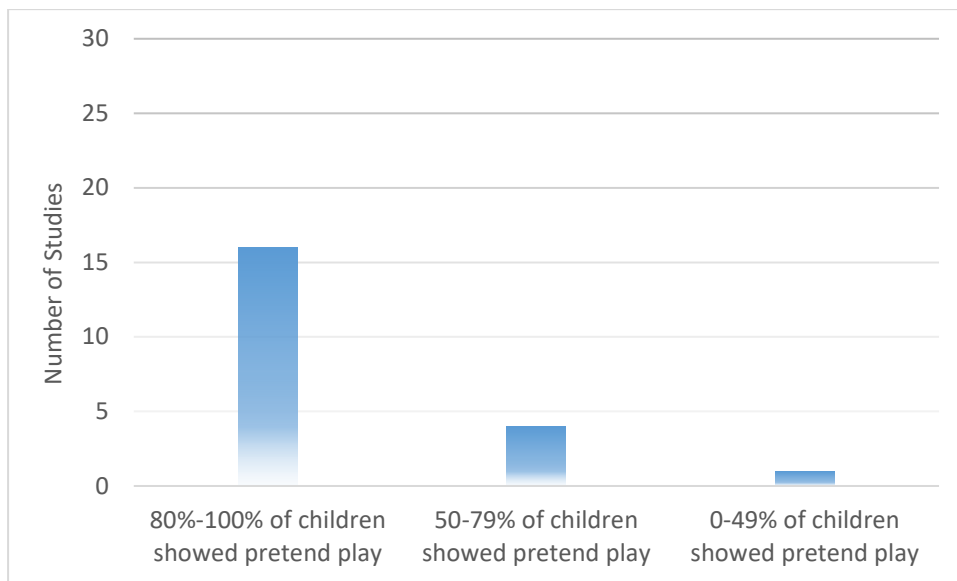


Figure 2.1. Number of studies that report 80-100%, 50-79% or 0-49% of children (24 to 30 months of age) showing pretend play during free play observations

2.2.3.1.2 Do the ‘vast majority’ of children between 18 and 23 months show pretend play in free play sessions? Thirty-one studies were identified for the age category of 18 to 23 months; 65% of studies reported that pretend play was observed in the vast majority of children. Just under a third (29%) of studies reported between 50-79% of children showed pretend play and 6% of the studies reported that fewer than half of children showed pretend play during the free play observations. Figure 2.2 depicts the number of studies.

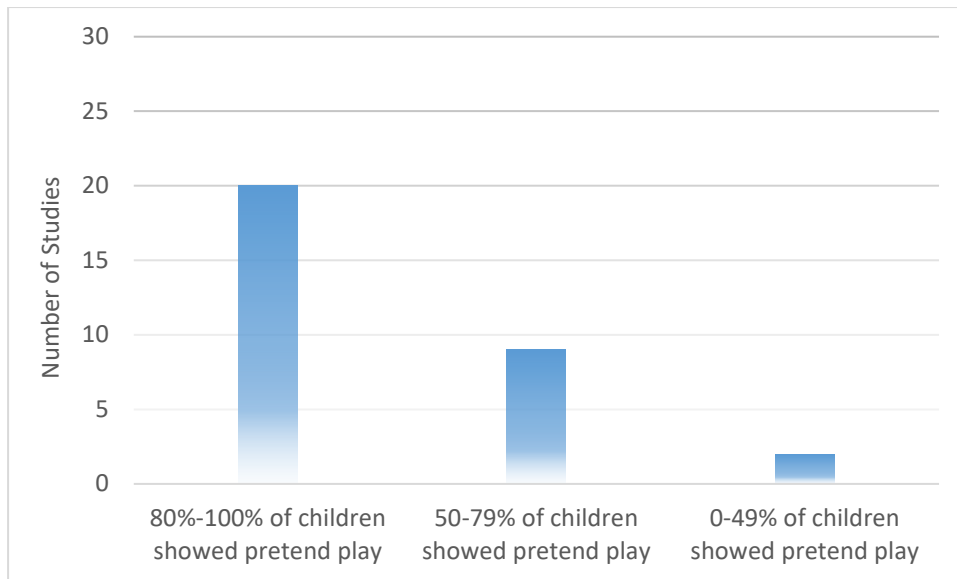


Figure 2.2. Number of studies that report 80-100%, 50-79% or 0-49% of children (18 to 23 months of age) showing pretend play during free play observations

2.2.3.2 Conclusion from the review of observational studies of free play. As expected, it was most common for studies to show that the vast majority of children at 24 months of age up to 30 months of age (in samples meeting the criteria described earlier) displayed pretend play. It was also most common for studies to show that the vast majority of children aged between 18 to 23 months displayed pretend play. However, there were individual differences reported, especially within the 18 to 23-month age bracket, with around 35% of studies reporting that fewer than 80% of children showed pretend play (the criteria used by Westby, 1980, described earlier). After 24 months of age, this percentage dropped, with 24% of studies showing fewer than 80% of children showing pretend play. As an absence of pretend play during free play observations is sometimes used as a marker of delay or disorder for children in the second and third years of life, further investigation of the individual differences identified in this review is required, especially within the 18- to 23-month age bracket.

2.2.4 Can the Data from the Samples of Children Previously Studied Be Generalised to a Wider Population?

I found that the previous observational studies on early pretend play often investigated small samples of children. Furthermore, the studies often focused on middle class samples of children, often from well-educated homes, although occasionally sociodemographic characteristics were not reported. This will be an issue when attempting to generalise the findings to wider populations. In British samples, there appears to be a lack of research with samples of children who are nationally representative in terms of social class, the mother's education, and mother's age. As shown in Table 2.1, Lyytinen et al. (1997) reported that the sample of children studied was nationally representative of the Finnish population and Quittner et al. (2016) report that the study was nationally representative of the USA deaf population; however (as shown in Table 2.1), it appears not to be representative of the hearing population in the USA. The sample was however more diverse than some others reviewed, and it is therefore interesting to note that at a mean age of 27 months only 49% of hearing children displayed pretend play. Lowe (1975) reported that the sample she studied was "reasonably representative" of the English and Welsh population; in terms of father's occupation in 1966, but the children were studied cross sectionally rather than longitudinally. It is of note that the findings from nationally representative populations (Lyytinen et al., 1997 and Lowe, 1975) indicated that not all children showed pretend play (below 80% of children); these samples were more diverse than many others studied. However, this similarity in findings may be explained by the fact that these studies used similar toys and observational codes; specific types of pretend play percentages were reported, rather than overall rates of pretend play.

Cultural as well as socioeconomic differences are evident. For some of the studies shown in Table 2.1 that include samples of children from non-middle class, or non-western

cultural settings, e.g., Gaskins (2000); Goncu, Mistry and Mosier (2000); Daunhauer et al. (2010); and Valentino et al. (2011) we see that smaller percentages of children are reported to engage in pretend play. The conclusion from this literature review is that continued investigation of the percentage of children displaying pretend play when observed in natural environments, in nationally representative samples of children in the second year of life, is needed. This is one aim of the current thesis.

2.2.5 Limitations of the Review's Inclusion Criteria

I attempted to investigate previous research on early pretend play quantitatively, but it was somewhat difficult to compare previous findings. Some studies report children's mean ages (with sometimes wide age ranges), while others looked at specific age brackets (and report no mean age). Furthermore, as discussed, the different labels used by different researchers for similar behaviours makes comparisons difficult; it may be that some behaviours included in this review are not pretend play. The percentage of children displaying *any* pretend play was reported by some studies, while others reported data on specific pretend play behaviours (or a combination of behaviours). It should be considered that where studies report on specific behaviours, the numbers of children showing *any* pretend play may be higher than what is reported for specific behaviours, i.e., different children may show the different behaviours. The issues noted for this comparison of observational studies highlights the need for more robust findings on the emergence of pretend play, with larger numbers of children representative of general population studied. There is a need for clearer operational definitions of pretend actions to code behaviours, and for the age categories and mean ages to be reported, from studies of children followed longitudinally. The current thesis aims to address this need.

2.2.6 Additional Studies Using Observations of Instructed or Prompted Pretend Play, Carried Out in The Laboratory with Children Between 24 to 30 And 18 to 23 Months of Age

The empirical investigations within the thesis are carried out using informant reports and observations of free play (and the agreement across the measures is explored); therefore, the main focus of this literature review is to highlight the gaps in the literature with studies using these methods. However, earlier research using instructional tasks, and experimental trials/conditions, has also been used to investigate the emergence of pretend play and advance the theory on the development of pretend play. An extensive review will not be reported as such methods are not used within the current thesis, but it appears there are some discrepancies with the percentages of children reported to show pretend play following explicit instructions to do so.

In the context of a longitudinal study of Australian infants, investigating the emergence of mirror self-recognition, pretend play & imitation, Nielsen and Dissanayake (2004) asked 98 children aged between 12 and 24 months to perform a series of actions in the laboratory investigation: “Can you have a drink?” and “This is Dolly. She’s thirsty. Can you give her a drink?” (p. 347). Pretend drinking and pouring were then coded. The age of pretend play emergence was reported to be around 18 months of age, when 85% of infants started to demonstrate pretend play. The authors noted at the time of publication (2004) no previous study had explored the emergence of the three skills longitudinally; however, as with the majority of research in this area, the study was carried out with predominantly middle class participants.

It is not the case that all studies employing verbal suggestions to pretend have found that the vast majority of 18-month-old children show pretend play. In work attempting to answer theoretical questions about the symbolic nature of early object play, Tomasello and

colleagues (1999) investigated children's symbolic skills in relation to adult modelling and verbal scripts. Production of symbolic play was investigated in a three-phase paradigm comparing 1) two minutes of free play 2) demonstration phase and 3) verbal phase. The paradigm involved a stuffed sock, designed to symbolise a doll, and Lego bricks designed to symbolise a car (along with a selection of other toys, including a spoon, toy man, tunnel). In the final verbal phase an experimenter voiced a verbal script alongside placement of the toy set: while rocking the sock doll, saying "My dolly is tired; she's going to bed" (Tomasello et al., 1991, p. 577); while pushing the Lego car and making an engine sound, saying "The man is going for a ride in the car" (Tomasello et al., 1999, p. 577). Actions such as *spoon to doll* were coded as symbolic productions. Children aged 18, 26 and 35 months were studied, and mean production scores were reported across the ages and the three conditions. Data on individual children's symbolic production was additionally provided, but not specifically for each phase of the investigation (the reason the study is absent from Table 2.1) and only for children additionally taking part in a second comprehension of symbols study. Of the seven 18-month-old children who fitted these criteria, 57% ($n=4$) showed some symbolic production (it was not clear within which test phase). Furthermore, the behaviours were noted to be only fleeting and "generously scored", for example, "poking the sock-doll with the spoon, which was counted as 'feeding'" (p. 580). Of the 15 children who participated in both studies at 26 months of age, 80% ($n=12$) showed at least one symbolic production. As with most observational work on the emergence of pretend play, the sample sizes in this study were small, and the sample predominantly white and middle class.

Furthermore, not all work has shown that the vast majority of children in the 24- to 30-month age category show pretend play when instructed to do so. Frahssek and colleagues (2011) carried out an investigation of the validity of a newly developed assessment of pretend play with 24- and 30-month old German children, stating that "the validity of pretend play

tests has rarely been considered” (Frahsek et al., 2011, p. 333). The assessment measure consisted of a five-part semi-structured pretend play scenario. Part 1 of the measure, *Drinking*, involves the researcher pretending to pour and asking the child “Now I pour some water into the cup. Can you have a drink?” (p. 334). A further section, *Elaboration*, scores children for self-initiating pretend play or elaborating on the requirements of the task. The authors noted that the Part 1 of their semi-structured pretend play task was based on Nielsen and Dissanayake’s (2004) paradigm described above. However, unlike Nielsen and Dissanayake’s (2004) findings, Frahsek and colleagues (2011) reported that only 40% of 24-month-old (range: 23.5 to 24.3 months) children carried out the experimenter’s request in response to “Now I pour some water into the cup. Can you have a drink?” (p. 334), while 53% of 30-month-old (range: 29.7 to 30.5 months) children passed the item. In the second section of Part 1 of the test, children were requested to give a doll a drink, “Look, this is Bibi. It’s very thirsty. Can you give it a drink?” (p. 334). This item was passed by 93% of the 30-month-olds, but by only 53% of the 24-month-old children (this was the highest percentage for any behaviour carried out by the 24-month-old children). Sociodemographic characteristics were not reported for this study.

As with the previous work using free play observations, there were individual differences reported across the studies, with not all children in the 18 to 23 months age category and not all children at beginning of the third year of life showing pretend play. It was not until around 26 to 30 months of age that the vast majority of children across the studies (i.e., above 80%) showed pretend play when instructed or verbally guided to do so. The differences in findings may be because of the different conceptualisations of what constitutes a pretend play act, or because certain studies requested an act, rather than suggested it; however, the Frahsek and colleagues (2011) and Nielsen and Dissanayake (2004) studies used similar paradigms and found different percentages, suggesting that alternative

reasons exist for the disparity in findings. Possibly children's receptive language skills were affecting children's pretend production, although this was not found by Frahsek and colleagues (2011), and the number of 18-month-old children showing pretend play in the Neilsen and Dissyanke (2004) study (also requiring receptive language) was relatively high. Nonetheless, it should be considered that a benefit of using observations of free play is that receptive language is not required to take part in the task.

2.2.7 Age-Normed Data for Pretend Play Assessment Instruments That Screen Children for Developmental Problems

The observational literature on the development of pretend play just reviewed has influenced the development of instruments designed to screen children for developmental problems. Pretend play assessment instruments (e.g., play scales, checklists, and standardised tests) often use observations of children's pretend play to assess if the play shown is in line with age-expected norms. The aim of the observations is to provide information on the child's developmental play level and insight into child's overall development (e.g., language; social communication; and cognitive development). Children's ability to show pretend play during observations is also part of "Level two: diagnosis and evaluation of autism" measures (Weeks, *n.d.*, p. 10). The Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord, Rutter, DiLavore, Risi, Gotham, & Bishop, 2012) is an example of this type of instrument and uses observations of children's pretend play to indicate a diagnosis of autism. The data used to provide the age norms for these instruments can supply further information on the ages at which most children engage in pretend play. I will now review such data.

While there are numerous play assessment scales and instruments, some do not include pretend, or symbolic play, categories specifically. Instead the focus of the instruments is more on the social aspects of play, e.g., Parten (1932); Penn Interactive Peer Play Scale (PIPPS; Fantuzzo et al., 1995). With some other instruments, only a small proportion of the rating

scale or test is concerned with pretend play, e.g., The Test of Playfulness (ToP; Bundy, 1997); Transdisciplinary Play Based Assessment (TPBA; Linder, 1993, as cited in Kelly-Vance et al., 2002); Developmental Play Assessment (DPA; Lifter, 2000); Play Observation Scale (POS; Rubin, 2001); The Play Assessment Scale (PAS; Fewell, 1986, as cited in Rutherford & Rogers, adapted, 2003). Other measures include composite categories that do not measure pretend play specifically, e.g., the Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP; Wetherby & Prizant, 2001; 2002) used as part of the FIRST words project, which features a question “Does your child pretend to play with toys (for example, feed a stuffed animal, put a doll to sleep, put an animal figure in a vehicle)? (Wetherby & Prizant, 2002, p. 1). The data are then analysed as part of *symbolic composite* which includes “use of objects” and “understanding of words” items (Wetherby & Prizant, 2001, p. 3). The following assessment instruments I will now discuss are comprised solely of pretend play items, or the observation of pretend play behaviour is a core element of the instrument, more so than the instruments previously noted.

2.2.7.1 The Revised Knox Preschool Play Scale (RKPPS; Knox, 1997; 2008). The RKPPS is a play scale instrument used to derive a ‘developmental play age’ with children aged 0 to 72 months of age. It is designed to be used in naturalistic observations of children’s play, with two observations of 30 minutes required, one observation of free play activity indoors and one observation of natural outdoor activities. Four dimensions of play are measured on the scale: 1) Space management 2) Material management 3) Pretence/symbolic 4) Participation. Each of the four play dimensions contains descriptions of what the child should be doing across nine age-normed brackets up to 72 months of age, e.g., 6 to 12 months, 24 to 30 months, 48 to 60 months. The observer marks on the scale the behaviours the child is performing, and that is used in calculating the child’s developmental play level. At 24 to 30 months, the pretend behaviours the child should show are: “personifies dolls,

stuffed animals, imaginary friends, portrays single character, elaborates daily events with details” (Knox, 1997, p. 48)

The scale was a revision of a previous play scale by the same author, The Knox Preschool Play Scale (PPS; Knox, 1968; 1974, as cited in Knox, 1997; Bledsoe & Shepherd, 1982), with the revision reported to be “based on current research in the development of play (Bergen, 1988; Linder, 1990; Rubin et al., 1983)” (Knox, 1997, p. 46); therefore it appears the development of the new instrument was not based on analysis of normative data. Indeed, the new scale was reported to “still need standardization, reliability and validity studies” (Knox, 1997, p. 50). The previous version of the scale had included year, not month, age brackets (e.g., 1 to 2 years, rather than 24 to 30 months). Data on age-norms existed for the previous version of the scale, The Knox Preschool Play Scale (PPS; Knox, 1968; 1974, as cited in Knox, 1997; Bledsoe & Shepherd, 1982) which included year age brackets (e.g., 1 to 2 years) but not age brackets differentiated by months (e.g., 24 to 30 months). For the original scale, Bledsoe and Shepherd (1982) reported on mean imagination scores but for the different year, and not month, age brackets. In an article in 2008, Knox commented that the scale “still needs additional standardization, reliability, and validity studies” (Knox, 2008, p. 68). Jankovich, Mullen, Rinear, Tanta and Deitz (2008) evaluated the validity and reliability of the revised scale, but only with children aged 36 to 72 months, and other researchers have reported data for autistic participants (e.g., Lee & Hinojosa, 2010). Therefore, the researchers assume that by 24 to 30 months of age most children should be showing pretend play; however, there are issues with the data used for deriving the age brackets split by months used on the most recent version of the scale.

Pretend play is first included on the scale within the 12- to 18-month age bracket, when the child should be “beginning pretending using self (i.e., feeds self with spoon)” and “pretend on animated and inanimate objects” (Knox, 1997, p. 47). At 18 to 24 months, the

child: “acts on doll (i.e., dresses, brushes hair), pretend actions on more than one person, combines two or more actions in pretend, imaginary objects” (Knox, 1997 p. 48). While it appears that at 18 months of age most children should be showing pretend play, the author of the instrument discussed that the play scale “still needs additional standardization, reliability, and validity studies” (Knox, 2008, p. 68).

2.2.7.2 Westby Symbolic Play Scale (Westby, 1980; 1991; 2000). Rather than looking at different dimensions of play, the Westby Symbolic Play Scale (Westby, 1980; 1991; 2000) is used specifically to observe and assess pre-symbolic play; symbolic play; and language. The scale begins measuring pre-symbolic behaviours at 8 months and provides descriptions of expected play behaviours up to five years of age. At 2 years of age (*Symbolic Level 3*) children’s symbolic play is expected to include “elaborated single schemas (represents daily experiences with details)” (Westby, 2000, p. 23). Of note, the examples Westby (2000) provides for this type of symbolic play include “puts lid on pan”; “puts pan on stove” (p. 23); as discussed in Chapter 2, Section 1, it is not fully clear that this type of action actually demonstrates the child displaying any playful orientation.

In discussing the development of the scale, Westby (1980) notes that information on play development was gained from “normal children” (p. 155) observed in day care centres in New York, alongside “severely retarded” (p. 155) children in a special education facility. Further observations were carried out over a year within a childcare centre in New Mexico which led to the ages for normal play development being added to the scale. Specific data on age norms are not provided in the 1980 article but in later work Westby notes that the scale development was:

Based on observations of normal infants, toddlers, and preschool children in childcare centres and handicapped children enrolled in preschool and elementary school special

education programs. Original levels were based on 80% of middle-class pre-schoolers performing the play and language behaviours at each level. (Westby, 1991 p. 133, Westby, 2000, p. 20)

Westby noted that for early-appearing behaviours particularly, middle class-children often show the behaviours earlier than the ages specified in the scale. Therefore, the norms imply most children at 24 months of age should be showing pretend play; however, there may be issues with generalising these age brackets to wider populations because the scale age brackets are based on 80% of *middle-class* children showing a behaviour.

Symbolic play begins on the scale at 17 to 19 months of age (*Symbolic Level 1*). At this age the scale description notes that children should be performing self-pretending activities, such as pretending to drink from a cup or pretending to eat from a spoon. At 19 to 22 months of age (*Symbolic Level 2*) children's symbolic play switches towards dolls and beyond themselves, e.g., pretending to feed a doll and combining pretend actions. Again, it appears that children should be showing pretend play by, or during, the younger age category considered in this review. However, as the age-norms derive from 80% of middle-class children showing the behaviours, there are possible issues with generalisability.

2.2.7.3 The Play in Early Childhood Evaluation System (PIECES; Kelly-Vance & Ryalls, 2008). The Play in Early Childhood Evaluation System (PIECES; Cherney et al., 2003; Kelly-Vance, Gill, Ruane, Cherney, & Ryalls, 1999; Kelly-Vance, Needleman, et al., 1999; Kelly-Vance & Ryalls, 2005; Kelly-Vance et al., 2002; Ryalls et al., 2000, as cited in Kelly-Vance & Ryalls, 2008, p. 551) is an instrument designed for use in observations of children's free play, where children's coded play behaviours are later "compared to norms for typically developing children" (p. 552). The measure was born out of considering whether assessments of children's spontaneous free play behaviours could be used to measure their

cognitive development (Kelly-Vance, Ryalls, & Glover, 2002; Kelly-Vance & Ryalls, 2005). Kelly-Vance and colleagues (2002) highlighted that “no standards existed for what typical children demonstrate during non-facilitated play sessions” (p. 182). The PIECES coding scheme includes exploratory and pretend play as a core domain, with five other types of behaviour included as supplementary parts to the coding scheme. A thirteen-item sequence that comprises the core domain is reported to be developed “from the extensive empirical literature on the development of play (Belsky & Most, 1981; Fenson, 1984, Lyytinen, 1991; Tamis-LeMonda, Bornstein, Cyphers, Toda, & Ogino, 1992)” (Kelly-Vance & Ryalls, 2008, p. 552). As previously discussed in this chapter, the first two studies cited by Kelly-Vance and Ryalls sampled only middle-class children. The other two studies focused on developmental trends (Lyytinen, 1991) and cross-cultural comparisons (Tamis-LeMonda et al., 1992) and therefore means and not proportions of children pretending were reported; hence these studies were not included in the literature review presented earlier in this chapter. Lyytinen (1991) did not report on sociodemographic characteristics and Tamis-LeMonda and colleagues (1992) reported that families were middle to upper class and mostly college educated.

Some early work on the development of the measure (Kelly-Vance et al., 2002) involved the collection of normative data from 16 children (eight children between 24 and 30 months), mostly of middle-class socioeconomic backgrounds. Children were observed for 45 minutes in an unstructured play situation in a playroom. The authors reported on the mean percentages of time the children were engaged in the different play behaviours, at two time points. No standard deviation or range data were reported; thus we cannot determine the percentage of children showing pretend play. The number of children performing pretend play per se was not reported. The authors acknowledged that use of only middle-class socioeconomic groups limited the generalisability of the findings. The authors noted that

practitioners may be expecting children to demonstrate many types of play within a free play session; however, it may be more typical for a limited range of play behaviours to be displayed. Interestingly, it was reported that only one child in the two-year-old age range displayed a substitution pretend action during the observation. In follow-up work examining the reliability of the measure over time, Kelly-Vance and Ryalls (2005) observed 32 children (“typical children” age range = 19 to 46 months) in two free play sessions, using the PIECES coding scheme. It was reported that “most children’s highest level reached the pretend play level” (p. 406) but the percentages of children achieving each level were not reported. Further, children were again from “middle class families” (p. 403) and the age range was too wide to indicate specific information about pretend play at different ages.

2.2.7.4 The Test of Pretend Play (ToPP; Lewis & Boucher, 1997). The use of commercially available tests of pretend play is an alternative way of assessing children’s pretend play. Children are presented with standardised toy sets, and standardised instructions, with the aim of assessing how the child’s pretend plays score fits in with age-normed scores. The Test of Pretend Play (ToPP; Lewis & Boucher, 1997) is designed to be administered as a structured play test, but the coding definitions can also be applied to free play situations (see Chapter 2, section 2.1.6 for more information on this measure). The main aim of the test is to assess whether children between 1 to 6 years of age are:

Substituting one object for another object or person, e.g. using a tissue for a bed cover

Attributing an imagined property to an object or person, e.g. pretending dolly is sick

Reference to an absent object, person or substance, e.g. licking an imaginary ice-cream (ToPP manual; Lewis & Boucher, 1997, p. 1)

A sample of 513 children was tested, and provided normative data, during the development phase of the measure. For the age bracket of 2:0 years (24 months) to 2:5 years (29 months), 45 children were assessed. A maximum raw score of 34 can be achieved,

summed from four different sections, and the raw score is converted into an age equivalent score. The ToPP manual details the means and ranges of scores from different age groups of children, but the proportions of children achieving each score are not reported. As shown in Tables 2.2 and 2.3, all children aged between 24 to 29 months in the normative sample achieved at least a raw score of 2. Thus, all children in this age range appeared to display some ‘symbolic play’; however, a score of two could be interpreted in different ways. For representing an absent object in Section 1 of the test, for example by using a spoon and bowl and pretending to feed themselves with imaginary food, children would achieve 2 points. However, a child would also receive 1 point for copying an instruction; therefore, as the proportions of children achieving each raw score are not reported, it could be that a score of 2 was comprised of two one-point copied responses.

Within the age bracket of 1:6 years (18 months) to 1.11 years (23 months), 44 children provided normative data during the development phase of the measure. As with the 24- to 29-month age bracket, it seems that all children appeared to display some ‘symbolic play’ (see Tables 2.2 and 2.3). However, some of this ‘symbolic play’ may have been copied.

The advantage of the ToPP over most other assessments of pretend play (and studies observing pretend play) is that the authors note “as far as possible, a representative sample was identified in terms of gender, ethnic background and maternal education level” (ToPP manual; Lewis & Boucher, 1997, p. 41). However, the authors additionally note that “the standardisation procedures used in developing ToPP did not include data collection on children’s unstructured free play” (ToPP manual; Lewis & Boucher, 1997, p. 40).

Table 2.2

Mean raw scores and range of scores, reproduced from The Test of Pretend Play (ToPP) manual (Lewis & Boucher, 1997, p. 45; adapted in terms of removal of two columns and removal of non-relevant age groups)

Age group (years)	Number of children	Mean Total Raw Score	Range of scores
1:6–1:8	18	4.83	2–11
1:9–1:11	26	7.81	4–16
2:0–2:2	20	8.20	2–14
2:3–2:5	25	9.52	3–19

Table 2.3

Example of age norms which can be used in free play, reproduced from The Test of Pretend Play (ToPP) manual (Lewis & Boucher, 1997, p. 40; adapted in terms of removal of non-relevant age groups).

Total raw score	Age (Months)
1	16.9
2	19.1
3	21.2
4	23.4
5	25.5
6	27.7
7	29.8

2.2.7.5 Symbolic Play Test (SPT; Lowe & Costello, 1988). An alternative standardised measure of pretend play available for commercial purchase, for the age range of the children considered within this chapter, is the Symbolic Play Test (SPT; Lowe & Costello, 1988). Children between one and three years of age are presented with four sets of toys (including a toy cup; doll; truck) and are assessed on self-related actions (e.g., feeding with toy spoon), doll actions (e.g., feeding doll with toy spoon) and actions such as moving a tractor along, or placing a cup on saucer. The SPT is designed to be administered as a structured task and not as a measure of free play behaviour. While named a test of *symbolic*

play, it is argued that the test alternatively measures so called functional play (Lewis, Boucher, & Astrell, 1992; Power & Radcliff, 2000).

When I reviewed the measure, it appears that some items may be measuring pretend play, e.g., feeding self and feeding the doll. However, such items are not distinguished in the scoring procedure from possible non-pretend items (i.e., items that may be solely afforded by the salient physical properties of the object), e.g., moving a truck. Additionally, the pretend elements of the actions are not clearly defined e.g., sound effects or exaggerations. As with the ToPP, the child achieves a raw score which is then used to calculate an age equivalent score. The normed scores derive from a standardisation sample of 137 children tested from 12 to 36 months of age. Power and Radcliff (2000) discuss that the normative data for the test are inadequate due to the issues of small sample sizes within each age group and that children in upper socioeconomic groups were under-represented, and lower socioeconomic families were over-represented. Other standardised assessments of pretend play, the Child Initiated Pretend Play Assessment (ChIPPA; Stagnitti, 2007); The Affect in Play Scale (APS; Russ, 2004) and The Affect in Play Scale-preschool version (APS-P, Kaugars & Russ, 2009) are used with children three years and above.

2.2.7.6 The Autism Diagnostic Observation Schedule (ADOS) (ADOS-2; Lord, Rutter, DiLavore, Risi, Gotham, & Bishop, 2012). *The ADOS* is a standardised assessment tool used clinically, and in research programs, as part of the diagnostic process to identify children with suspected autism (Luyster et al., 2009). Through a “naturalistic social interaction,” the participants’ communication, social interaction, and play are examined and the scores used in a classification algorithm (Luyster et al., 2009, p. 2). As the empirical investigations of pretend play in the later chapters of this thesis are partly using natural observations of play, it is worth considering what the ADOS tells us about pretend play

between 18 to 23 months of age and whether an adequate normative sample was used in its development.

The ADOS consists of five different modules, the module administered being dependent on the child's chronological and verbal age. The ADOS includes a Toddler Module for children aged between 12 and 30 months. This module was not included with the original ADOS; however, due to promotion of early identification of autism, parents seeking early evaluation, and research highlighting potential markers for autism in the first two years of life, the original ADOS was modified to include the toddler section (Luyster et al., 2009).

The Toddler Module includes a free play session. In this session, standardised toys such as toy telephone; small utensils; small plates; jack-in-a-box; vehicle etc. are provided. Standardised instructions are for the child to play independently for 3 minutes, but the task administrator can then join the play and draw attention to different toys and carry out different activities as part of the ADOS programme. Parents can then be asked to provide encouragement to the child. The observation aims to measure the child's non-verbal communication skills, such as showing and giving toys, and whether the child engages with the toys in a symbolic and functional manner. Later in the Toddler Module a "Bath Time activity", is carried out, with the aim of (but not solely) exploring if the child further engages in pretend or symbolic play. The child is presented with a doll and given a chance to spontaneously engage in pretend play, this is then followed by scripted prompting/suggesting of pretend play. Functional and imaginative play can be scored from either of the activities, or throughout the Module, using the following criteria: (reproduced from ADOS-2 Toddler Module, 2012, but coding levels 1 and 2 missing for description of functional play, p. 19).

For functional play:

0 = Spontaneously plays with a variety of toys in a conventional manner, including appropriate play with several different miniatures/representational toys (e.g., telephone, truck, dishes, materials in the “Bath Time” routine). Do not include imitations, prompted actions, or pushing the car.

3 = No play with toys or only stereotyped play.

For Imagination/Creativity (pretend play) item: “flexible, creative use of objects in a representational manner that goes beyond the physical properties of the materials, (e.g., beyond placing toy spoons on toy plates). Any use of the doll should be coded here, as specified”. (p. 19)

0 = Spontaneous use of a doll or other object as an independent agent (e.g., makes the baby wash its face), OR spontaneous use of objects to represent other objects (e.g., uses a utensil as a phone).

1 = Spontaneous pretend play with a doll (e.g., feeding, hugging, or washing) or other objects, but no use of a doll or other toy as an independent agent or to represent something else.

2 = Imitates pretend play as described above for a rating of 1, OR imitation with a placeholder; no spontaneous pretend play.

3 = No imitated or spontaneous pretend play. (p. 19)

One hundred and eighty-two children between 12 and 30 months of age were assessed as part of the development and validation of the Toddler Module. The sample comprised three groups of children: “typical development” ($n=99$), autism sample ($n= 46$) and “non-spectrum

disorders” ($n=37$); 76 % of the children were male. The proportion of mothers with college education of four or more years was high (75%). Children were seen on average for two assessments (as reported in the manual). Data were reported from two groups noted to be developmentally different, *younger children, older with few to no words (12 - 20 months of age)* and *older with some words (21 to 30 months of age)*. The authors reported mean scores for the *younger age group, or older children with few to no words (12 - 20 months)* for imagination and creativity of 1.91, 1.59 and 1.44 ($SD=0.82$) for children with autism, non-spectrum and typically developing children, respectively. For the *older group with some words (21 months to 30 months)* the mean scores for imagination and creativity were 1.42; 1.00; 0.83 ($SD=0.74$) for children with autism, non-spectrum and typically developing children, respectively. While functional and imaginative play are observed and coded, it should be noted that they are not part of the algorithm for classification of autism. It appears from the mean score and standard deviation reported that the vast majority of children in the *21 months to 30 months* group showed some imaginative play at the 0, or 1 level; however, as noted, the sample studied overrepresented mothers with high levels of education.

2.2.7.7 Summary of findings from pretend play assessment instruments. It appears the vast majority of children showed pretend play between 18 and 30 months of age. However, there were numerous issues identified with the methods used for gathering the age normed data. It was evident that a lack of representative community samples were studied during spontaneous free play activities (with an overrepresentation of middle class, affluent families); this possibly indicates issues with generalising the age-normed data to wider populations (i.e., different socioeconomic groups). Further, some studies reported data across wide age brackets, thus not enabling an exploration of the age of emergence. The need for further work on observed percentages of representative samples of children showing pretend play in free play sessions is again highlighted.

2.2.8 Adult Informants' Reports of Early Pretend Play

As noted, the use of informant reports is considered important for providing information about children's natural pretend play behaviours (Inada et al., 2010) and some authors posit that a more accurate reflection of children's optimal play level is provided, compared to one-time point observations, as several situations are considered (Robins et al., 2001; Honey, 2007). Play behaviours shown during clinical or laboratory observations may be different to those performed in natural home environments (Pierucci, Barber, Gilpin, Crisler, & Klinger, 2015). An advantage of some informant-based pretend play studies over the observational studies reviewed earlier in the chapter is the inclusion of larger, occasionally representative, samples of families and children. Reduced time and cost is often an advantage of questionnaire studies compared to observational research (Roggman, 1991), thus enabling the recruitment of larger numbers of participants.

As part of the Avon Longitudinal Study of Parents and Children (ALSPAC), Roulstone, Loader, Northstone & Beveridge (2002) reported descriptive data from 1127 British children who were part of a Children in Focus (CiF) subsample from the larger study. Children were tested at 25 months of age, thus providing information on the older age range investigated in this review, and participated in direct assessments, although not of pretend play. Parents completed a 3- to 4-minute questionnaire that included one pretend play question: "Does your child play in a pretend way?" (p. 265).

The percentages of parents reporting that their children pretended, on a three-point scale, were as follows: *Often* = 60.7%; *Sometimes* = 36.6%, *Never* = 2.7%. Thus, while approximately 30 children were reported to never have pretended, most children around 25 months of age did engage in at least some pretend play. However, there appear to be individual differences in the amount of pretend play engaged in, possibly due to individual differences in the motivation to engage in pretend play (e.g., Singer, 1973), the availability of

toys or parental attitudes (Fein, 1981). As with much of the observational work I reviewed, mothers who were part of the CiF sample had higher education levels than the overall sample of the ALSPAC study, and presumably the general population. The CiF subsample was intended to be a randomly selected group of 10% of participants from the overall ALSPAC study sample, but the authors acknowledged that because of the educational differences noted, the subsample “did not constitute a non-random group” (p. 262).

In the Twins Early Development Study (TEDS), McEwan and colleagues (2007) studied children of a similar age to Roulstone and colleagues (2002); the TEDS sample was reported to be nationally representative, in terms of maternal education and ethnicity. However, there may be issues with generalisation as all the children were twins. At a mean age of 2 years, 13 days ($SD = 28$ days), 10,412 children took part in an assessment of the origins of individual differences in imitation. Postal questionnaires of the Parent Report of Children's Abilities [PARCA] were distributed to parents and included the following pretend play items, responded to on a yes/no scale:

- i. Does your child ever pretend that one object, such as a block, is another object, such as a car or telephone?
- ii. Does your child ever pretend to do things? For example, riding a horse or making a cup of tea?
- iii. Does your child ever pretend that two dolls are playing together, or are talking to each other, or one is feeding the other?
- iv. Does your child ever play pretend games with another child, pretending to be someone else, such as a parent, firefighter, or nurse?
- v. Plays imaginatively, enjoys "pretend" games, score as certainly true, sometimes true, or not true. (McEwan et al., 2007, p. 492)

The instrument provided a continuous pretend play scale score of between 0.00 - 6.00. The Cronbach alpha value for the scale was .56, therefore below what is considered acceptable by most researchers (see Peterson, 1994). A mean score of 3.36 was reported; thus most children were not said to be engaging in all types of pretending. A standard deviation of 1.47 indicates that the vast majority of children engaged in some pretending around 24 months of age.

While still finding that the vast majority of children were reported by parents to engage in pretend play by parents, lower percentages than those reported in the ALSPAC study (Roulstone et al., 2002) were reported by Frahsek and colleagues (2011) for children within the 24 to 30 months age range. The study methods used by Frahsek and colleagues (2011) were discussed previously in this chapter. In addition to assessing children on a semi-structured pretend play test, the authors also provided parents with a definition of pretend play and parents were required to freely report examples of their child's pretending. Behaviours were later scored as either 1 (pretended with realistic objects, e.g., pretended to eat, feed a doll) or 2 (the parent reported role play or object substitution). In the younger age group (24 months old, range: 23.5 to 24.3 months), parents reported that pretend play was displayed by 78.6% of children at home; 80% of children in the older group (30 months old, range: 29.7 to 30.5 months) were reported to pretend. The authors did not report sociodemographic information.

Turning now to data for children within the 18- to 23-month age range, Inada and colleagues (2010) conducted a general population study of 318 Japanese infants aged 8 to 20 months ($n = 14$ to 37 infants in each cross-sectional age bracket). The aim of the study was to identify "developmental chronology of preverbal social behaviors in infancy" (p. 605), as understanding the chronology of so called "typical" development provides a baseline for understanding social development that is atypical (Inada et al., 2010). While Inada et al. (2010) reported that the sample was a general population sample recruited from rural and urban areas, no other details of social class or sociodemographic characteristics were reported. The researchers used a Japanese version of the Modified Checklist for Toddlers with Autism (M-CHAT; Robins et al., 2001) to measure pretend play. This measure is discussed in more detail later in this chapter; it includes the following question responded to

by parents on a yes/no scale: “Does your child ever pretend, for example, to talk on the phone or take care of dolls, or pretend other things?” (Robins et al., 2001, p. 142)

At 18 months of age, 100 % of the infants in Inada and colleagues’ sample were reported by parents to be displaying pretend play. The percentages of infants reported to be pretending dropped to 94.1%, and 95% at 19 and 20 months of age respectively.

As discussed in Chapter 1, measurement of children’s pretend play is included on screening instruments, as part of “Level 1 routine developmental surveillance” (Weeks, *n.d.*, p. 9), used for early identification of autism. A lack of pretend play, with the absence of other key behaviours, is viewed as a marker for later diagnosis of autism. Studies investigating early markers of an autism diagnosis using such instruments report on parent report data from larger, sometimes nationally representative, samples of children; some of these will be now be considered. The empirical investigations of pretend play in the later chapters of this thesis include informant report data, including an item using the wording of the pretend play item from The Checklist for Autism in Toddlers (CHAT; Baron-Cohen et al., 1992,1996) early screening for autism instrument. Therefore I will briefly discuss the development of the measure.

Development of the CHAT instrument was based around the idea that the developmental achievements of joint attention and pretend play are universal and therefore absence of such behaviours around 18 months of age is indicative of development disorders such as autism (Baron-Cohen et al., 1992). The CHAT consists of two sections: Item A, a 9-item, yes/no response checklist for parents to complete, covering nine areas of development. The areas include motor development; pretend play; and joint attention (and others). Pretend play is assessed via the question: “Does your child ever pretend, for example, to make a cup of tea using a toy cup and teapot, or pretend other things?” (p. 842)

Section B of the CHAT is completed by practitioners following brief structured observations of the children. Pretend play is assessed via the following instructions to practitioners: “Get the child's attention, then give child a miniature toy cup and teapot and say, ‘Can you make a cup of tea?’ Does the child pretend to pour out tea, drink it, etc.?’” (p. 842).

Baron-Cohen and colleagues (1992) reported that normative data were collected from 50 18-month-old children ($M=18.3$ months; range 17 to 20 months) as part of routine health centre check-ups in London and from a second sample of 41 children aged between 17 to 21 months ($M=19.3$ months) who had an older sibling with autism. The children were followed up at 30 months of age, with a letter asking the parent, or GP, to report on any problems the child was experiencing. At the mean age of around 18 months, parents in the first sample reported that 86% of children engaged in pretend play.

An issue with the first normative study was the size of the sample studied; therefore, the CHAT was later tested in a larger prospective population screening study of 16,000 children (Baron-Cohen et al., 1996). A strength of the new investigation was that in terms of main caregiver's social class, the sample was reported to be broadly nationally representative. In the article, where pretend play was defined as an activity involving substitution of objects or attributing absent properties to situations or objects in play, the universality and cross-cultural nature of pretend play was again discussed, and reference was made to the earliest pretend play emergence being around 14 months old. Children were screened by GPs or health visitors in the South East of England at a mean age of 18.7 months ($SD = 1.1$ month). A “normal group” was created, with children who passed the key CHAT items of *protodeclarative pointing* (PDP), *gaze-monitoring* (GM) and *pretend play* (PP). The authors estimated that 99.6% of children met this criterion; however, data on pretend play were not specifically reported and the authors note that the percentage of children meeting the criteria

was an estimate based on the retesting of approximately 20 children only. A further follow-up study of the children at age seven (Baird et al., 2000) found that failing both the pretend play and joint attention items at 18 months was a risk factor for later autism and related developmental disorders. However, the CHAT has been noted to have low sensitivity as it fails to identify some children with autism (Baird et al., 2000; Barbaro & Dissanayake, 2009).

Data using the CHAT measure were recently reported by Huang and colleagues (2014); (NB. These researchers used all nine items from section 1 of the CHAT and four items from section 2, but they also added more questions to both sections). Eight thousand children aged 18 to 36 months of age were investigated as part of an early screening programme in community hospitals in China. Children who failed two items on the CHAT parent questionnaire section, or observation items section, (including pretend play; responding to name; producing a point), were followed up a year and a half later. At follow-up, 22 children had received a diagnosis of autism. Pretend play was found to discriminate children followed up and later diagnosed with autism from children not followed up. At the 18- to 36-month-old assessment, 93.6 % of children not followed up were reported to engage in pretend play by informants. However, the age range of children seen was wide (18 to 36 months) and the distribution of behaviours at different ages was not reported. Furthermore, the sample was drawn from a middle socio-economic area; the authors acknowledged that urban children were overrepresented.

The sensitivity issues with the CHAT for identifying autism led to a modified version being developed, termed the Modified Checklist for Autism in Toddlers (M-CHAT; Robins et al. 2001), for use with children 16 to 30 months of age. The nine parent-report items from the original CHAT were retained, with the inclusion of an additional 21 items; all items were responded to using a yes/no scale. The measure was designed to be completed solely by parents, as part of the American healthcare screening system (Kleinman et al., 2008). Robins

and colleagues (2001) argued that one observation of behaviour in a GP surgery may not be a reliable indicator of children's typical behaviour (as was part of the original CHAT measure); therefore, it is essential for screening instruments to include parent report measures. The pretend question appears reworded from the CHAT: "Does your child ever pretend, for example, to talk on the phone or take care of dolls, or pretend other things?" (p. 142).

Two samples of children were investigated during the development of the measure. The first sample comprised 1122 children aged between 18 to 25 months who were seen during "well-baby" check-ups in the United States, and a second sample of children whom were referred to early intervention services. Socioeconomic characteristics, or mother's age, were not reported. Follow-up assessments took place if children failed three or more of any M-CHAT items, or two critical items. Of the children assessed, 1,161 did not require a follow up and of those 0.9% (approximately $n = 10$ children) had failed the pretend play item. For the 74 children who required a follow-up phone call but were found to not have language delay, global delay or autism, 20 % ($n = 15$) had failed the pretend play item. For children diagnosed with global or language delay, but not autism, 31.6% ($n = 19$) had failed the pretend item, and, of those evaluated for autism, 51.3% ($n = 39$) failed the item. The percentage of children overall failing the pretend item on the M-CHAT was small; however, the age range of the children in the study spanned seven months from 18 to 25 months, and the age split of children who passed or failed the items was not reported. The authors report that the first 600 participants were seen at 18 months of age and then the remaining at 24 months old. It would be interesting to know if there were differences in pretend play pass rates between the different age ranges.

Large scale studies investigating the use of translated versions of M-CHAT in countries beyond the US and the UK have shown similarly low numbers of children failing the pretend play item, at 24 but also 18 months of age. Table 4 reports a sample of studies, although an

extensive review was not conducted. The lowest reported percentage of children failing the pretend play item (without DD or autism) was the sample of 24-month-old French children studied by Baduel and colleagues (2017); however, for studies with children aged 18 months, or between 16 to 30 months of age, the percentage of children failing the pretend play item was also low, most commonly between 1-2% (See Table 2.4). Some studies, e.g., Nygren and colleagues (2012) only report the failure rates of the pretend play item for children with autism.

Table 2.4

Large scale studies investigating the use of translated versions of the Modified Checklist for Autism in Toddlers (M-CHAT) for early screening of autism

Author(s) and title	Sample Information	M-CHAT Translated Version	Age of Children	Percentage of Children Failing M-CHAT Pretend Play Item (without DD or Autism)	Additional Results/ Percentages of Other Children Failing the Pretend Play item
Baduel et al. (2017) <i>“The French Version of the Modified-Checklist for Autism in Toddlers (M-CHAT): A Validation Study on a French Sample of 24-Month-Old Children”</i>	<ul style="list-style-type: none"> 1,250 children “Non” autism: $n = 1209$ 	French version	24-month-old children	“Non” autism: 0.25 %	Developmental Delay: 5.88% Autism: 55.56 %
Canal-Bedia et al. (2010) <i>“Modified Checklist for Autism in Toddlers: Cross-Cultural Adaptation and Validation in Spain”</i>	<ul style="list-style-type: none"> 2,480 children Grouped following assessment: <ul style="list-style-type: none"> No follow-up: $n=2,032$ OK on follow-up interview: $n = 362$ Evaluated NON-autism: $n = 63$ Evaluated autism: $n = 23$ 	Spanish version	Between 16 and 30 months 1) 18 -month routine vaccinations ($n=1482$), 2) 24 -month well-baby check-ups ($n=935$) 3) Sample of high-risk children ($n=63$)	No followed up: 1.13% Followed up and not diagnosed with a developmental disorder: 1.10%	Developmental disorder: 29% Autism: 48%

Fujiwara (2013) <i>“Socioeconomic Status and the Risk of Suspected Autism Spectrum Disorders”</i>	<ul style="list-style-type: none"> • 6,061 children • Percentage of Mothers with high school education or less: 25.9 % • 90 % of the Japanese population participate in 18-month check-ups • 	Japanese version	18-month health checks	The pretend play item was reported to be failed by 1.7 % of children ($n=104$).	No significant differences were found with maternal or paternal education, or income, and M-CHAT pass rates.
Stenberg et al. (2014) <i>“Identifying Children with Autism Spectrum Disorder at 18 Months in a General Population Sample”</i>	<ul style="list-style-type: none"> • 52,026 children • Norwegian Mother and Child Cohort Study (MoBa), a prospective longitudinal population-based study • M-CHAT completed by 73% of participants from the original study 	Norwegian version	18-months-old	“Non”- autism: 1.9% failed the pretend play item	Autism: 16.2%
Wong et al. (2004) <i>“A Modified Screening Tool for Autism (Checklist for Autism in Toddlers [CHAT-23]) for Chinese Children”</i>	<ul style="list-style-type: none"> • Cross sectional cohort study with 212 children • Without autism or developmental delay: $n=58$ 	CHAT-23 A checklist translated into Chinese that combines the M-CHAT items with the CHAT	Children without autism or DD: $M = 23.9$ months ($SD=3.9$) (range: 16 to 33 months)	Children without autism: 12% failed the pretend play informant reported M-CHAT checklist item	16.8% failed the CHAT pretend play observational item (i.e., observation of pretend play by trained assessor).

- With developmental delay: $n=67$ observational section Children with DD:
 $M= 33.51$ months
(range: 16 to 52 months)

As shown in Table 2.4, not all studies using the questions from the M-CHAT show percentages of children failing the pretend play item to be around 1-2%, e.g., Wong et al. (2004). It is of note that the percentages reported by Wong et al. (2004) are similar to those reported by Baron-Cohen et al. (1992) in development of the original CHAT measure. However, the age range studied by Wong et al. (2004) was wide and a breakdown by age was not provided.

Nonetheless, all studies using the M-CHAT items (and all studies reporting data from the original parent-reported sections of the CHAT) report above 85% of children (without DD or autism) within the 24 to 30 months and 18 to 23 months age brackets to show pretend play by informants. However, there may be misreporting from parents. Furthermore, some of the studies had wide age brackets, included children from 16 to 36 months of age and breakdown by age was not reported; it would be interesting to know if the rates of children failing the pretend play item were similar at the different ages.

Reviewing the wording of the item on the revised M-CHAT question, part of the question includes the statement “take care of dolls”. This definition is absent from an original version of the measure (the CHAT). The percentage of children reported to be pretending may be inflated by this inclusion. Possibly there is no pretend element to the child’s actions when a parent observes a child “taking care of a doll”; alternatively, the child may simply be placing a doll in a cot without pretending to take care of it, or without pretending it is a baby? It seems that the original CHAT item may provide a more stringent measure of pretend play. It would be useful to know if the children reported to pretend by informants using the M-CHAT item would additionally show pretend play during observations.

To improve the sensitivity of identifying children with autism using general population screening instruments, Alison and colleagues (2008) argued that “it is likely that a

complete absence of the relevant behaviour is too stringent in determining whether a child may be at risk for [autism]” (p. 1416) and suggested that identifying a reduction in the frequency of pretending, and other behaviours, may be useful for identifying milder autism cases. This led to the development of the *Quantitative Checklist for Autism in Toddlers* (Q-CHAT; Alison et al., 2008), a 25-item caregiver report scale for use with children 18 to 24 months of age. A mixture of items from the CHAT and M-CHAT is included with a new Likert style response scale for informants to report on the frequency of behaviours. The wording of the pretend play item and response categories are as follows: “Does your child pretend (e.g., care for dolls, talk on a toy phone)?” (0) “many times a day” (1) “a few times a day” (2) “a few times a week” (3) “less than once a week” (4) “never” (p. 1423); the wording of the question is like the M-CHAT item, with the addition of the frequency scale. The authors presented preliminary data using the measure, including findings from an unselected group of 754 parents with toddlers aged between 17 to 26 months ($M = 21.2$ months) from Cambridgeshire, UK. 1.3% of parents reported that their children never pretended, while 89.5% of children were reported to engage in pretend play many or few times a day. It is important to note that the authors reported that the sample was not representative of the UK population, with managerial and professional occupations overrepresented (for men and women).

A previous review (Magiati et al., 2015) noted that five studies in the UK had used the Q-CHAT measure and the review followed with a study exploring the reliability and validity of the measure in a sample of toddlers in Singapore. The participants were taking part in a prospective longitudinal birth cohort study, with the sample who provided Q-CHAT data found to be reasonably representative of the original cohort study sample. The study reports data for both 18- ($n = 368$), and 24-month-old children ($n = 396$) separately, advancing on other studies using such measures. At 18 months, 76.4% of children were reported to pretend

play many or few times a day, with lower percentages, 59.9%, at 24 months. At 18 months, 3% of children were reported to never engage in pretend play and 7% were reported to never pretend at 24 months. Therefore, the percentages of children reported to never pretend was higher than the UK study reported by Alison and colleagues (2008), which is possibly explained by cultural differences. Again, while there are individual differences reported, as with the M-CHAT and CHAT studies the percentages of children showing pretend play within the 24 to 30 and 18 to 23 months age brackets are consistently above 80%.

The M-CHAT was further revised as the Modified Checklist for Autism in Toddlers, Revised, with Follow-Up (Robins, Fein & Barton, 2009), with validation data reported by Robins et al. (2014). However, pretend play data were not specifically reported. Interestingly, the pretend play item was modified again; the item is now ‘Item 3’, with the wording now as follows: “Does your child play pretend or make-believe? (FOR EXAMPLE, pretend to drink from an empty cup, pretend to talk on a phone, or pretend to feed a doll or stuffed animal?)” (Robins et al., 2009, p. 3); thus the “taking care of a doll” statement from the original M-CHAT has now been removed.

There is still a need for more informant-reported data from nationally representative studies of children from the UK and elsewhere, and a need to examine the level of agreement between observational data and informants’ reports (i.e., in mixed-method research designs).

2.2.9 The Importance of Mixed-Method Study Designs for Investigating the Emergence of Pretend Play

While the benefits of informant report studies have been outlined, parents may misinterpret or misreport items, forget behaviours, report on behaviours not considered to be pretend play by researchers, or fail to report on play behaviours due to confusion over questionnaire wording (Fenson et al., 1994; Honey, 2007; Inada et al., 2010). Therefore, a mixed methods approach

that includes observation of children's pretend play, collection of informant report data and an assessment of the agreement across the different measures is important for the investigation of early pretend play. The importance of using multiple methods across a variety of settings, and informants, to allow children to show optimal play competence has been previously recommended for autism assessments (e.g., Pierucci et al., 2015). Exploring correlations between children's performance on observed pretend play assessments with parent reports is one way of assessing the validity of researcher's observations (Frahsek et al., 2011).

2.2.9.1 What do studies using mixed method designs tell us about pretend play between 18 to 30 months of age? It appears that previous studies using a mixture of methods (e.g., informant report and researcher observations) to measure pretend play between 18 and 30 months of age have mostly measured pretend play as a component of composite variables (e.g., Wetherby, Allen, Cleary, Kublin, & Goldstein, 2002). In cases where pretend play has been studied independently using one methodology, the variable it has been correlated with is often a composite variable, i.e., not solely pretend play (e.g., Pierce, 2009), or the second measure assesses different variables, e.g., parent attitudes (e.g., McInnes & Elpidoforou, 2018). Therefore, it is difficult to determine what such studies show specifically about pretend play rates between 18 to 30 months of age. Furthermore, the percentage of children showing pretend play is often not considered; rather, the mean scores across clusters are reported (e.g., Unhjem, Eklund, & Nergard-Nilssen, 2014). This is most likely because investigating the emergence of pretend play was not the focus of many of the studies I identified. Where studies have investigated agreement across informant reports and observations of pretend play, and analysed specifically pretend play using both methods, it appears that measurement has not been undertaken during observations of spontaneous free play sessions.

The Checklist for Autism in Toddlers (CHAT; Baron-Cohen et al., 1992, 1996) discussed earlier in this chapter, includes a 9-item, yes/no response checklist for parents to complete (Section A); Section B is then completed by practitioners following brief structured observations of the children. Baron-Cohen and colleagues (1992) did not detail agreement statistics but reported that GPs or health visitors observed 82% of 18-month-old children to pass the item; a similar rate of children had been reported to pretend play by parents (86%). Baron-Cohen and colleagues (1992) noted that differences (lower observed percentages) were accounted for by children's shyness or lack of native language during the observation session. It appears that receptive language ability would be involved in passing the Section B items. Similarly, in the Huang and colleagues (2014) study discussed previously, which also used the CHAT instrument, the data gathered were also similar from the observed and parent-reported sections, with 93.8% of children aged 18 to 36 months (not followed up) observed to pretend and 93.6% of children reported to pretend by parents.

In the Frahsek and colleagues (2011) study discussed previously, the observed rates of pretend play were lower than those reported by parents for the 24-month-old children. It may be that measurement of pretend play in the laboratory, or by observation, can underestimate a child's capacity for pretend play. However, for the 30-month-old children, while 93% of children pretended to give the doll a drink during the structured task, only 80% of parents reported that children engaged in pretend play at home. Nonetheless, the child's total score (combined for both ages) on the laboratory assessment was moderately correlated with the parents' reports of children's pretend play, with specific associations between parent-reported pretend play, child-assessed pretend drinking (self-directed pretence) and child-assessed self-initiated/elaborated pretend play. This is one of the few studies I located to report agreement statistics between parent reports and observed pretend play within the 18- to 30-month age bracket.

There appears to be a paucity of research exploring the agreement between informant-reported pretend play and observations of pretend play in spontaneous free play settings. The parent report studies considered in this chapter seem consistently to report the percentage of children above 18 months of age who show pretend play to be around 80% or more, whereas some observational studies of free play report lower percentages. Observed and assessed pretend play may have more of a performance element (in addition to competence element) engrained in it (Vondra & Belsky, 1991). As noted, some children may have more of a propensity to want to engage in pretend play during observations (Singer, 1973). This has implications for the use of observations of pretend play in developmental assessments. This review has highlighted the need to explore associations between observations of spontaneous pretend play and informant reports in larger, more representative community samples of children.

2.2.10 Discussion

It emerged from the review that observational studies of the percentages of children who show pretend play in free play situations have often been carried out with small samples of children, often from middle class families, not representative of wider populations. This extends to the observational data used in the development of assessment instruments that assess developmental delays and disorders such as autism, where representative samples have not been observed during free play sessions. Thus, there appear to be some issues with generalising from existing findings.

With respect to the question of whether most children between 18 to 30 months, and specifically in the age ranges 24 to 30 months and 18 to 23 months of age, show pretend play, there is some disparity in findings dependent on the data collection method used. In observations of free play, we see that, for children aged between 24 to 30 months nearly 80 % of studies reported that the vast majority of children showed pretend play; however, for

children between 18 to 23 months of age, only 65% of studies reported that pretend play was shown by the vast majority of children (see Table 2.1 for study references). It has previously been suggested that observations of free play situations may provide a measure of children's pretend play performance, not their competence (Vondra & Belsky, 1991); however, in tasks where children are requested to pretend, or verbal script accompanies measurement of free play pretend play, we may see more of child's play competence (Vondra & Belsky, 1991). However, the review found that individual differences were still reported for children within the 18 to 23 months age bracket when data were gathered using more instructional tasks, with not all studies reviewed in this chapter showing that the majority of children showed pretend play following instructions or requests. It was not until children were 26 to 30 months old that we saw most children (80% or above) demonstrating pretend play in the laboratory studies reviewed. However, the review of such studies was not exhaustive or analysed quantitatively.

For data gathered from informant reports, which may provide a better measure of the child's pretend play competence, as a wide range of situations are seen (Robins et al., 2001; Honey, 2007), we see that across the full 18 to 30 months age range, the vast majority of children (i.e., 80% or above) are reported to pretend play. It did not seem that there were differences depending on whether children were in the 24- to 30- or 18- to 23month age brackets, although this was not tested statistically, and the review was not exhaustive.

Westby (1980) used the criteria of 80% of children showing a behaviour in development of the Symbolic Play Scale and this was adopted in the current chapter to provide a quantitative measure of whether the vast majority of children show pretend play. However, it should be considered that 80% of children is not equivalent to all children. Within the 18 to 23 age bracket (and at 24 months of age for data gathered from informant reports), a small number of studies reported 79 to 86% of children showed pretend play.

Similarly, in the observational studies of free play sessions with children aged 18 to 23/24 months, there were studies that reported similar percentages of around the 80-85% of children showed pretend play (e.g., Ungerer et al., 1979; Fenson, 1978; le Normand, 1986). Therefore, while such studies were classified as showing the vast majority of children showing pretend play, around a fifth of children did not show pretend play. This is a limitation of using arbitrary cut-off points; however, it is important to reiterate that the percentage cut-off point used to represent the ‘vast majority’ in the current investigation was based on how previous authors have conceptualised this term (see p. 52).

2.2.10.1 Aims for the Thesis. The individual differences found within this review warrant further investigation. While assessments of pretend play are part of developmental screening assessments during the 18- to 23-month age period, it appears there may be normal variation, with some children simply not showing pretend play until after 24 months of age. The findings from this literature review support researchers who note the age of emergence to be 18 to 24 months of age (e.g., Cabrera et al., 2017; Wilson et al., 2017), and are in line with researchers who recommend screening of pretend play in relation to autism from 24 months of age, but not prior to this point (e.g., Barbaro & Dissanayake, 2012).

Due to the inclusion of pretend play on a variety of assessment instruments for developmental delays and disorders there is need for continued study on its age of emergence and how the data on this topic compares statistically when different methods of data gathering are used with the same samples of children. As noted, there was a dearth of research conducted using a variety of methods to investigate pretend play within the same samples of children and only limited observational research undertaken in representative community samples; this thesis aims to address both gaps in the literature.

To extend our understanding of the age that pretend play generally emerges, there is a need for further exploration of the rates of engagement in pretend play at different time points across the first three years of life in representative community samples of children. To meet this need, the thesis first aims to investigate the rates of engagement in pretend play in a community sample of children from the UK studied between 17 and 24 months of age (Study 1). The findings from the current literature review, in particular the finding that some earlier studies that observed more representative samples of children reported fewer than 80 % of children showing pretend play in the toddler period, suggest that individual differences in the emergence of pretend play (i.e., that pretend play will not yet have emerged for some children) will be evident at this time point in this empirical study of a representative community sample of children. Second, to investigate whether there is a move towards an almost universal emergence of pretend play past 24 months of age, as was suggested by the current review of the literature, the thesis then aims to empirically explore the rates of engagement in pretend play in the same group of children into the third year of life (Study 2). The overarching aim being to investigate when pretend play emerges for the vast majority of children in general populations. It is expected that during the third year, in a representative community sample of children, that the vast majority of children will now engage in pretend play.

As both clinical and educational assessments for developmental delays and disorders rely differently on observations of play in the home or laboratory, or on data provided by informants, it is important to understand if the data from different methods of data gathering show similar proportions of children displaying pretend play, and if there is statistically significant agreement across different measures. Therefore, the thesis aims to examine rates of engagement in pretend play gathered empirically using different methods of data collection (direct observation and informant report). The thesis aims to explore the agreement between

reported rates of pretend play from different informants and rates of pretend play observed during an unstructured free play session in the child's home and rates of pretend play observed during free play sessions in the laboratory. The goal being to examine if short, single, observations of free play in the home, or the laboratory, are useful for identifying children's capacity for pretend play. The current review of earlier findings indicated that the use of different methods of data collection may lead to different findings on the proportion of children who can show pretend play in toddlerhood and early childhood; however, as there has been dearth of mixed-method design studies (e.g., combining findings from observational methods with informant report methods) predictions from earlier studies are limited; any differences in findings from different methods across studies may be due to differences in the samples of children studied, rather than the data collection methods used.

Chapter 3

General Method of the Cardiff Child Development Study

Within this chapter I will outline the overall methodology of the Cardiff Child Development Study (CCDS); the source of data for all subsequent empirical investigations. I will outline the design of the CCDS study, the participants, the demographic characteristics of the sample and the procedures used at each stage of data collection, with a specific focus on the procedures and measures used for the investigations within the current thesis. Further methodological information specific to each empirical investigation will be provided in Chapters 4 and 5.

3.1 Design

The Cardiff Child Development Study is a prospective longitudinal study of a nationally representative sample of first-time mothers and their children. The study used a mixed method design. Parents were first interviewed during pregnancy (Wave 1) and the families were then followed up at five additional time points (Wave 2 - 6) when the children were at a mean age of 6, 12, 21, 33 and 84 months. The study was funded by the Medical Research Council (MRC) grants G0400086 and MR/J013366/1 and ethical approval for the procedures used in the study was granted by the National Health Service (NHS) Multi-Centre Research Ethics Committee and the Cardiff University School of Psychology Research Ethics Committee.

3.2 Participants

3.2.1 Recruitment

Three hundred and thirty-two primiparous women and, when possible, their partners were recruited between 1st November 2005 and 31st July 2007 from National Health Service

(NHS) antenatal clinics and general practice clinics in the Cardiff and Vale University Health Board and the Gwent Healthcare Trust, UK. The areas that the antenatal clinics served were selected to provide a diverse sample of families. To increase the representativeness of the sample, midwifery teams also granted access to antenatal clinics for specialist medical problems and to outreach services for vulnerably housed individuals.

With the help of clinic receptionists, trained researchers approached primiparous women in the hospitals or clinics. The researchers gave a brief explanation of the study and explained to the families what their enrolment in the study would entail. When families expressed an interest in participating, they were provided with a leaflet, invited to watch a recruitment DVD and asked to provide their contact details. The CCDS project administrator contacted the families within two weeks of the first contact to provide additional study information. For families willing to take part in the study, an appointment was made for the third trimester of the pregnancy (Wave 1). No exclusion criteria were used for the study except miscarriage or infant death. Translators were employed for participants who had impaired hearing and for families whose native language was not Welsh or English.

3.2.2 Demographic Characteristics

The sample is nationally representative; the demographic characteristics did not differ significantly from the nationally representative sample of first-time mothers in the UK Millennium Cohort Study (K. Kiernan, personal communication, April 2009), the most recent U.K. national cohort study. The families provided demographic information during Waves 1 and 2 of the study, via interview or questionnaire. The sample characteristics are presented in Table 3.1.

Table 3.1

Demographic characteristics for the participants of the Cardiff Child Development Study (CCDS)

Demographic characteristic	Full sample of the CCDS (N=332)
Mother's mean age at birth	28.15 (SD 6.35, range 16.09 - 42.99)
Father's mean age at birth	30.68 (SD 6.82, range 15.62 - 56.67)
Social Class (%):	
Middle class	50.90%
Working class	49.10%
Mother's Highest Educational Achievement (%):	
No qualifications	5.10%
Fewer than 5 GCSEs A* - C	16.60%
More than 5 GCSEs A* - C	13.90%
A-levels	11.70%
Undergraduate degree	28.00%
Postgraduate degree	24.70%
Mother's Relationship Status at Birth of Child (%):	
Married	50.3%
Cohabiting	33.7%
In relationship with father, not living together	6.3%
Single	9.6%
Mother's Ethnicity (%):	
British	92.7%
Other European	3.5%
Bangladeshi, Indian, Pakistani	1.6%
South East Asian	0.3%
Mixed race	0.6%
Other	1.3%
Child Gender (%)	
Male	56.7%
Female	43.3%
Mean Sociodemographic Adversity	.00 (SD .99, range -.95 - 2.51)

The family's social class was categorised according to the Standard Occupational Classification 2000 (SOC2000; Elias, McKnight, & Kinshett, 1999), with classification later dichotomised as either working class, or middle class. Information on the mother's educational achievements was also dichotomised to indicate if basic education qualifications had been achieved (or not); i.e., whether the mother had achieved five or more General Certificate of Second Education (GCSE's) at grades A* to C or equivalent. Further demographic information collected included the mother's age at their first birth, the mother's ethnicity, whether the mother was in a stable relationship with a partner, and their marital status.

A variable indicating the child's exposure to sociodemographic adversity was created using polychoric Principal Component Analysis (PCA) with the maternal variables noted above: (1) no educational qualifications or fewer than five GCSE's or equivalent attainments; (2) being aged 19 years or younger at the time of child's birth; (3) not being legally married during the pregnancy; (4) not being in a stable couple relationship during the pregnancy; and (5) occupation being classified as working class according to the Standard Occupational Classification 2000 (SOC2000; Elias et al., 1999; see Perra, Phillips, Fyfield, Waters, & Hay, 2015, p. 1233). These items contributed to a single component that explained approximately 77% of the shared variance; the factor scores provided a composite measure of sociodemographic adversity. A positive score indicates higher than average exposure to risk factors contributing to sociodemographic adversity.

3.3 Procedure

The CCDS consisted of six waves of data collection, beginning with Wave 1 conducted in the home. The subsequent waves of data collection followed a pattern of alternating home visits and laboratory visits (See Figure 3.1). Data collection at each time point included a

combination of observational methods, interviews and questionnaires. The current thesis uses data derived from Waves 1, 3, 4, 5 and 6 of the CCDS study.

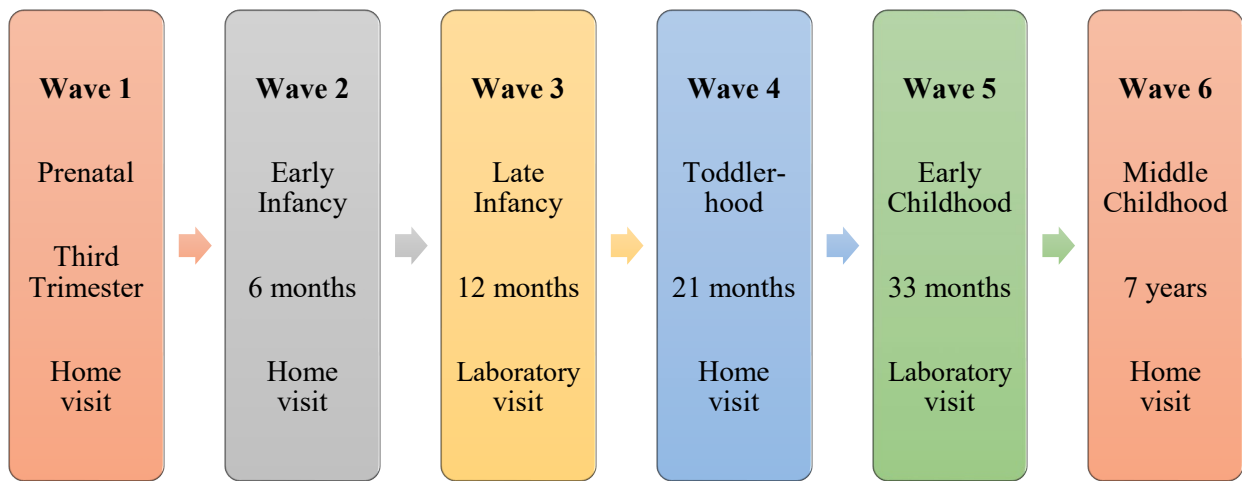


Figure 3.1. Overview of Cardiff Child Development Study (CCDS) procedure (wave; assessment; mean age; location of visit)

3.3.1 Wave 1: Prenatal Assessment

During the third trimester, the families were visited at home by two research assistants. The Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990), a semi-structured interview schedule for measuring and classifying the symptoms of major psychiatric disorders, was conducted with the expectant mothers and fathers. Where possible, the mothers and fathers were interviewed in separate rooms. The interviewers also gathered socio-demographic information, and information on educational attainment, employment, social support, conflict in the workplace, family history of mental health, and antisocial behaviour. The interviews lasted for two hours on average. After the interviews were completed, research assistants provided the parents with questionnaires. The questionnaires asked about the parents' general health, lifestyle, life events, relationship quality, personality traits, substance use and the pregnancy. Parents were asked to post the questionnaires to the

university when convenient. Upon completion of the visit, families received a £20 gift voucher as remuneration for their time.

3.3.2 Wave 2: The Early Infancy Assessment

At a target age of 6 months ($M = 6.55$, $SD = 0.88$), families were visited at home. During the visit, which lasted approximately two hours, the SCAN interview was conducted again with the mothers, assessing the mothers' mental health since the Wave 1 visit. The interviewers who conducted the SCAN also asked the mothers about their experience of labour, any changes in their relationship, living environment or education, and their current level of social support. Additionally at this wave, the infant was filmed taking part in a 25-minute battery of social, emotional, and cognitive tasks. The assessment also included several parent and child interaction activities. Questionnaires, which included questions on the informant's general health, lifestyle, life events, relationships, family structure, and the infant's behaviour, were provided to the mother and father. A third questionnaire, which only included questions on the infant's behaviour, was to be completed by a third informant (e.g., a family member or family friend). Upon completion of the visit, families received a £20 gift voucher as remuneration for their time.

3.3.3 Wave 3: The Late Infancy Assessment

When infants approached 12 months of age, the families were invited to take part in a simulated birthday party at the School of Psychology laboratory. Where possible, three families were scheduled to attend each session. At a mean of 12.84 months (10.52 to 16.84 months; $SD = 1.16$), families attended the testing session for approximately one and a half hours. The session began with individual assessments in separate rooms. In the presence of caregivers, infants were assessed for approximately 25 minutes on a battery of social, emotional, and cognitive tasks. Caregivers also completed questionnaires about the infant's

behaviour during this time. The families were then escorted to a laboratory room decorated to resemble a living room and all families were observed together during a simulated birthday party. The party began with a ‘Teddy Bears Picnic’ scenario, involving a researcher dressed as the ‘Birthday Lady’ and a second researcher dressed as the ‘Teddy Bear’. During the scenario, the birthday lady emptied a picnic basket containing a plastic tea set, plastic plates, and play food items onto a picnic mat (see Hay et al., 2016 for further procedural details). A 20-minute free play session followed, where the families were left alone in the party room and instructed to behave as they normally would at a children’s party; see section 5.2.2 for a description of the toys available during this free play session. Infants’ pretend play was coded from the video records of this free play session. Following the free play session, infants select a gift-wrapped book from a lucky dip and families received a £20 gift voucher as remuneration for their time.

3.3.4 Wave 4: Toddler Assessment

Within a target age range of 18 to 24 months ($M = 20.60$, $SD = 2.26$), two research assistants visited the family home for approximately two hours (some children were seen outside of the target age range; child age ranged from 17.00 to 29.60 months). The home visit began with a brief interview, which asked the caregiver about any subsequent pregnancies, new education attainments and new employment information. Two parent-child interaction tasks were then completed and filmed. The last part of the visit involved a free play session with the focal child and a familiar child. A friend of the parents, with a child of a similar age to the focal participant, was invited by the family to participate. The session was scheduled to last for 45 minutes; the focal child’s pretend play was coded from video records of the first 20-minutes of this free play session. The researchers provided a standard set of toys; however, the children were free to move around the home and garden naturally and play with their own toys, furniture, objects and technology equipment. A researcher followed the focal child with

a video camera, interacting only if asked a question. Parents were encouraged to act as they naturally would. As part of the Wave 4 battery of assessments, paper questionnaires (and free post envelopes), were provided to up to three informants; the mother, father and third informant (other family member or family friend). Families received a £20 gift voucher at the end of the visit to remunerate for their time.

3.3.5 Wave 5: Early Childhood Assessment

The families were once again invited to participate in a simulated birthday party in the laboratory when the children were within the target age range of 25 to 36 months ($M = 33.60$, $SD = 2.48$, some children were outside of the target age range; child age ranged from 27.61 to 41.20 months). The procedure was a replication of the Wave 3 assessment, except the experimental tasks and some toys were changed to be appropriate to the children's age (see section 5.2.2 for a description of the available toys). The assessment, as with Wave 3, began with individual assessments in separate rooms. Children were assessed on a battery of age-appropriate social and cognitive tasks, and two parent-child interaction tasks were completed. A simulated birthday party again followed, with the procedure fully replicated from the Wave 3 assessment. Children's pretend play was again coded from the video records of the 20-minute free play sessions. Following the free play session, children select a gift-wrapped book from a lucky dip and families received a £20 gift voucher as remuneration for their time. Prior to the laboratory visit, mothers, fathers and a third informant (other family member or family friend) were provided with a questionnaire battery. The questionnaires were collected during the visit, or the families were provided with stamped addressed envelopes to return the questionnaires at a later point.

3.3.6 Wave 6: Middle Childhood Home Visit

The families were visited in the home again when the child was at a target age of seven years old ($M=6.96$). Two, or three, research assistants visited the home on two separate occasions, with each visit lasting approximately two hours. During visit 1, a trained research assistant interviewed the primary caregiver (90.40% mothers) using the Preschool Age Psychiatric Assessment (PAPA; Egger & Angold, 2004). The interview contained a question about whether the family had sought advice from specialists about any developmental problems the child might be experiencing. At visit 2, the SCAN interview used in the earlier waves was administered to the primary caregiver, and the interviewer additionally gathered information on the caregiver's social support, and the family lifestyle arrangements.

While the interviews took place with the caregiver, the focal child completed a battery of emotional, cognitive, and social assessments with a second research assistant. If possible, the child and caregiver assessments took place in separate rooms in the home. If younger siblings were present, a third researcher additionally attended the visit. The researcher brought a bag of toys, books, and art equipment to keep the sibling occupied and thus prevent interruption of the focal child's assessments or the caregiver interviews. Following the separate assessments, the caregivers, child, and siblings if present, took part in several family interaction games. The interviewer additionally provided the family with a questionnaire battery, with questions regarding their child's behaviour, their own health, life events, lifestyle, relationships and family structure, to be completed by the mother and, when possible, father. Caregivers additionally provided details of the child's teacher, the teachers were contacted and completed questionnaires on the child's behaviour in school. Upon completion of each visit, families received a £20 gift voucher as remuneration for their time and the child received a £10 book voucher.

Chapter 4

Study 1

Displays of Pretend Play in a Community Sample of Toddlers Aged between 17 and 24 Months: Do the Vast Majority of Children Engage in Pretend Play?

4.1 Introduction

As I discussed in Chapter 1 and Chapter 2, it is noted by some authors that children's first displays of pretend play appear 'normally' in general populations by the middle of the second year (e.g., Baron-Cohen et al., 1992; Baron-Cohen et al., 1996; Rutherford et al., 2007).

Based on this understanding, children's ability to display pretend play is measured as part of some developmental assessments for delays and disorders from 16 months of age (e.g., as part of the M-CHAT, Robins et al., 2001). However, the evidence from the review of the literature I presented in Chapter 2 suggests there may actually be normal variation in the timing of the first displays of pretend play up to the end of the second year of life, and possibly into the beginning of the third year. This has important implications for the inclusion of pretend play measures on assessment instruments for developmental delays and disorders, as well as educational assessments, before this time point (see Chapter 1 and Chapter 2).

The individual differences in the emergence of pretend play towards the end of the second year identified in Chapter 2 require further investigation; there is a need for further exploration of the rates of engagement in pretend play during the second year of life in community samples of children. The majority of earlier observational studies that report on the percentages of children who show pretend play in free play situations (during the second and third years of life) focused on small samples of children, often from middle class families, not representative of wider populations. Other authors note similar observations about the existing pretend play literature (Farver & Howes, 1993; Haight & Miller, 1993;

Lillard, 2015). Thus, there may be an issue with generalising from existing findings, particularly the findings from observational studies. The finding (Chapter 2, Section 2) that some earlier studies that observed more representative samples of children reported fewer than 80 % of children showing pretend play possibly supports this notion (see section 2.2.3). Therefore, the overarching aim of the current study was to use data from the representative community sample of children who participated in the Cardiff Child Development Study (CCDS) to investigate if the vast majority of children do indeed display pretend play during the second half of the second year of life.

4.1.1 The Importance of Using a Variety of Methods to Investigate the Emergence of Pretend Play

The review of earlier findings (Chapter 2, Section 2) indicated that the use of different methods of data collection may lead to different findings on the proportion of children who can show pretend play at different developmental time points, and consequently different findings on the timing of the general emergence of pretend play. The use of observations of free play sessions to assess pretend play abilities may underestimate children's capacity for displaying pretend play at different time points; however, while the use of informant reports as a method of data collection may provide a better measure of the child's pretend play competence because a wide range of situations are seen continuously (Robins et al., 2001; Honey, 2007) there may be confusion over questionnaire wording and informants may report on behaviours not considered 'pretend play' by researchers (Honey, 2007; Inada et al., 2010). Consequently, mixed method approaches that combine observation of children's pretend play with informant report data are important for investigating pretend play rates at different ages. However, as I reported in Chapter 2, few research studies have used a mixture of methods to investigate the rates of pretend play in the same samples of children within the 18 to 24-month age bracket. Further, there are very few studies that have analysed the agreement

across the findings on early pretend play from different methods of data collection statistically (see Chapter 2).

In a recent review of the previous methods used within the pretend play literature base, Thompson and Goldstein (2019) note that most studies of pretend play behaviours use just one type of data collection and the authors recommend for future studies to use various methods to fully understand the phenomenon. As both clinical and educational assessments for developmental delays and disorders rely differently on observations of play in the home or laboratory, or on data provided by informants (see Chapter 1 and 2), it is important to understand if the data from different methods of data gathering show similar proportions of children displaying pretend play, and if there is statistically significant agreement across different measures. The current study aimed to explore the agreement between reported rates of pretend play from different informants (the child's mother and father; other families members; family friends), and rates of pretend play observed from video records of an unstructured free play session in the child's home. The investigation aimed to examine if short, single, observations of free play in the home are useful for identifying children's capacity for pretend play, and secondly, aimed to assess the convergent validity of the newly developed Pretend Play Observational Coding Scheme-Toddler module (PPoCS-T, see section 4.2.3.2 of details of the new scheme) that was used to measure observed pretend play in the current study.

4.1.2 The Importance of Studying the Emergence of Pretend Play with Community Samples Representative of General Populations

Some earlier research suggests that differences in socioeconomic status may be associated with individual differences in children's displays of pretend play (e.g., Udwin & Shmukler, 1981); this possibly indicates issues with generalising to wider populations from many of the previous observational studies of pretend play conducted with middle-class samples of

children. Aspects of a child's physical home environment related to family income level are suggested to be associated with variation in play and pretend play, and speculated to possibly underlie any proposed social class differences in play and pretend play (Fein, 1981; Trawick-Smith, Wolff, Koschel & Vallarelli, 2015; Barreto, de Miguel, Ibarluzea, Andiarana & Arranz, 2017). For example, research has suggested that the toys children have available impacts on the type and amount of play and pretend play displayed (Cherney, Kelly-Vance, Glover, Ruane, & Ryalls, 2003; Trawick-Smith et al., 2015) and that this may account for previous socioeconomic differences found in the literature (Trawick-Smith et al., 2015); economic factors may limit the purchasing of toys found to associated with higher levels of pretend play complexity. Other aspects of the physical home environment such as overcrowding in low income households have also been suggested to impact negatively on children's play (Barreto et al., 2017). There was some evidence from my review of the literature (Chapter 2) of lower rates of observed pretend play in samples of children that were more representative of wider, general, populations (e.g., Quittner et al., 2016) and in samples of children growing up in more adverse environments (e.g., Valentino et al., 2011). However, earlier published reviews of the literature on socioeconomic social class differences in regard to children's pretend play have been inconclusive and report differing conclusions (e.g., Fein, 1981; McLoyd, 1986; Lillard, 2015).

Fein (1981) reviewed the literature on social class differences in pretend play and concluded that the onset of pretend play, and pretend play displayed during the first two years of life, are not affected by social class. However, the author noted that earlier studies investigating social class differences in pretend play often used weak methods and included irregularities in reporting of (or lack of reporting of) statistical findings. Also reviewing the literature on studies that have explored social class differences in pretend, and sociodramatic, play, including reviewing the seminal work of Smilansky (1968) and Eifermann (1971),

McLoyd (1986) noted similar issues with earlier studies not using statistical tests to reach conclusions. McLoyd reported that existing findings in the literature were inconclusive on the matter of social class difference in children's pretend play; although most studies reported that sociodramatic and pretend play were engaged in more frequently by middle class children compared to children from lower social classes, a smaller number of studies found no social class differences, or found children of lower socioeconomic classes were delayed in the age at which pretend play activity peaked compared to middle class children.

In a more recent review of the literature on social class differences in play, Lillard (2015) noted earlier literature to show that middle class groups of children engaged in longer play sessions. Lillard summarised that previous researchers reported that parents having lower education or income levels has been associated with reduced levels of child pretend play. Thus, there are inconsistencies in the findings from previous reviews of the literature on social class, socioeconomic, differences in pretend play; although Fein's (1981) review of the literature suggests that the onset and emergence of pretend play during the first two years of life appears to not be associated with social class differences, it is evident that much of the earlier work on this topic appears to focus on children of 3 years and above. Further, in more recent work, Callaghan and colleagues (2011) carried out interviews with mothers in village settings in Peru and India, and in a rural town in Canada. While there were cultural differences across the locations, there were also socioeconomic differences; the area in Canada comprised predominantly "middle-class" participants, while the participants in India worked predominantly as farmers or material makers. Pretend play was reported in all cultural settings; however, the average age at which pretend play emerged was similar for children sampled from Peru and Canada (23.5 months and 23.8 months of age, respectively), but later for children sampled from the villages in India (31.8 months of age).

While the relationship between social class socioeconomic status (of the child's family) and displays of pretend play has been investigated fairly extensively (although with less attention paid to the toddler years, and some inconsistent findings across the literature), there appears little work investigating how risk of exposure to other measures of *sociodemographic adversity*, such as the mother's age, education and family structure, are statistically associated with displays of early pretend play and the emergence of pretend play during the second year. In two parent and higher income households, parents may have more time to spend with children and therefore more opportunities for play with their children (Farver & Howes, 1993; Pears & Moses, 2003). As it has been found previously that more complex pretend play is displayed when children play with mothers than when alone (Fiese, 1990) family structure may be associated with the emergence and development of pretend play. Mermelshstine and Barnes (2016) found in sample of 400 infants from the United Kingdom that "advanced object play" (p. 303) shown at 10 months during semi-structured play interactions was not associated with maternal age or education, or with the child experiencing, and being exposed, to more "environmental adversity" (p. 302; the measure included factors such as the home having no bath; no garden; no car). However, there seems relatively little work investigating how increased exposure to *sociodemographic adversity* or *social adversity* risk factors (as a collection of risk factors) is associated with the timing of the general emergence of *pretend play* in the second and third years of life. Therefore, a further aim of the current study was to investigate if individual differences in displays of pretend play observed in the home and reported by informants, in a community sample of children studied between 17 and 24 months of age, were statistically associated with maternal social adversity, which include the mothers social class economic status being classified as working class.

An additional aim of the current study was to investigate if individual differences in the two measures of pretend play were associated with child gender. Previous reviews of the literature report that existing findings on gender differences in overall levels of pretend play are contradictory (Fein, 1981; Lillard, 2015); thus further investigation is required.

4.1.3 Research Questions

Data from the Wave 4 Toddlerhood home visit (child age range = 17 to 24 months) conducted as part of the Cardiff Child Development Study (see Chapter 3) were used for this investigation; up to three informants (mothers, fathers, and other family members or family friends) reported on the children's capacity for pretend play via questionnaires, and children participated in an unstructured free play session in the home with a familiar child. Video records of the free play session were later coded for instances of pretend play using the newly developed Pretend Play Observational Coding Scheme-Toddler Module (PPoCS-T).

The study investigated three main research questions:

1. What proportion of children between the ages 17 to 24 months engage in pretend play?
2. Is there statistical agreement between informant reports of pretend play and direct observations of pretend play?
3. Are the individual differences in engagement in pretend play associated with gender, sociodemographic adversity, or chronological age?

For exploratory purposes, to try to understand if any individual differences identified in the current study reflect 'normal' variation in the emergence of pretend play the study also asked, are those children who do not engage in pretend play between 17 and 24 months more likely to be at risk for later developmental problems?

4.2 Method

4.2.1 Participants

The analyses reported in this chapter primarily use data gathered during Wave 4 of the Cardiff Child Development Study. A description of the CCDS study design and general procedure for Wave 4 was presented in Chapter 3, along with information about the participants who took part in the CCDS study. This chapter focuses on families who provided questionnaire data on toddlers pretend play; i.e., the families who completed the ‘what does your toddler do’ questionnaire (and specifically answered Item 33; see section 4.2.3.1).

Figure 4.1 shows the progression of the sample from the 332 families recruited in pregnancy, to the families who provided questionnaire data on toddlers pretend play at Wave 4 of the CCDS study. To investigate the key period of 17 to 24 months of age, children aged 25 months of age and above were excluded from the subsequent analyses (see Figure 4.1).

Questionnaire data on children’s pretend play during the second year of life were therefore available for 244 toddlers. The mean age of the 244 toddlers with informant-reported pretend play data was 20.11 months ($SD = 1.58$).

Of the 244 families who provided questionnaire data on children’s pretend play, additional direct observational evidence of children’s pretend play was also available for 173 of the toddlers (71% of the sample with questionnaire data; see Figure 4.1); the data were derived from observation of the video records from the 20 minute free play sessions conducted at the second home visit at Wave 4 of the CCDS study (see section 3.3.4 for details). There was a requirement of a familiar child to attend the Wave 4 assessment for the free play session to take place; this requirement partially accounts for the reduction in sample size from the questionnaire to observational data sample. The mean age of the 173 toddlers with informant-reported pretend play data and additional direct observational evidence of pretend play was 20.06 months ($SD = 1.50$).

The families of the 244 children who provided questionnaire data on pretend play had significantly lower adversity scores compared to the original CCDS sample (see Table 4.1); however, the gender and ethnicity of the children did not differ significantly from the original sample. This was the same for the families of the 173 children who were observed for pretend play.

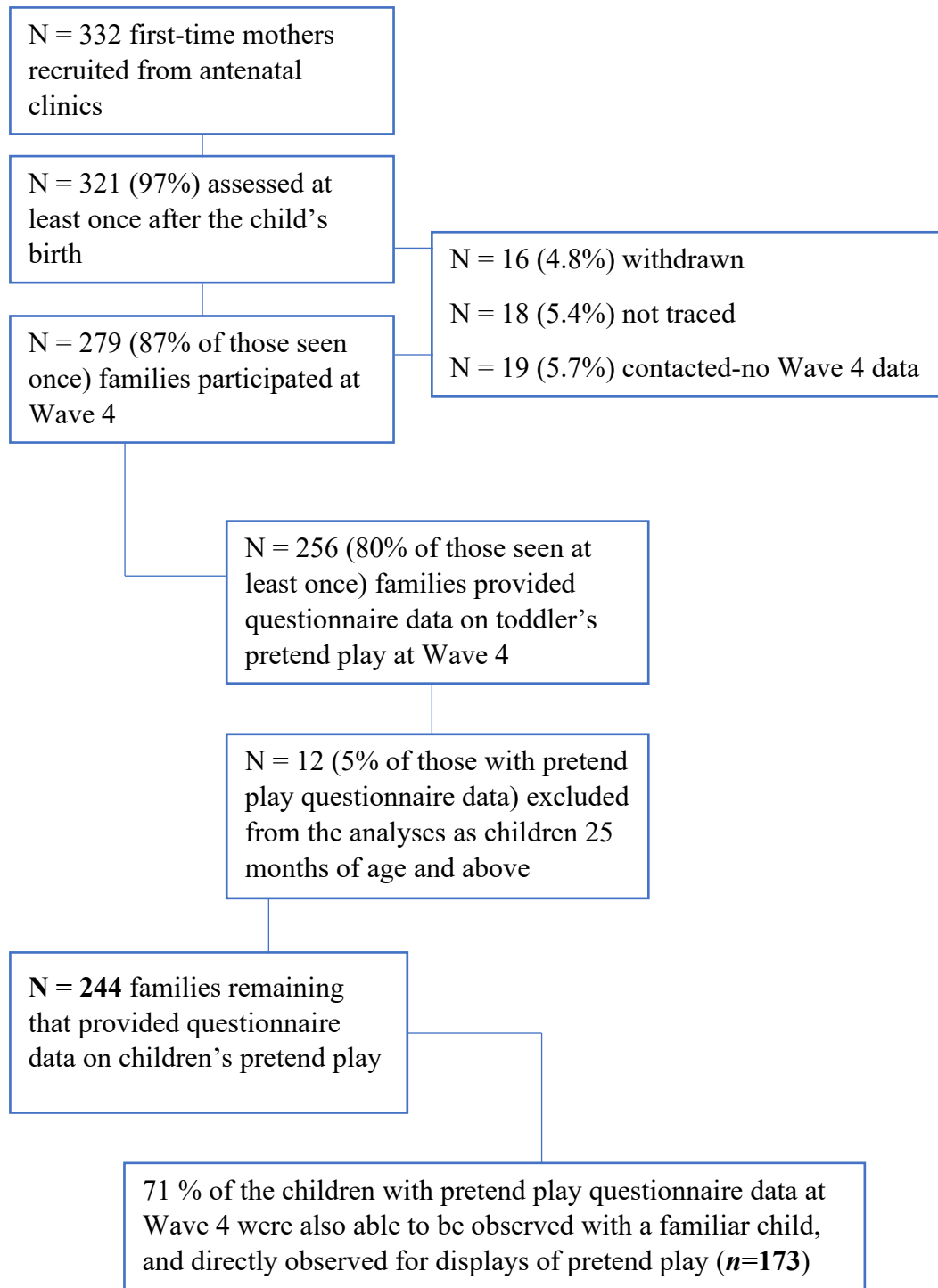


Figure 4.1. The progression of the Cardiff Child Development Study (CCDS) sample from the 332 families recruited in pregnancy, to the families who provided questionnaire data on toddlers' pretend play at Wave 4 of the study, to the toddlers who could additionally be observed directly for displays of pretend play.

Table 4.1

Demographic characteristics for the original participants of the Cardiff Child Development Study (CCDS) and the subsample analysed for informant rated pretend play in Study 1.

Demographic Variables	Original sample recruited in pregnancy	Wave 4 Pretend Play Sample (Informant report data)
	N = 332	N = 244
Mother's Age at Birth (Mean)	28.2 (SD = 6.35)	29.0 (SD = 5.77)
Stable Partnerships	90.4%	92.6%
Marital Status (% married)	50.3%	57%
Ethnicity (% British or Irish)	92.7%	93.2%
Social Class (% middle class)	50.9%	56.6%
Mother's Education (%>basic qualifications)	78.3%	85.7%
Child's Sex (% female)	43.3%	43.9%
Adversity Factor Score (Mean)	.00 (SD = .99)	-.18 (SD = .88)

4.2.2 Procedure

The overall procedures for the Wave 4 assessment, were presented in Chapter 3 (section 3.3.4). The battery of questionnaires provided at Wave 4 was completed by up to three informants: the mother, father and third informant (other family member or family friend). Questionnaires were returned to the study in free post envelopes.

Procedural details for the free play sessions were presented in Chapter 3. The session was scheduled to last for 45 minutes, with the first 20 minutes of the session observed for instances of pretend play. The researchers provided a standard set of toys; however, the children were free to move around the home naturally and play with their own toys, furniture, objects and technology equipment. Figure 4.2 depicts the toys provided by the CCDS researchers: a toy kitchen set (including oven and knobs; hob; toast; washing machine; sink; clock) with removable parts of a frying pan with egg; salt and pepper shakers; spatula (not shown), and additionally a shape sorter and the jack-in-a-box toy.

The analyses in this chapter additionally derive from the informants' providing demographic information during Waves 1 and 2 of the CCDS study, via participation in interviews and completion of questionnaires (see section 3.2.2 and 3.3 for procedural details). Data also derive from the primary caregivers' participation in the visit 1 interview during Wave 6 of the CCDS study (see section 3.3.6 for procedural details).



Figure 4.2. Toys provided by the Cardiff Child Development Study during the Toddler free play, peer interaction, session.

4.2.3 Measuring Pretend Play and Additional Measures

4.2.3.1 Informants' reports of pretend play. The first measure of pretend play was derived from the informant-report questionnaires completed by the CCDS participants (Hay, Perra, et al., 2010). The questionnaires provided to the families at Wave 4 (and Wave 5) of the CCDS study included a measure labelled “*what does your toddler do?*”; the word ‘your’ was modified to the word ‘the’ on questionnaires provided to third informants (i.e., to be appropriate to completion by family friends and additional family members). The measure consisted of 30 items; each item referred to a behaviour and informants were required to indicate whether the child had done each of the 30 behaviours:

Below is a list of things that children may begin to do as they get older. Some of them your child will already be doing and others are things s/he won't have started yet, or may not do at all. Please **TICK (✓)** the box that indicates whether your child has done these things.

Informants responded to each item on a three-point scale: *Not True*; *Somewhat True*; *Certainly True*. Four items drew upon wording from four items included on The Checklist for Autism in Toddlers (CHAT; Baron-Cohen et al., 1992,1996, see section 2.2.8 for full information on the CHAT instrument). Item 33, using wording from the CHAT instrument, asked respondents if the child does the behaviour: “*pretend to make a cup of tea using toy cup and teapot, or pretend other things*”.

The informant's responses on Item 33 were used to calculate a pretend play score for the child. The item (and all items on the measure) was coded as: *Not True* = 0, *Somewhat True* = 1, *Certainly True* = 2. Children could receive up to three pretend play scores (e.g., a score from the mother; a score from the father; a score from a third informant, e.g., family member or family friend). The mean of the scores was calculated and used in subsequent data

analyses requiring a continuous measure of the child’s pretend play. Mean scores ranged from 0 - 2. Mean scores of .00, .33, .50, .67 indicate that at least one informant described the child as (0) not yet showing any pretend play (a score of 1, or 1.33, could also indicate this but would also indicate that one, or two, of the other informants additionally rated the child as (2) *certainly* showing pretend play). A mean score of .00 meant that all informants rated the child as not yet displaying pretend play, and a mean score of 2.00 meant that all informants rated the child as *certainly* showing pretend play.

I converted the mean scores into a categorical measure, to provide a pretend play score across informants using the original three-point response scale (see Table 4.2 for how mean scores were converted in the categorical measure). Additionally, I created a dichotomous measure: *Not yet showing pretend play* (0) or *showing pretend play* (1) using the mean scores (see Table 4.3 for how mean scores were converted to create the dichotomous measure).

Table 4.2

Process of converting mean pretend play questionnaire scores (across mothers, fathers, and other family members or friends) into a categorical measure of informant-reported pretend play.

Mean pretend play score	Converted categorical score
.00, .33, .50, .67	0 = <i>Not yet displaying pretend play</i>
1.00, 1.33, 1.50, 1.67	1 = <i>Sometimes shows pretend play</i>
2.00	2 = <i>Certainly shows pretend play</i>

Table 4.3

Process of converting mean pretend play questionnaire scores (across mothers, fathers, and other family members or friends) into dichotomous measure of informant-reported pretend play.

Mean pretend play score	Converted dichotomous score
.00, .33, .50, .67	0 = <i>Not yet showing</i> pretend play
1.00,1.33,1.50.1.67, 2.00	1 = <i>Showing pretend play</i>

4.2.3.2 Newly Developed ‘Pretend Play Observational Coding Scheme’ (PPoCS):

Toddler module (PPoCS-T). A second measure of pretend play was derived from observation of the video records of children participating in the free play, peer interaction sessions during the home visit. Measurement of pretend play began at the beginning of the free play session, and finished after 20 minutes of continuous observation time. At the beginning of Study 1, using a random subsample of the video records and previous literature, I developed a new observational coding system for identifying instances of pretend play: The Pretend Play Observational Coding Scheme - Toddler module (PPoCS-T; presented in Appendix C). After the development phase, the new coding scheme was then applied to the full sample of the video records.

4.2.3.2.1 Development of the PPoCS: Conceptualisation. Of central importance in developing the new observational coding scheme was to develop clear operational definitions that defined key exaggerated and elaborated movements and sound effects (i.e., ‘pretending signals’) accompanying children’s actions performed with toy cooking, eating and dining equipment (and other toys) that signify the meaning of the actions as play, as distinct from engagement in exploratory activities. Central to the development of the new scheme were the ideas set forth in Chapter 2 about the importance of excluding actions that may be *afforded* by the salient, physical features of the object (Gibson, 1979; Rubin et al., 1983; Rocissano,

1982; Haight & Miller, 1993); it is important to distinguish actions that may be explained by the clear affordances of physical objects and could represent discoveries made during exploration of the physical objects from acts of pretend play. For example, lifting a cup to the mouth and chewing on the cup may be *afforded* by the side of cup fitting inside the child's mouth, without necessarily meaning that the child is performing a non-literal *drink*; when banging a spoon from side to side in a bowl, the objects may afford making a banging noise, and do not necessarily mean that the child is enacting a non-literal *stir*; if the child places a bowl on the head, the shape of the bowl affords placement on the head, and does not necessarily mean that the child is *substituting* the bowl as a hat.

For evidence of pretend play, I discussed in Chapter 2 the importance of observing behavioural signals of play accompanying children's actions, in particular *exaggeration and elaboration* (e.g., exaggerated mouth movements towards a piece of plastic food; head tilted back with cup at mouth); *sound effects, confirmatory speech* (maybe modified tone); *smiling*; *repetition* (as noted by Piaget, 1962; Garvey, 1977; Burghardt, 2010, and others, see section 2.1.2). For example, putting a cup to one's mouth accompanied by full elaborated rotation of the cup signifies: "what can I do with this object" play criteria rather than, "what is this object, what can it do" exploration criteria (Rubin et al., 1983 p. 699) and ensures the actions have moved past the simple affordances of objects. The elaborated gesture (e.g., full rotation of cup, or head tilted fully back) may indicate the child is referring to an absent past (McCune, 1993) e.g., a memory of drinking, rather than just guided by the physical and literal environment. The playful and pretending signals reflect that the orientation of the child is non-serious (for fun) and non-literal (Garvey, 1977; Weisberg, 2015).

In developing the new observational coding scheme, I aimed to improve on the previous observational measures of pretend play reviewed in Chapter 2. My review of previous early pretend play coding schemes used with children up to 18 months old (Chapter

2) indicated that the operational definitions included on previous observational coding schemes used in infant play research often made no reference to any of these key behavioural signals of play, or where the behavioural signals were noted, or alluded to, the definitions were not consistently, clearly, or fully described for each type of pretend play action (see Chapter 2).

The operational definition criteria I developed are in line with those employed by McCune (1995) and Nielsen and Dissanayake (2004), which also required pretend actions to be accompanied by an exaggerated gesture or sound effect (e.g., head tilted fully backwards; open mouth chewing actions; eating sound effects) to be counted as pretend play; however, these authors, and others did not define these behavioural signals of play consistently for each type of possible enactment performed with toy cooking and dining equipment. This possibly indicates that some behaviours labelled as pretend play in previous studies were not based on clear evidence for the child engaging in play. By developing, and using, the new coding scheme, with the new operational definitions that included definitions of these ludic indicators, I aimed to supply clear evidence of the children in the peer visit procedure engaging in pretend play as distinct from simply responding to the affordances of the play objects; conservative and reliable measurement of pretend play is essential to study of its emergence.

4.2.3.2.2 Development of the PPOCS-T: Procedure. Initial observation of a random selection of 12 video records⁸ of the free play observation with a familiar child was carried out by a psychology intern student and myself; the student later coded 69% of the video records for instances of pretend play using the PPOCS-T. Instances of possible non-literal, ‘as if’, and transformational pretend play actions with the toy kitchen set, shape sorter, jack in a

⁸ 7% of the sample of children with available video records, prior to excluding children aged 25 months and above from the study.

box toy, and common toys in the homes, and any accompanying signs of elaboration, exaggeration and other *play* signals were recorded. The Pretend Play Observational Coding Scheme-Toddler Module manual was developed from the initial observations; the ideas set forth in Chapter 2 and above (i.e., excluding behaviours afforded by the salient features of the object [e.g., Gibson, 1979; Rocissano, 1982; Rubin et al., 1983; Haight & Miller, 1993]; the types of pretend actions expected in this developmental period; the importance of the child being focused and actively engaged; the importance of pretend actions to be accompanied by an exaggerated or elaborated gesture or sound effect [e.g., McCune, 1995; Williams et al., 2001; Nielsen & Dissanayake, 2004]); consultation of previous coding schemes for measuring play and pretend play, and other relevant literature (see below) and consensus sessions with the PI of the CCDS project. Table 4.4 presents the pretend play enactments included and operationally defined on the PPOCS - Toddler module. See Appendix C for presentation of the full manual and coding definitions.

Table 4.4

Pretend play enactments included and operationally defined on the Pretend Play

Observational Coding Scheme (PPOCS) - Toddler module.

Pretend to drink	Pretend to sleep
Pretend to eat	Pretend to spoon a substance from one container to another
Pretend to spoon food into mouth	Pretend to chop/slice/ cut
Pretend to feed other/ pretend offer (peer; adult)	Pretend to stir
Pretend to feed other/ pretend offer (inanimate object)	Object substitution
Pretend to talk on the telephone	Verbally attributes absent properties to object or situation
Pretend to pour (pretend to add)	Verbal statement of pretend activity
Pretend to season	Acts on an object with accompanying pretend (non-literal/as-if) verbalisations/ sounds/noises

Earlier literature and previous coding schemes were used as a guide to the specific types of enactments expected with the toys available during the Toddler free play session (e.g., *pretend to drink; pretend to eat; object substitution; verbally attributing absent properties*);). Some enactments were created fully from initial observation of the video records, e.g., *pretend to season; verbal statement of pretend activity*) and were used to inform some of the operational definitions for the specific types of enactments, with some existing operational definitions amended, extended or merged based on the initial observations; the vast majority of the coding definitions were operationalised from the video observations (and consensus discussions). Piaget's (1962) observation that make-believe begins when children "pretend" at an action was central to the development of the coding scheme, as were ideas from a scheme developed for use with preschool children (Howe, Petrakos, & Rinaldi, 1998), which focused on identifying when children performed *pretend enactments*. Further additional key references used in the scheme development included: Lowe (1975); Nicolich (1977); Watson and Fischer (1977); Fenson, (1978); Garvey (1977); Fenson and Ramsay (1980); McLoyd (1980); Belsky and Most (1981); Hill & McCune-Nicolich (1981); Ungerer and Sigman (1981); Fein, Moorin and Enslein (1982); Rubin et al. (1983); McCune-Nicolich and Fenson (1984); Fenson (1984); Baron-Cohen (1987); Leslie (1987); Tamis-LeMonda and Bornstein (1991); Ogura (1991); Lewis, Boucher and Astrell (1992); Haight and Miller (1993); McCune (1995); Libby et al. (1998); Williams et al. (2001); Veneziano (2002) Lewis and Ramsay (2004); Nielsen and Dissanayake (2004); Baranek et al. (2005); Barton (2007; 2010); Ebeling (2011); Lillard and Kavanaugh (2014).

Descriptions of the experimenter modelling sessions that accompanied some of the free play situations in past studies (see Appendix A) provided useful guidance on the types of exaggerations and enactments that should be part of the new observational coding scheme. Vondra and Belsky (1991) discussed using Belsky and Most's (1981) developmental scale

(see Appendix A) to assess infant play competence (rather than performance) in a structured modelling-based task. In the ‘Pretend-self’ category there was detailed information about important exaggerations that should be enacted by the experimenter: “Places the miniature spoon to his or her own lips, exaggerating its tilt and making eating noises while pretending to feed her or him-self” (p. 20). A similar level of detail was provided in the ‘Pretend-other’ category: “Exaggerated actions and makes ‘eating’ noises while tipping the spoon towards the doll’s mouth” (p. 21). Similarly, Dixon & Shore (1991; see Appendix A) referred to tilting actions and sound effects when describing the experimenter instructions for the ‘Pretend breakfast scenario’.

I also examined some examples of adults displaying the exaggerated play signals. For example, Lillard and Witherington (2004) analysed mothers’ behaviour with their 18-month-old children in either a pretend snack condition, or a real snack condition. In the pretend condition the mothers smiled significantly more, held food at their mouths for significantly longer when pretending to eat than when actually eating (although significantly shorter for pretend pouring and drinking) and produced significantly more sound effects (e.g., eating, drinking and pouring noises) than in the real snack condition.

Assessment instruments for early identification of developmental disorders also supplied guidance on the types of enactments expected during the toddler years. As part of the Modified Checklist for Autism in Toddlers, Revised, with Follow-Up (M-CHAT-R/F; Robins et al., 2009; see Chapter 2), parents of children between 16 and 30 months of age are asked to report on the item, “Does your child play pretend or make-believe? (FOR EXAMPLE, pretend to drink from an empty cup, pretend to talk on a phone, or pretend to feed a doll or stuffed animal?)” (p. 3). As part of the Social Attention and Communication Study, (Barbaro & Dissanayake, 2012) designed to identify infants at risk of autism (see Chapter 2), the pretend play assessment item instructed nurses to:

Give the child a toy cup and pot. Say ‘Can you pour a drink and drink it?’ Does the child pretend to pour a drink and/or drink it? (Other examples include feeding the teddy with a spoon or using a pretend phone to call teddy) (Barbaro & Dissanayake, 2012, p. 84).

Because the measurement of pretend play included observation of children’s actions with their own toys and other elements not standardised in the environment, it was necessary to ensure that the coding system would cater for unexpected pretend play enactments not explicitly included on the coding scheme, i.e., the enactments presented in Table 4.4. For example, one child was observed to *pretend to take a shower*. It was not considered necessary to create new operational definitions for such rare enactments⁹. Therefore, the manual provided guidance for coding such enactments (refer to p. 314 of the manual in Appendix C). Additionally, each enactment was also awarded an overall pretend play code (refer to Table 4.5 for overall pretend play codes and operational definitions, also refer to Appendix C; Table 1); Figure 4.3 depicts this coding process: coders were required to transcribe the pretend play enactment observed (with the time the enactment began), e.g., ‘00:16:55: *pretend to drink*’. Following this, they awarded the pretend play code e.g., SP *pretend action toward self*; this allowed for unexpected enactments to be coded if actions met the guidance provided on p. 314 of the manual (e.g., exaggeration, elaboration, sound effect, other clear signals of pretending, were observed,). The pretend play action could be coded as more than one type of pretend play (e.g., OS+V). Examples of coded transcripts from observation of the video records from the Toddler free play session are presented in Appendix G, to provide further illustration of the coding process. The overall pretend play codes were partly derived from

⁹ Such non-verbal pretend enactments were rare; ‘pretend’ enactments not anticipated prior to data coding, i.e., those performed with additional objects in the child’s home, were mostly captured using the verbal pretend play and object substitution codes/operational definitions, e.g., *verbally attributes absent properties to object or situation*

earlier pretend play coding schemes (e.g., Belsky & Most, 1981; Russell & Raineck, 1981; Fenson; 1984; Shimado & Sano, 1984; Baron-Cohen, 1987; McCune, 1995).

Table 4.5

Overall pretend play codes from the Pretend Play Observational Coding Scheme

Pretend Play Code	Operational Definition
Pretend action toward self (SP)	Pretend action directed towards self/ own body (e.g., pretend to drink; pretend to eat; pretend to talk on the telephone) OR Pretend enactment of self-related familiar activity (e.g., pretend to sleep)
Pretend action towards object (O)	Pretend action directed towards object (e.g., pretend to pour; pretend to season; pretend to stir)
Pretend action towards other (OP)	Pretend action directed towards parent, sibling, peer, inanimate object (e.g., teddy bear, doll)
Object substitution (OS)	Transforms one object into a different object “The use of one object as if it were a different object” (Ungerer & Sigman, 1981, p. 324) One object stands in for another object (Olson & Campbell, 1988) Can include transforming body part into an object.
Verbal pretend play enactment (V)	See Appendix C & E for operational definitions

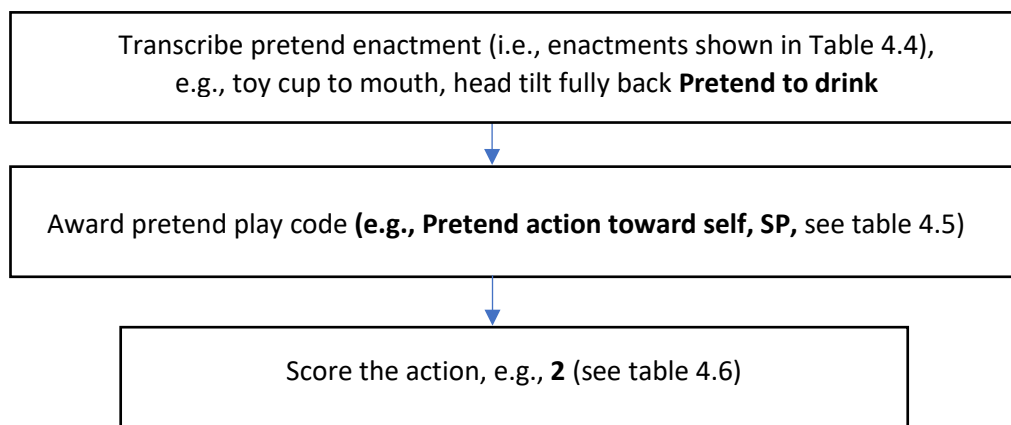


Figure 4.3. Process of recording, coding and scoring pretend enactments observed from video records

To improve reliability and produce a conservative measure of pretend play, observers were required to rate the confidence of their judgements on a 2-point scale (see Table 4.6; Figure 4.3; and Appendix C). A score of 2 was given for each act of pretend play that fully met the coding definitions, whereas a score of 1 was awarded for an act of possible pretend play. Possible pretend acts extended beyond simply mouthing or raising a cup to the lips but did not fully meet the requirements of the pretend play coding definitions outlined in Appendix C. To ensure that only enactments meeting the exaggerated or elaborated definitions were measured, only enactments awarded a Level 2 score were included in the subsequent analyses.

Table 4.6

Rating scale used to score each pretend play act

Coder Rating	Rating definition
0	The coder does not observe the action to fit the coding definitions for pretend play.
1	The coder is unsure whether an observed action is a pretend play action. An act of possible pretend play. Possible pretend play acts extend beyond simply mouthing or raising a cup to the lips, but do not fully meet the operation definitions outlined in Table 1 [Appendix C]. A score of 1 could be awarded for an action where the key coding elements are not fully visible, or the child is not focused on the action but meets other operational definitions. If the view is very restricted code as 0.
2	The coder observes the child to perform an act of pretend play (e.g., the action fully meets the coding definitions described in Table 1 [Appendix C].)

4.2.3.2.3 Creating variables.

4.2.3.2.3.1 Displaying any pretend play. A dichotomous variable *pretend play observed* was created, with children assigned a score of either 0 or 1 to indicate whether the participant displayed any pretend play at Level 2 at all during the free play session (*pretend play observed*, 0 = no pretend play displayed, 1 = displayed pretend play). Following McCune (1995), only one observation of a pretend play enactment was required for the child to be considered as displaying pretend play and to be assigned a score of 1 on this

dichotomous variable. Similarly, Rutherford and colleagues (2007) noted that a child displaying one enactment of pretend play was sufficient to demonstrate competence for engagement in pretend play.

4.2.3.2.3.2 *Frequency of pretend play*. The total number of pretend enactments was calculated (counted) for each participant. The *frequency of pretend play* measure was a composite variable that summed across the different types of pretend play; the measure represents the total number of pretend play enactments observed. The conceptualisation for what counted as a separate pretend play enactment, and informed how enactments were transcribed, broadly followed ideas set forth by Zinober and Martlew (1985), where, the “basic unit of behaviour could consist of either an act...a vocalization occurring alone...an act accompanied by a vocalization; an act immediately followed by a related gesture and/or vocalization; or a co-occurring gesture and vocalization” (see coded transcripts in Appendix G;H;I for examples of how enactments were separated during the coding process). Further, the conceptualisation of pretend play speech provided by Veneziano (2002) was broadly followed (discussed in Chapter 2, section 2.1.3.3); if a verbalisation (or sound effect) supported, confirmed, or accompanied a pretend enactment defined on the coding scheme, this was counted as one pretend enactment. For example, *pretends to drink* and speaks, ‘yum!’; rotates plastic container towards cup and speaks, ‘some more, some more’; *pretend offer* tea to peer, speaks, ‘here’s tea’; places bowl on head and speaks, ‘hat!’. See Appendix G; H; I for examples of coded transcripts.

Where numerous speech segments followed an act, for example, the child lifted play food to their mouth and performed a deliberate biting action accompanied by an eating sound effect, the sound effect supported the coding of the action as a pretend enactment (SP+V); and was counted as one enactment. If one second later the child vocalised, “Very nice!” (V) and then two seconds later vocalised, “I’ve eaten it” (V), following McLoyd (1980) where an

“utterance was defined as any word or string of words communicating one thought or idea or any non-lexical item associated with a sound property of an imaginary or real object” (p. 1135) if the speech portrayed distinct meanings, it was transcribed with different time codes and counted as separate enactments. In the example above, the first meaning can be considered as non literal ‘eating’, the next meaning as non-literal ‘taste’ of the food and the last meaning as the child reporting on the non-literal pretend act that has just occurred. In contrast, if the child verbalises, ‘some more, some more’ (while tilting a plastic container above a cup to pretend to pour), then further speaks, ‘some more, some more, some more’ here the speech can be considered part of one idea. However, if there was a break in a string of words or vocalisation, or a break in an action with supporting vocalisation, e.g., the child is moving a toy car with accompanying ‘brum, brum, brum’ verbalisations, but stopped moving the car, turned the car around and repeated the movement with additional ‘brum, brum, brum’ verbalisations, then this was counted as two verbal pretend enactments.

4.2.3.2.4 Establishing reliability. To measure the initial reliability of the coding scheme across observers, two observers independently coded a random selection of 18 videos (10% of the video records) prior to applying the toddler module of the PPOCS-T to the full sample of free play video records; the 18 participants in the initial reliability sample were different to those used in the development of the scheme. Inter-rater reliability for the dichotomous measure of displaying at least one instance of pretend play was measured using the Kappa statistic. The initial value of Kappa was .64 for the dichotomous measure; Landis and Koch (1977) considered agreement values of Kappa between .61 and .80 as “substantial” agreement (p. 165). Some further amendments were made to the coding manual following discussions and consensus agreement meetings during the data coding process; final reliability of the coding scheme across observers was assessed at the end of coding all the available toddler free play video records for pretend play.

Following completion of coding the 180 available video records of the free play session with the PPoCS-T, to analyse the reliability of the final coding scheme $n = 39$ randomly selected free play videos were independently coded by two observers (22% of the final observed sample). Inter-rater reliability for the dichotomous measure of displaying at least one instance of pretend play was measured using the Kappa statistic, there was excellent agreement across observers, $\kappa = .87$ (Landis & Koch, 1977; Cicchetti, 1994). Intraclass correlation coefficients (ICC) were calculated to measure agreement across the observers for the frequency of pretend play recorded; ICC inter-rater agreement indicated excellent observer agreement for this continuous measure of pretend play, $ICC = .89$ (Cicchetti, 1994).

4.2.3.3 Sociodemographic adversity score. See section 3.2.2 for full details. Positive scores indicate the child has had higher than average exposure to maternal factors known to be associated with risk for social adversity (e.g., the mother aged 19 years or younger at the time of child's birth; not achieving basic qualifications; occupation being classified as working class; being unmarried or not in stable partnership during the pregnancy). Sociodemographic adversity scores were available for all of the 244 families who provided questionnaire data on children's pretend play at Wave 4.

4.2.3.4 Referrals for developmental problems. As part of the interview with the primary caregiver at Wave 6 of the CCDS study, caregivers were asked a question about whether the child had seen any specialists (e.g., educational psychologist; clinical psychologist; psychiatrist) about any developmental problems (e.g., dyslexia, ADHD, autism). The primary caregiver's responses were used to create a dichotomous measure of 0 = no referrals, 1 = referred to specialist for investigation for possible developmental difficulties. Of the 173 children with pretend play data provided from both informant reports and direct observations, 153 families provided data on later referrals for developmental difficulties.

4.3 Results

4.3.1 What Proportion of Children between the Ages 17 to 24 Months Engage in Pretend Play?

4.3.1.1 Proportion of children reported to engage in pretend play by informants.

There was significant agreement across informants (mother; father; third informant) on children's displays of pretend play, see Table 4.7; therefore, all analyses in this chapter used composite variables that combined data across the multiple informants. Questionnaire data were available for 244 children. Of those, 118 (48.4%) had a mean pretend play score of 2.00. Therefore, nearly half of the children were rated as *certainly* engaging in pretend play by all informants. In contrast, 23 children (9.4%) had a mean pretend play questionnaire score of .00; a mean score of .00 means that all informants rated the child to be not yet showing pretend play. When the mean scores were converted into the dichotomous measure of *not yet showing pretend play* (0) or *showing pretend play* (1), 202 children (82.8%) were categorised as *showing pretend play*, with 42 children (17.2 %) categorised as *not yet showing pretend play*; thus, around 17 % of the toddlers were rated as not yet showing pretend play by least one informant (and additionally not reported as *certainly* pretending by any other informants). The mean age of children categorised as *not yet showing pretend play* was 19.67 months ($SD = 1.38$), compared to a mean age of 20.20 months ($SD = 1.61$) for children categorised as *showing pretend play*, this was not a significant difference.

Table 4.7

Correlations between informants who reported on toddler pretend play at the W4 assessment

	1.	2.	3.
1. Pretend play score reported by mother	-	.50** (191)	.46** (190)
2. Pretend play score reported by father		-	.39** (162)
3. Pretend play score reported by third informant			-

Note. ** $p < .001$. n shown in parentheses

4.3.1.2 Proportion of children observed to show pretend play during the home observation. Additional direct observational evidence of pretend play was available for 173 children, 71% of the sample with informant-rated pretend play data. During the twenty-minute observation period, 61 children displayed at least one instance of pretend play; see Figure 4.4. Therefore, just over a third of toddlers were observed to display pretend play within twenty minutes of observation in the home environment. Where toddlers engaged in pretend play, their *frequency of pretend play* varied from one to 40 enactments. It was most common however for children to engage in fewer than five pretend play enactments; Figure 4.5 depicts the frequency distribution of the number of pretend play enactments shown during the observation in the home environment. The mean *frequency of pretend play* was 3.79 enactments ($SD = 10.59$).

Of note, of the 61 toddlers who displayed pretend play, 54 % displayed at least one enactment of *pretend action toward self* (e.g., *pretend to drink*; *pretend to eat*). In comparison, only 15% of the toddlers who engaged in pretend play showed an enactment of *object substitution*; the number of children who displayed each type of pretend play enactment is shown in Table 4.8.

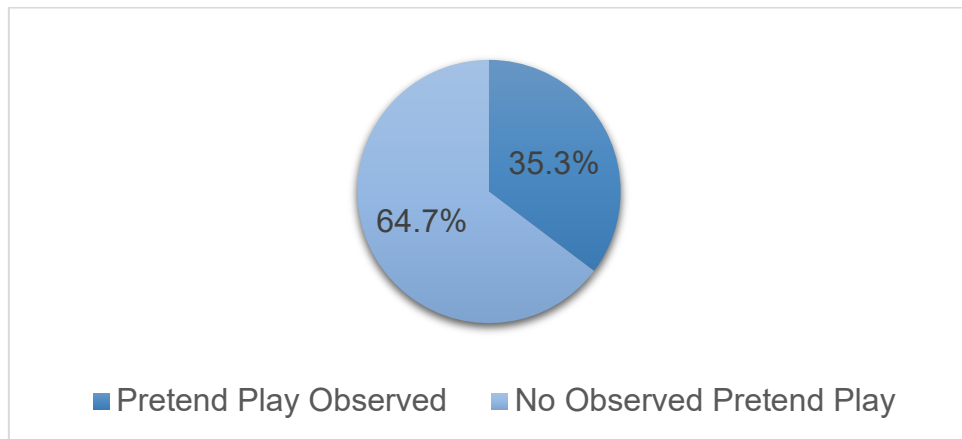


Figure 4.4. Percentage of children observed to display at least one pretend play enactment during the free play session in the child's home environment.

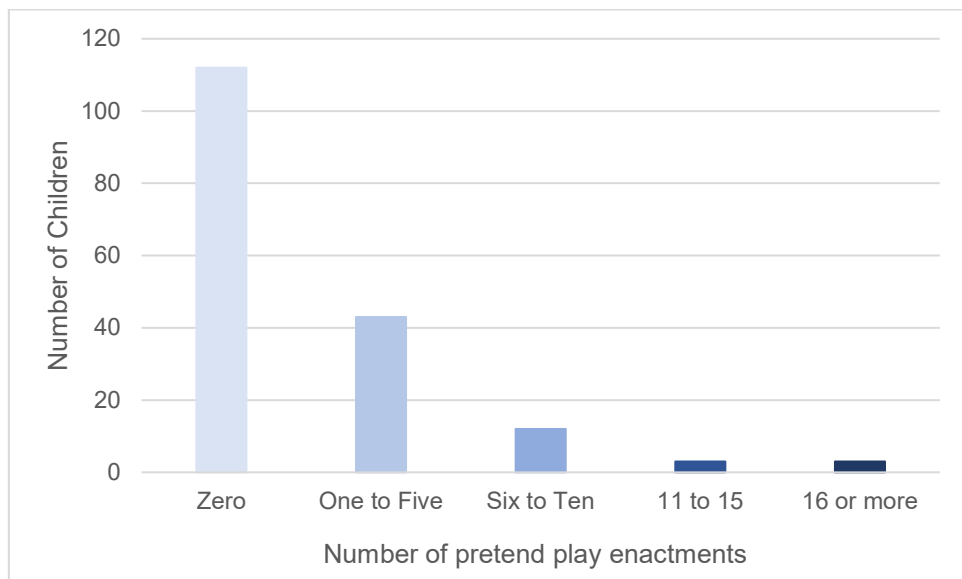


Figure 4.5. Frequency distribution of number of pretend play enactments displayed during the free play session in the child's home environment.

Table 4.8

Number of children displaying each type of pretend play during the free play session in the child's home environment

Pretend play type	Number of children displaying at least one enactment of that type of pretend play		
	<i>N</i>	% of those who showed any pretend play	% of full sample observed at W4
Pretend action toward self (e.g., pretend to drink; pretend to eat)	33	54%	19%
Pretend action toward object (e.g., pretend to pour; pretend to stir)	25	41 %	14%
Pretend action toward other (e.g., pretend to feed other)	10	16%	6%
Object substitution	9	15%	5%
Any verbal pretend play enactment	40	66%	23%

Note. Verbal pretend play enactments include where the verbal enactment 'duplicates,' 'specifies' or 'creates' the pretend play, see section 2.1.3.3; for example, the verbal enactment could duplicate the coding of a different category of pretend play, e.g., child pretends to drink with exaggerated tilt (pretend action toward self), accompanied by a slurp (verbal pretend play enactment) or the verbal enactment could be considered *to be* the pretend enactment, e.g., child runs across the room and shouts, 'I am batman!'.

4.3.2 Is There Statistical Agreement between Informant Reports of Pretend Play and Direct Observations of Pretend Play?

Data on children’s pretend play provided from both informant reports and direct observations were available for 173 children. As shown in Table 4.9 and 4.10, at least¹⁰ 25 (14%) children were classified as displaying no observed pretend play by researchers and reported as *not yet* engaging in pretend play by at least one questionnaire informant (dichotomous variable created from the mean scores across informants).

Table 4.9

Cross tabulation of pretend play observed variable and informant-rated pretend play data (converted dichotomous variable from mean scores across informants)

<i>Pretend Play Observed</i>	<i>Questionnaire Response</i>	
	<i>Not yet showing pretend play</i>	<i>Showing pretend play</i>
No observed pretend play	25 (14%)	87
Pretend play observed	4	57

¹⁰ “At least” used because some children in the *showing pretend play* informant-reported dichotomous category may have also been reported as *not yet showing* pretend play, but were also reported by one, or two, of the other informants additionally as (2) *certainly* showing pretend play

Table 4.10

*Cross tabulation of pretend play observed variable and informant rated pretend play data
(converted categorical variable from mean scores across informants)*

<i>Pretend Play Observed</i>	<i>Questionnaire Response Category</i>		
	<i>Not yet</i>	<i>Sometimes</i>	<i>Certainly</i>
	<i>showing</i>	<i>shows</i>	<i>shows</i>
	<i>pretend play</i>	<i>pretend play</i>	<i>pretend play</i>
No observed pretend play	25 (14%)	37	50
Pretend play observed	4	23	34

The proportion of toddlers reported to engage in pretend play by informants (converted dichotomous variable) was significantly larger than the proportion of toddlers directly observed to show pretend play during the home observations (McNemar’s test, $p = .000$). Nonetheless, there was also significant agreement across the findings; a statistically significant positive relationship was found between the mean pretend play questionnaire score reported by mothers, fathers, and other family members or friends and the dichotomous variable derived from the observational data (*pretend play observed: yes or no*), $r_{pb}(173) = .19, p = .01$.

4.3.3 Are the Individual Differences in Engagement in Pretend Play Associated with Gender, Sociodemographic Adversity, or Chronological Age?

The individual differences found with displaying at least one pretend play enactment during the home observations will be explored first, followed by the investigation of the individual differences found in informant-reported pretend play.

4.3.3.1 Individual differences in displays of pretend play during home

observations. In the sample of children with additional observational evidence of pretend play ($n=173$), 31 girls (39.7% of the girls) and 33 boys (31.6% of the boys) displayed a least one pretend play enactment, which was not a significant difference. Nor was there an association between *observed pretend* and the family's *sociodemographic adversity score*. However, the children who displayed at least one enactment of pretend play ($n= 61$) were significantly older in months ($M = 20.44$, $SD = 1.46$) than the children for whom no pretend play was observed during the home observations ($M = 19.85$, $SD = 1.49$), $t(171) = -2.527$, $p = .01$.

4.3.3.2 Individual differences in reported pretend play engagement. The pattern for the questionnaire data was somewhat different to the findings with the observational data.

4.3.3.2.1 Associations with sociodemographic adversity. With the *sociodemographic adversity score*, there was a significant negative correlation between mean pretend play scores across informants and mean *sociodemographic adversity scores*, $r(244) = -.29$, $p = .000$; higher factor scores on the *sociodemographic adversity* measure indicate more exposure to sociodemographic adversity.

Looking at the categorical measure of pretend play created from the mean questionnaire scores, Table 4.11 shows the mean *sociodemographic adversity* factor scores for children categorised as *not yet showing pretend play*, *sometimes shows pretend play*, or *certainly shows pretend play* using the informant rated data. The data show that children categorised as *not yet showing pretend play* had the highest levels of exposure to *sociodemographic adversity* ($F = 8.858$, $p < .001$, effect size = .07.) Tukey post hoc analyses, used because there was homogeneity of variances (Levene's test, $p = .051$), revealed a significant difference between the *sociodemographic adversity* factor scores for children

categorised as *not yet showing pretend play* and *sometimes shows pretend play*, and between children *not yet showing pretend play* and *certainly shows pretend play*. However, there was no significant difference between the adversity scores for children categorised as *sometimes* and *certainly showing pretend play*. A similar pattern of results was found when looking at the toddlers reported to *not yet* display pretend play by *all* informants ($n = 23$), those toddlers reported to *certainly* engage in pretend play by *all* informants ($n = 118$), and the remaining group of toddlers where at least *one* informant had observed the child to *sometimes* engage in pretend play¹¹ ($n = 103$); the mean *sociodemographic adversity* factor scores for these three groups of toddlers are shown in Table 4.12. Children who had been consistently reported by *all* informants to *not yet* show pretend play experienced the highest levels of exposure to *sociodemographic adversity* ($F = 11.67, p < .001$, effect size = .08.). Games-Howell post hoc analyses revealed a significant difference in *sociodemographic adversity* levels between the children reported to not yet show pretend play by *all* informants and those reported to *certainly* show pretend play by *all* informants, and between the children reported to not yet show pretend play by *all* informants and those reported to *sometimes* engage in pretend play by at least *one* informant. There was no significant difference between the adversity scores for children reported to *certainly* show pretend play by *all* informants and those reported to *sometimes* engage in pretend play by at least *one* informant. Taken together, the findings possibly indicate that it is the competence to perform pretend play that is negatively associated with adversity experiences, rather than the performance of pretend play.

¹¹ Other informants may have reported the child to *sometimes* show pretend play; alternatively, other informants may have reported the child to *not yet* show pretend play or *certainly* show pretend play. There is inconsistency in this group of children.

Table 4.11

Mean sociodemographic adversity factor scores for children rated as not yet showing pretend play, sometimes shows pretend play, or certainly shows pretend play by mothers, fathers, and other family members or friends (categorical measure converted from mean questionnaire scores)

Questionnaire Category	Mean sociodemographic adversity factor score (<i>SD</i>)
Not yet showing pretend play (<i>n</i> =42)	.31 (1.02)
Sometimes shows pretend play (<i>n</i> =84)	-.23 (.87)
Certainly shows pretend play (<i>n</i> =118)	-.33 (.78)

Table 4.12

Mean sociodemographic adversity factor scores for children rated as not yet showing pretend play by all informants, sometimes shows pretend play by at least one informant, or certainly shows pretend play by all informants

Questionnaire Category	Mean sociodemographic adversity factor score (<i>SD</i>)
Reported as not yet showing pretend play by <u>all</u> informants (<i>n</i> =23)	.60 (1.14)
Reported as sometimes shows pretend play by at least <u>one</u> informant (<i>n</i> =103)	-.20 (.85)
Reported as certainly shows pretend play by <u>all</u> informants (<i>n</i> =118)	-.33 (.78)

4.3.3.2.2 *Associations with child gender.* The mean pretend play questionnaire score for girls ($n=107$) was significantly higher ($M = 1.55, SD = .63$) than that for boys ($n=137$) ($M = 1.12, SD = .78$), $t(242) = 4.60, p = .000$. Looking at the categorical measure of informant-rated pretend play created from the mean questionnaire scores it was evident that more boys than girls were reported to be *not yet showing pretend play* by informants (see Table 4.13) and more girls than boys were reported to *certainly show pretend play* ($\chi^2(2) = 19.64, p = .000$). On further inspection of the data, it was evident that the boys with available pretend play questionnaire data were exposed to higher levels of social adversity (Mean *sociodemographic adversity score* = $-.05, SD = .96$), than the girls (Mean *sociodemographic adversity score* = $-.36, SD = .74$), $t(241.9) = -2.86, p = .005$; thus, differences in exposure to adversity experiences may explain the gender differences in the informant-reported pretend play data.

Table 4.13

Percentages (n in parenthesis) of girls and boys reported as not yet showing pretend play, sometimes shows pretend play, or certainly shows pretend play by mothers, fathers, and other family members or friends (converted from mean questionnaire score)

Questionnaire Category	Females	Males
Not yet showing pretend play	7.5 % ($n=8$)	24.8% ($n=34$)
Sometimes shows pretend play	29.9 % ($n=32$)	38 % ($n=52$)
Certainly shows pretend play	62.6% ($n=67$)	37.2% ($n=51$)

4.3.3.2.2 *Associations with chronological age.* There was a small, significant association with chronological age and mean pretend play score across informants, $r(234) = .14, p = .04$.

4.3.4 Is an Absence of Engagement in Pretend Play Between 17 And 24 Months of Age Related to Parents' Concerns about the Child's Developmental Problems

Of the 173 children with pretend play data provided from both informant reports and direct observations, 153 families provided data on later referrals for developmental difficulties. We see that 23 of the 153 toddlers (15%) were classified as displaying no observed pretend play during the direct observations and reported as *not yet* engaging in pretend play by at least one questionnaire informant. Of these 23 toddlers, by 7 years of age, 3 (13 %) had been referred to specialists for investigation for possible developmental difficulties. For the full sample of children in the CCDS with available data on referrals to services (N=251), 19.1% of children had been referred for developmental difficulties by 7 years of age.

4.4 Discussion

4.4.1 Summary of Findings, How They Relate to Other Research, and Future Directions

It appeared that the first displays of pretend play had yet to emerge for some of the toddlers participating in the CCDS toddler assessment. Around 10% of the toddlers aged between 17 and 24 months were reported to have not yet shown pretend play by all questionnaire informants, with a larger proportion reported to have not yet shown pretend play by at least one informant. The proportions of children reported to not yet engage in pretend play are in line with some earlier informant report data from studies with children of similar ages (reported in Chapter 2, e.g., Baron-Cohen et al., 1992; Wong et al., 2004). Reporting informant-rated data on the pretend play capacities of 50 children at a mean age of 18.3

months, ($SD = 1.04$ months, see Chapter 2, p. 106) assessed using the CHAT instrument Baron Cohen and colleagues (1992) reported 14% of the toddlers to not yet “pretend, for example, to make a cup of tea using a toy cup and teapot, or pretend other things?” (p. 842). Similarly, Wong and colleagues 2004 (see Chapter 2, Table 2.4) reported at a mean age of 23.9 months ($SD = 3.9$ months), 12% of the 58 children without developmental delay or autism assessed using the CHAT-23 (Wong et al., 2004, see Table 2.4) were reported to not ever “pretend, for example, to talk on the phone or take care of dolls, or pretend other things” (p. 170).

The use of a multiple method design in the current study, namely the additional direct observations of free play sessions, confirmed that there were some children for whom pretend play displays had not yet emerged. The findings support those from earlier research, indicating that there appears to be some normal variation in the timing of the first appearances of pretend play throughout the second year of life. Chronological age in months was associated with both measures of pretend play in the current study. The findings are in line with researchers who note the emergence of pretend play to be up to 24 months of age (e.g., Ungerer & Sigman, 1981, Cabrera et al., 2017; Wilson et al., 2017). Possibly where some previous observational studies which have noted an earlier general emergence of pretend play, i.e., where displays of pretend play have been universally observed during the second year (e.g., Fenson et al., 1976; Largo & Howard, 1979), the measurement of pretend play may have identified some actions not fully meeting criteria for pretend play or play (see Chapter 2, section 1); in the current study, the development and use of stringent observational definitions for identifying pretend play ensured that only those actions that were accompanied by play signals were measured.

The findings are in line with researchers who suggest developmental assessments of pretend play abilities to be included as part of developmental screening *from* 24 months of

age, but not before (e.g., Barbaro & Dissyanke, 2012). Given that there is some normal variation in the emergence of pretend play up to the beginning of the third year, this suggests caution should be taken before conclusively interpreting a lack of pretend play as an indicator of developmental delay. Importantly, in the current study I found that only 13% of the children aged between 17 and 24 months who did not engage in pretend play (combined data from the two measures of pretend play) were later referred to services for investigation for developmental difficulties, which was lower than the rate of referrals in the rest of the sample. However, to confirm that after 24 months of age is a key time for the near universal emergence of pretend play and support the inclusion of its assessment on developing screening tools at this time point, longitudinal studies are needed to assess ‘change’ in pretend play rates in community samples of children into the third year of life.

While there was statistical agreement across the two measures of pretend play in the current study (i.e., the informant reports and direct observations), which provides a measure of convergent validity for the newly developed pretend play observation coding scheme, the proportion of children displaying pretend play during the observed free play sessions was smaller than the proportion reported to show pretend play by family informants; around a third of toddlers were observed to display pretend play by researchers and around 83% of toddlers reported to show pretend play by informants. The observational definitional criteria were more detailed and stringent for identifying pretend play compared to the wording of the informant-report question; it may be that some informants overestimated pretend play behaviours (Honey, 2007; Inada et al., 2010); however, the use of multiple informants, and the use of mean scores and categorical scores across informants, should negate some of this error. Further, there were very few children who were reported to not yet engage in pretend play by informants who then displayed pretend play during the direct observations; this indicates reliability for the informant report data as a measure of the child’s capacity for

pretend play. Therefore, as the proportion of toddlers *observed* to display pretend play was smaller than those reported to engage in pretend play, the results suggest that a single, short, observation of unstructured free play in the home, and possibly other natural settings, may underestimate children's capacity for displaying pretend play. However, as noted, it should be also be considered that because informants reported on behaviours using less precise and stringent definitions as those used in the observational study, there may be an overestimation of pretend play rates from the informants' reports.

The findings supports ideas set forth by previous authors who have suggested that free play sessions may not be fully adequate for identifying children's optimal pretend play competence (see Chapter 2, p. 49; Belsky, Garduque & Hrncir, 1984; Vondra & Belsky, 1991) and also supports earlier research that found that it was more typical for a limited range of play skills to be shown by two year old children during *unstructured* free play sessions (Kelly-Vance et al., 2002). Frahsek and colleagues (2010; see Chapter 2, section 2.2.6) similarly found that the rates of pretend play observed during a semi-structured play scenario with 24-month old children correlated with parent reports of pretend play, but also reported lower percentages of children passing the researcher-observed instructed pretend play items than the percentage of children reported to display pretend play by parents (although the finding was not evident with 30-month-old children). Whether this underestimation of pretend play capacity during observed sessions extends to free play sessions in a laboratory with more standardised toys and environment, or more structured sessions in the home (e.g., restricted to only free play in one room and restricted to one set of researcher provided toys) needs further investigation in future studies using mixed methods of data collection with representative community samples of children.

With regards to the children who did display pretend play during the unstructured free play sessions, we may be seeing a group of children who had more propensity, preference or

motivation to engage in pretend play as opposed to other play activities (see Singer, 1973). While the children were free to interact with the toy kitchen set, build with the wooden shape sorter blocks, bounce on their own trampoline in the garden, or engage in many other activities within the home, it appears that possibly some children ‘chose’ to orient towards engagement in pretend play. The individual differences in displaying pretend play during the free play sessions were unrelated to the child’s gender or their exposure to social adversity; rather, these individual differences may possibly reflect a propensity, preference or motivation to engage in pretend play (Singer, 1973; Vondra & Belsky, 1991). Future studies using longitudinal research designs should investigate if individual differences in children’s displays of pretend play are stable over time to further explore the notion of a possible propensity towards pretend play ‘trait’ (Bornstein, Putnick, & Esposito, 2017).

Chronological age was associated with pretend play observed by researchers in the home environment; this likely reflects that the child inevitably first needs to possess competence for pretend play to subsequently perform/ ‘choose’ to use it in free play (Vondra & Belsky, 1991). Thus some of the younger children may not have developed the competence for pretend play to then be able to ‘choose’ to display pretend play.

The use of a community sample permitted investigation into the impact of family circumstances on pretend play; as noted, individual differences in displaying any pretend play enactments during the observed home visits were not related to the exposure to family risk factors for sociodemographic adversity. However, exposure to sociodemographic adversity was associated with children’s reported capacity for pretend play; children exposed to higher levels of sociodemographic adversity had lower mean pretend play scores across informants, and children categorised as not yet showing pretend play using the informant-reported pretend play scores had higher exposure to sociodemographic adversity. It appears that there may be a delay in the emergence of pretend play for some children exposed to more

sociodemographic adversity. As sociodemographic family factors were associated with early pretend play capacities (as reported by informants) in the current study, this possibly suggests issues with generalising from previous studies of early pretend play capacities carried out with only small scale samples of non-diverse, solely middle-class socioeconomic participants.

If the observational data do pick up individual differences in motivation/ propensity/ preference to engage in pretend play, this possibly suggests that increased exposure to social adversity is associated with the timing of pretend play, but is not associated with subsequent performance of pretend play. The sociodemographic adversity scores were not significantly different for children reported to sometimes or certainly show pretend play by informants'; this finding confirms that exposure to social adversity was not associated with pretend play performance but possibly more with pretend play emergence. The exposure to sociodemographic adversity measure included data on socioeconomic variables, i.e., mothers' social class status; previous authors have noted that factors such as the availability of toys, overcrowding, or parental attitudes towards play (e.g., Fein, 1981; Trawick-Smith et al., 2015; Barreto et al., 2017) may underlie any social class differences in pretend play previously found in the literature. Future work could combine the mixed method measures used in the current study with a survey of available toys and conditions in the home environment, and additional questions to parents about attitudes towards encouraging pretend play, to understand this association with reported pretend play and exposure to sociodemographic adversity further. As McLoyd (1986) noted, "social class is an umbrella variable which should serve only as a conceptual way station on the road to identifying more proximate variables which cause or underlie the observed differences" (p. 182). Thus the variables possibly underlying the possible association with sociodemographic adversity and the emergence of pretend play need further investigation.

4.4.2 Limitations

There are many limitations to the current study, which derive partly from the Cardiff Child Development Study not being specifically designed for investigation of children's pretend play. The informant-reported pretend play data was based on just one question about the children's pretend play; in future work, informants could also report qualitative information about the types of pretend play observed, which could be used to assess the validity of the measure. However, it is noteworthy that most developmental screening instruments that include informant rated assessments of children's pretend play also contain just one question about children's pretend play abilities (e.g., the CHAT, Baron-Cohen et al., 1992; the M-CHAT, Robins et al., 2001); therefore, the data in the current study are in line with such measures. Further, the current study had the benefit of multiple informants, absent from most previous studies that have included informant-report data on early pretend play.

There was variation across the twenty-minute unstructured free play sessions which could limit comparisons across the participants. For example, some children went outside, some children turned the television on, and some children played with the toys provided by the researchers; some children interacted with a 'friend' of a similar age, while some interacted with other family members, e.g., a cousin. There was variation across participants with regard to the age gap between the focal child and the peer present during the observations; previous studies have reported that the age gap between play partners relates significantly to the frequency of different types of pretend play children display (e.g., Youngblade & Dunn, 1995). Furthermore, joint pretend play between siblings has been shown to be more frequent when the quality of the relationship between the play partners is rated as *very friendly*, compared to *somewhat friendly* or *unfriendly* (Dunn & Dale, 1983). These factors were not measured, or controlled for, in the current study and it may be that some of the variation in pretend play could be attributed to these factors. However, such

variation in the sessions that arose from the parents' choices provides more natural levels of play in the home environment and more "ecologically valid samples of behaviour" (Bornstein, Vibbert, Tal, & O'Donnell, 1992, p. 326). For example, the child present at the session may reflect the child usually interacted with; the child 'choosing' to watch television, or venture outside, may reflect their preferred activity and reflect their 'typical' behaviours. Further, in early years settings in the United Kingdom, when early years practitioners carry out observation of children's behaviours to inform assessments of the child's development (see Chapter 1), the observer often follows the child as they move freely around the setting; possibly from the role play area, to the book corner, to the outdoor toys. Therefore, the observations in the current study are in line with such early education contexts. However, possibly if children were observed for an hour of more, we would have seen an increase in displays of pretend play more in line with the proportions of children the informants reported to have the capacity to pretend.

The observations of free play took place at varying times during the day, this could also limit comparisons across participants. It may be that some of the variance in engagement in pretend play, or in the frequency of pretend play shown, relates to the time of the day the toddler was observed. A toddler experiencing tiredness because they were observed before a nap, or a toddler experiencing hunger because they were observed before a mealtime, may show different engagement in pretend play compared to a child recently fed and napped; possibly a hungry child may be more concerned with alerting parents that they want food, rather than engaging in pretend play, conversely, it may be that a hungry child shows an increased interest with play food and kitchen equipment thus leading to increased pretend play. Future work could try to minimise this measurement issue by ensuring that observations occur at the same time of day for all families, e.g., after lunch time; however, it should be noted that in the current study, providing families with a range of possible visit times likely

ensured that more families participated in the home visits compared to the use of a more controlled time of observation. Studying a larger sample of children than many of the earlier observational studies on pretend play was a key aim of the current study.

The subsample of children and families from the Cardiff Child Development Study assessed in the peer visit procedure significantly differed on the social adversity variable from the sample of participants originally recruited to take part in the Cardiff Child Development Study during pregnancy. Nonetheless, the relatively large community sample studied in the current study is still larger and more diverse than many earlier observational studies on the rates of pretend play in the toddler years and, within the more restricted range, social adversity still influenced pretend play.

4.4.3 Conclusion

The current study used a mixed method design (direct observation of unstructured free play sessions combined with informant report questionnaire data) that was largely absent from the literature base on the emergence of pretend play. Further, the study used data derived from a relatively large, nationally representative, community sample of children from the UK; previous observational studies investigating children's pretend play during the first two years of life have often been conducted with smaller, less diverse, samples of children. It was found that at the age (17 to 24 months) when some researchers have previously argued pretend play capacities to be emerging, or to have emerged by, that there were still individual differences and not all children displayed, or were reported to, engage in pretend play. This has relevance to the measurement of children's pretend play abilities on developmental screening instruments for delays and disorders during the second year of life. Furthermore, while there was statistical agreement between the informant report and direct observation measures of toddlers' pretend play, which provided a measure of convergent validity for the newly developed observational coding scheme, it appears that a single, short, observation of

unstructured free play in the home environment might underestimate children's capacity for pretend play. This has relevance to the methods used to assess children's pretend play capacities in both clinical and early education settings.

Chapter 5

Study 2

A Longitudinal Analysis of Children's Pretend Play from Infancy to Early Childhood:

Consistency and Change

5.1 Introduction

In Study 1 (Chapter 4), I explored children's displays of pretend play during a time period previously noted as important for the emergence of pretend play (i.e., between 17 and 24 months of age). The study advanced on previous research by exploring questions on the emergence of pretend play in a community sample of children and by using a mixed method approach. I found that not all children taking part in the CCDS displayed, or were reported to, engage in pretend play during/by this toddler period. The results are in line with the findings from the review of the literature I presented in Chapter 2. It appears that between the ages of 17- and 24-months, engagement in pretend play has yet to emerge for some children; there appears some normal variation in the emergence of pretend play across the toddler period. However, furthering our understanding about the emergence of pretend play requires longitudinal investigation which has been lacking in the topic area.

To investigate whether there is a move towards almost universal emergence of pretend play after 24 months of age, longitudinal studies are needed to assess 'change' in pretend play rates in community samples of children into the third year of life. Furthermore, while some children appear to not yet engage in pretend play by 17 to 24 months of age, do other children show pretend play much earlier in development, in infancy? These questions have not yet been examined using longitudinal studies of representative community samples

of children from the UK, studied from infancy into early childhood. Study 2 aimed to address this gap in the literature. Study 1 had highlighted that while the children observed during the free play sessions in their homes in toddlerhood were free to interact with the toy kitchen set, build with the wooden shape sorter blocks, bounce on their own trampoline in the garden, or engage in many other activities within the home, it appeared that possibly some children ‘chose’ to orient towards engagement in pretend play; it may be that these individual differences possibly reflect a propensity, preference or motivation to engage in pretend play (Singer, 1973; Vondra & Belsky, 1991). Can such individual differences also be identified even earlier in development?

Longitudinal research designs, rather than single time point observations, are required to investigate if individual differences in children’s displays of pretend play are stable over time to explore the notion of a possible propensity towards pretend play ‘trait’ (Bornstein, Putnick, & Esposito, 2017). Study 2 aimed to use further existing data from the CCDS to conduct a longitudinal analysis of children’s pretend play across the first three years of life, to examine further fundamental questions around the emergence and development of children’s pretend play, including exploration of change and the stability of individual differences in displays of pretend play over time.

The CCDS design (see Chapter 3) consisted of six waves of longitudinal data collection, following a pattern of alternating home and laboratory visits. The findings reported in Study 1 derived from the home visits conducted during Wave 4 of the CCDS (i.e., the Toddler Assessment). To reduce error variability in longitudinal studies, it is important that conditions during the observations are as similar as possible at each time point, for example, that observations are all conducted at the same time of day and within the same setting (Cook & Ware, 1983). While the free play sessions observed for pretend play in Study 1 (Wave 4 of the CCDS) took place in the families’ homes, with children observed naturally

with a familiar peer as they moved freely around their home and interacted with their own toys (and also some toys provided by the study team, e.g., the toy kitchen set), the ‘waves’ of data collection that preceded, and followed, the home visit both took place in the university laboratory. At both laboratory visits, conducted during infancy (Wave 3) and early childhood (Wave 5), children (and parents) participated in 20-minute free play sessions with unfamiliar peers, as part of a simulated birthday party scenario, where the families were left alone in a laboratory room in the university (decorated to look like a birthday party room) and instructed to behave as they normally would at a children’s party (See Chapter 3 for further procedural details).

If longitudinal analysis were to be conducted on displays of pretend play observed during the free play sessions across the three waves of data collection, any variability in children’s pretend play across the three different time points (i.e., Waves 3, 4 and 5) could simply be attributed to the different situational factors, rather than changes in pretend play across time; the marked differences in the home and laboratory free play observations would likely introduce error variability into any longitudinal analysis of change and consistency of pretend play behaviours over time. In contrast, the laboratory visits conducted during the infancy and early childhood periods (the *Infancy* and *Early Childhood Parties*) were identical in terms of the procedures, timing of the sessions (all conducted between 2 and 4 pm and all free play sessions scheduled to last for 20 minutes), environment, toys (identical toy picnic set¹², and other toys, see p. 205 and p. 207; however, there were some toy changes to ensure the toys were developmentally appropriate at each wave) and instructions provided (see Chapter 3 for further procedural details); this permits longitudinal investigation of children’s displays of pretend play observed during the free play sessions in the laboratory.

¹² The picnic set included a teapot; cups; bowls; plastic food; plates and a picnic mat.

Consequently, Study 2 comprised a longitudinal analysis of change and consistency in children's displays of pretend play from infancy to early childhood.

5.1.1 Consistency and Change

In developmental science, longitudinal studies permit the study of both consistency and change over time, for groups and individuals. For the current investigation, I drew upon a conceptual framework introduced by Bornstein, Putnick, and Esposito (2017) for the terms used to describe consistency and change. In some ways, this framework defines terms differently to other literature on developmental change; however, I used this framework because it has been applied in previous longitudinal studies of developmental change in children's pretend play (e.g., Kwak, Putnick, & Bornstein, 2008).

The tracking of consistency and change can be in terms of "group mean-level consistency or change" (Bornstein et al., 2017, p. 1). The group mean-level of a characteristic can show *continuity* (consistency) or *discontinuity* (change) through time, with a *continuous characteristic* being "one that a group displays at the same mean level over time" (Bornstein et al., 2017, p. 2) and a *discontinuous characteristic* "one that the group either increases or decreases in mean level over time" (Bornstein et al., 2017, p. 2). For example, researchers could track a group of children's mean frequency of pretend play acts over time; if the group of children's mean frequency of pretend play acts increases significantly from the first to the second time point, in Bornstein's terminology, the frequency of pretend play would be said to show *discontinuity* through time, i.e., quantitative, statistically significant change in the mean frequency of pretend play across the period investigated (Bornstein et al., 2017).

While Bornstein and colleagues use the term *discontinuity* to refer to a quantitative change in the group mean-level of a characteristic measured using the same metric over time (i.e., a statistically significant increase or decrease in the mean-level of a group over time)

and *continuity* as describing where the group mean-level of a characteristic remains statistically the same over the time period investigated (i.e., no statistically significant change), it is important to note that there is some ambiguity and disagreement in how other researchers define and conceptualise these terms (Schulenberg, Maggs, & O'Malley, 2003). Some developmental psychologists instead use the terms to describe the processes and factors that underlie developmental change. For example, developmental change can be said to be either “stage-like” and *discontinuous* (Lourenço, 2016), involving underlying structural change and the emergence of new structures (Schulenberg et al., 2003), or alternatively, as gradual, cumulative and *continuous* change (Lourenço, 2016). Bornstein and colleagues, in introducing the terms as defined above, similarly discussed ambiguities in the use of the terms across researchers. In contrast to their “quantitative” use of the terms, Bornstein et al., note that “some developmentalists refer to qualitative changes in ontogeny (e.g., moving from gestures to spoken communication) as ‘discontinuous’ as well” (p. 2). For further discussion of ambiguities around the terms (*continuity; discontinuity*), readers should refer to Schulenberg and colleagues (2003) for an interesting discussion. As noted, for the purposes of the current body of work, I used the terms as conceptualised by Bornstein and colleagues because this conceptualisation has been used in earlier longitudinal studies of developmental change in children’s pretend play (e.g., Kwak et al., 2008), and therefore permits direct comparison across studies.

Kwak and colleagues observed children during free play at 13 and 20 months of age; children’s mean frequency and duration of pretend play was found to increase significantly across time, with the authors describing pretend (symbolic) play as showing “developmental discontinuity” (p. 9) from 13 to 20 months of age, and describing play as being a “discontinuous” characteristic (p. 4). As the current study (Study 2) was concerned with investigating, mapping and describing development change in a group of children’s pretend

play quantitatively from infancy to early childhood, while also looking at the relative stability of individuals within the group (i.e., the stability of relative standing of individuals in the group; *stability* is defined in further detail below), Bornstein's terminology in describing quantitative developmental change of the mean-level of the group (i.e., the group being the full sample of children at each developmental time point) was adopted. Such quantitative description is needed because there is a lack of previous longitudinal work tracking developmental change in pretend play from infancy to early childhood.

As mentioned, along with identifying developmental change, I also aimed to explore the relative stability of individual standing within the group; exploring whether alongside any developmental change in group mean-levels of pretend play, does an individual's rank order in the group remain the same (i.e., is there stability of individual differences across time)? Bornstein and colleagues' approach focuses on exploring group mean-level developmental change, while simultaneously examining the stability of the rank order of individuals within the group; this fitted the aims of the current research and therefore this approach was adopted in Study 2.

Longitudinal studies permit researchers to track "individual-order consistency or change" (Bornstein et al., 2017, p. 1). An individual's "relative order, standing, or rank... in a group on a characteristic" can show *stability* (consistency) or *instability* (change) through time (Bornstein et al., 2017, p. 2). A stable characteristic would be "one that some individuals display at high levels relative to others in a group at one point in time and again display at relatively high levels at a later point in time" (Bornstein et al., 2017, p. 2); for example, children's relative frequency of pretend play acts, or their ordinal level of play derived from a developmental play scale.

Investigating the stability of individual differences over time paints a picture of development and can indicate if a characteristic is a state or trait (Bornstein et al., 2017) and additionally be used to assess the construct validity of measures; “if two tests are presumed to measure the same construct, a correlation between them is predicted” (Cronbach & Meehl, 1955, p. 8). If individual differences in displays of pretend play at one time point correlate with (and predict) individual differences in children’s later displays of pretend play, both observations (both “tests”) may be seen as measures of the same psychological construct (Cronbach & Meehl, 1955). Thus, investigating both *continuity* (*v. discontinuity*) at the level of the group and *stability* (*v. instability*) at the level of the individual is important for a complete picture of developmental patterns (Bornstein et al., 2017). It is important to investigate both change in group mean levels of a behaviour and the stability of individual differences concurrently, in order to understand developmental trends and variation around these trends. The overarching aim of the current study was to investigate consistency and change, at the level of the group and the individual, in children’s displays of pretend play from infancy to early childhood (around the time of the first birthday to around three years of age).

5.1.2 Displays of Pretend Play around the Time of the First Birthday

An analysis of both *group continuity* and *individual stability* requires that some children can show the behaviour under investigation at the first time point in a study, i.e., that some children can show pretend play when the study begins. While studies report differing ages for the first appearances of pretend play, earlier research has shown that some infants can engage in pretend play (as defined in this thesis) around the time of their first birthday. For example, Lowe (1975) conducted a cross-sectional study of 244 children aged 12 to 36 months in which the child was left to play spontaneously with toys (including a spoon, cup and doll); 63 % of 12-month-olds engaged in pretend self-feeding or drinking. In further cross-sectional

work with 57 infants aged 7 to 20 months, observed during an individual free play session with a tea set, 77 % of 13-month-olds performed “symbolic” acts (e.g., pretend eating; pouring; drinking) (Fenson et al., 1976). Other authors have similarly noted children to show pretend play between 12 to 16 months of age (e.g., Largo & Howard, 1979; Belsky & Most, 1981; Palacios et al., 2016).

Some researchers have also shown that pretend play can appear even earlier in development. In a microgenetic longitudinal study in which ten children were followed from 8/10 to 24 months (McCune, 1995), the criterion of exaggerated actions or sound effects was used to identify pretend behaviours during observation of the infants’ free play with a range of toys (dolls, bricks, cups, etc.). McCune recorded the earliest possible self-directed pretend act at 10 months, with onset varying from 10 to 17 months. However, in a parallel cross-sectional sample McCune (1995) reported no displays of self-directed pretend play by children younger than 12 months. One child displayed a self-pretend act at 12 months, while 67% did so at 13 months.

Other researchers have similarly noted displays of pretend play earlier than the first birthday, between 8 and 10 months of age (e.g., Morrissey, 2014; Orr & Geva, 2015). Fenson and colleagues (1976) and Largo and Howard (1979) both reported displays of pretend play at 9 months of age (termed *symbolic* and *representational* play respectively); however, only one child in each study displayed the behaviour. Conversely, other investigators have noted pretend play (as defined in this thesis) to appear much later, from 17 to 18 months of age onwards (Westby, 1991; Gaskins, 2000; Nielsen & Dissanayake, 2004; Westby & Robinson, 2014).

Those studies that have reported infants less than 12 months of age displaying pretend play may have potentially included “false positives” (McCune, 1995, p. 202) during coding

of early pretend play. For example, Orr and Geva's (2015) observational coding scheme included the symbolic play category of *Single-object play*: "single pretend action that is directed deliberately toward himself or herself or toward the mother"... such as placing a bowl on his or her head or putting a stick next to his or her ear as a telephone" (p. 150 - 151). It may be that such actions are simply exploratory behaviours, rather than pretend play. The shape of a bowl *affords* placement on a head; therefore, without added behavioural evidence, we cannot rule out this behaviour as form of exploration (see Chapter 2, section 2.1.1, for further discussion on this issue). Consequently, there may be an overestimation of the number of children displaying pretend (symbolic) play. It is important to use observational coding schemes that exclude actions that are simply exploring different possible actions on objects.

The differences in findings across studies are also likely concerned with the paradigms used to investigate pretend play and the samples of children studied. In terms of the different paradigms used, it is possible that pretend play would not appear until later time points if researchers use tasks that require receptive language to understand a tester's instructions for the measurement of pretend play (e.g., Nielsen & Dissanayake, 2004), as opposed to the methods with fewer receptive language requirements, such as observations of play sessions in the home with standard toys and the child's mother (e.g., McCune, 1995).

In terms of the samples of children studied, Morrissey (2014) studied middle-class children with "average- to high-ability" (p. 195) and Gaskin's (2000) research focused on children from a Mayan village; these sample differences may account for the different reported ages of pretend play appearances. The age of onset of pretend play (17 to 19 months) reported by Westby (1991) was defined as the age when 80% of the sample showed a form of pretend behaviour (in this case *single pretend actions*, or *auto-symbolic* play, e.g., *pretends to drink from an empty cup*); however, in the text of the article, Westby noted that many middle-class children in the sample showed the behaviours at younger ages. However,

while sample differences may explain some of the disparities with the reported ages for children showing pretend play, individual differences have also been documented *within* studies of mostly middle class children, regarding the age of onset of pretend play in general and onset of different types of pretend play (e.g., Shimada, Kai & Sano, 1981; Belsky & Most, 1981; Ogura, 1991; Tamis-LeMonda & Bornstein, 1991; McCune, 1995).

Many of the studies that identified displays of pretend play at around one year of age are based on small samples of middle-class children. The first aim of the present study was to investigate if pretend play would be displayed at all during the first longitudinal assessment point, in the infancy period, and if so, what proportion of infants would display pretend play in a larger, more representative sample than many of the earlier studies on infant pretend play.

5.1.3 Displays of Pretend Play in Early Childhood

Longitudinal analyses investigating change and stability over time must take into account floor and ceiling effects at the two time points. Stability cannot be demonstrated if a characteristic shows variation at an early point but is at ceiling capacity at a later time point (Fenson, 1978); for example, if all children reach the highest ordinal level on a play scale (e.g., engaging in pretend play) by the later time point when testing takes place (e.g., Fenson, 1978).

Earlier observational studies investigating the pretend play of children aged between 2.5 and 3 years of age report that 100% of children displayed at least one pretend enactment in free play sessions, across laboratory, home and childcare centre settings, with observation times varying from three minutes upwards (Fenson, 1984; Shimado & Sano, 1984; Howes, 1985; Haight, Wang, Fung, Williams, & Mintz, 1999; Brown et al., 2001). Around the beginning of early childhood, children appear at ceiling capacity for engaging in at least one

enactment of pretend play; it appears that the capacity to engage in pretend play has emerged for most children around the middle of the third year and beyond. However, while earlier findings are fairly consistent on the proportion of children that display pretend play during free play sessions around the third year, there is little research with community samples, and not much longitudinal research exploring developmental change in displays of pretend play from infancy to early childhood. Therefore, the second aim of the current study was to investigate in a community sample how the proportion of children engaging in pretend play at the second longitudinal time point, in early childhood, changed from the infancy period; were displays of pretend play shown by the vast majority of children in the early childhood period? If there can be variation in achievements at the first time point in a study (i.e. some children display pretend play, some children do not), but no variation at the second time point in a study (because all children are at ceiling for showing the type of behaviour), evidence for stability would not be found (Fenson, 1978). Therefore, before testing for stability of individual differences, it is important to determine whether there are meaningful individual differences at each time point with respect to different features of pretend play.

5.1.4 Longitudinal Research on Consistency and Change in Children's Pretend Play from One to Three Years

There is relatively little longitudinal research reporting on both continuity/discontinuity at the level of the group and stability/instability of individual differences in children's displays of pretend play across the period from one to three years of age. Most previous longitudinal research investigating both developmental change in the group and the stability of individual differences in displays of pretend play has focused on shorter periods of development of around one year or under (e.g., Russell & Russnaik, 1981; Bretherton, O'Connell, Shore & Bates, 1984; Tamis-LeMonda & Bornstein, 1991; Bornstein et al., 1992; Malone, 1997; Orr & Geva, 2015; Neilsen & Dissyanke, 2004; Kwak et al., 2008).

Where studies have investigated individual stability across longer periods, most have either focused on the more social aspects of play and pretend play (Howes, Rubin, Ross & French, 1988; Howes & Matheson, 1992), or only small numbers of children have been studied (e.g., Haight & Miller, 1993); with the N less than recommended by some researchers for performing correlational analyses (i.e., David, 1938, recommended $N = \geq 25$) the studies lack the statistical power to investigate stability over time. Further, there is an absence of longitudinal research across this period (one to three years of age) within representative community samples of children. The overarching aim of this study is to address this gap in the literature.

I identified only two earlier longitudinal studies with samples that followed 25 children or more that investigated both change and consistency (in the group mean and individual differences) in pretend play from around the time of the first birthday to around three years of age: Russell (1981) and Zerwas (2003). Both studies investigated change and consistency in the frequency and complexity of children's pretend play shown during free play sessions¹³. As noted by the author of one of these studies, Zerwas (2003), "little is known about whether individual differences in frequency and complexity are stable over age" (p. 2).

In the earlier of the two longitudinal studies, Russell (1981) investigated the pretend play actions of 25 first born children from two-parent, middle and lower class, families at three time points (mean ages: 12.68 months; 20.48 months; 34.45 months). The author observed pretend play behaviours during 15-minute free play sessions in the laboratory, with the child's mother present and the mother playing as she normally would. Russell calculated the frequency of *all* instances of *symbolic play*, with symbolic play enactments ranging in

¹³ The authors investigated other change and consistency variables, but frequency and complexity were consistent across the studies.

complexity from “pushing a car and making an engine noise” to “verbal substitutions” (p. 99).

The more recent of the two studies (Zerwas, 2003), an unpublished study conducted as part of the authors Master of Science degree, followed 655 infants from 15 to 24 to 36 months of age. The study included two sub-samples of children from the NICHD Study of Early Child Care; the sub-samples were noted by Zerwas as “more likely to have finished high school”; “more likely to come from two parent families”; “with a higher income-to-needs ratio” (p. 8) than the original, more nationally representative, sample. Like Russell (1981), Zerwas observed pretend play behaviours ranging in complexity from “drinking from an empty cup” to “double substitution” (p. 11) during 15-minute free play sessions in the laboratory. The author also combined the frequency of *all* pretend play actions to create a *total pretend play score*. In contrast to Russell’s paradigm, Zerwas observed the child playing alone (although the mother was in the testing room).

In terms of the observed frequency of children’s pretend play, which has been noted to be a “good index of performance” (Rutherford et al., 2007 p. 1029), the two studies I identified both reported longitudinal increases (change) in the group mean frequencies of overall pretend play enactments shown during the 15 minute free play observations in the laboratory from the beginning of the second year (12 to 15 months) into the end of the third year (34 to 36 months) (Russell, 1981; Zerwas, 2003), see Table 5.1.

Table 5.1

Mean observed frequencies of pretend play actions in the studies conducted by Russell (1981) and Zerwas (2003) (SD in brackets)

	Longitudinal time point and mean frequency of actions	
	Beginning of the second year	End of the third year
Russell (1981)	2.3 (2.3)	6.2 (4.1)
Zerwas (2003)	6.2 (5.7)	12.3 (8.5)

The picture on the stability of the individual differences in pretend play shown across these studies is less clear. Zerwas (2003) reported significant correlations between the frequency of pretend play acts at 15 and 36 months, while Russell (1981) reported non-significant correlations for frequency of pretend play acts at Time 1 (12 to 14 months) and Time 3 (33 to 39 months). The different findings are likely to reflect the fact that Zerwas studied a larger group of children ($N=665$) than Russell did ($N=25$); thus, Zerwas had increased statistical power to find associations over time. However, it could also be that the children in Russell's study were younger, and stability of individual differences, if it occurs, may not begin until towards the middle of the second year.

The findings from the few studies that I located indicate that, at the group mean level, the frequency of children's pretend play shows change across time (i.e., significantly increases) and therefore shows *discontinuity* in development from one to three years. In terms of consistency and change in individual differences, whether children's relative frequency of pretend play acts around one year of age shows *stability* in development to around three years of age is unclear; earlier findings are inconsistent.

Although Zerwas studied a large sample of children ($N=665$) and there was some variation across the sample in terms of family background (families from the United States), previous longitudinal work had not been carried out with representative community samples of children; further work is needed that explores continuity and stability with community samples of children representative of general populations, such as the general UK population. Zerwas (2003) followed children from 15 months of age; however, it is important to study continuity and stability from the first appearances of pretend play. As discussed above, twelve months of age, and younger, has been noted previously by some authors for the age of onset of pretend play (Belsky & Most, 1981; Fein, 1981; Morrissey, 2014; Orr & Geva, 2015).

While the longitudinal studies mentioned above additionally explored continuity and stability in terms of play complexity and developmental play level (e.g., advancing from single self-directed pretend play actions to double object substitutions), it has been suggested that free play sessions may not be suitable for measurement of optimal pretend play competence, in terms of competency for showing different types of pretend play (Belsky, Garduque & Hrnčir, 1984; Vondra & Belsky, 1991). Supporting this, Kelly-Vance and colleagues (2002) found that, in free play sessions, it appeared more common for children at 2 and 3 ½ years of age to demonstrate limited types of play (only a few instances of *object substitutions* were displayed and there was an absence of *inventive acts*); however, the children likely had the capacity to engage in the different types of play. Consequently, as the current study observed pretend play during free play sessions, the third aim was to investigate change and consistency in the overall frequency count of children's pretend play, but not in developmental pretend play level (aside from investigating change and consistency from the development achievement level of simply showing any pretend play).

5.1.5 Construct Validity of Pretend Play Measured in Infancy and Early Childhood

As noted, investigating stability of individual differences is important for understanding if a characteristic is a state or trait (Bornstein et al., 2017). If stability in frequency of pretend play is observed, this may reflect stable individual differences in children's preference, enjoyment, or tendency to engage in pretend play activities; frequency counts have been noted to partly reflect children's motivation to perform pretend play (Rutherford et al., 2007) and possibly children's motivation is a stable trait (Vondra & Belsky, 1991). Singer (1973) had pondered whether, alongside developmental trends in pretend play development, there are "specific children who show a predominance of imaginative play at very early age and persist in this pattern through adolescence?" (p. 49). To test this, it is important to investigate both change in group mean levels of pretend play and the stability of individual differences concurrently, in order to understand developmental trends and variation around these trends. Bornstein and colleagues' approach to analysing change and consistency in longitudinal data sets is useful for such investigation.

Related to Singer's speculation, researchers have since classified children as either high or low in what is termed Fantasy Orientation (FO); with High FO children, compared to Low FO children, noted to create more imaginary companions and engage in more pretend play (Pierucci, O'Brien, McInnis, Gilpin & Barber, 2014). It is suggested that Fantasy Orientation may be a stable individual trait lasting through childhood, and maybe further (Woolley, 1997); however, as the research has often used child interviews as a method of data collection (to gain data on imaginary companions), the topic area has focused on children aged 3 years of age upwards (Pierucci, et al., 2014). If stability across time is shown in the current study, this may indicate that a child's orientation towards fantasy and imaginative activities might be found earlier in development; it may be that some infants show an early preference for pretend play (in terms of showing any and showing more

frequent pretend play) and this remains stable in the form of showing a higher relative frequency of pretend play at later time points in development.

Some earlier work with infants supports this notion of an early, stable preference for pretend play activities. Acredolo, Goodwyn, and Fulmer (1995) followed 92 children from 11 months to four years and found that children recorded as having an imaginary friend at the later time point spent significantly more time playing with toys coded as more affording of pretend play at 11 months (during a solitary free play task), compared to children reported to have no imaginary friend at four years old. However, the authors did not measure levels of pretend play, simply duration of play with toys “affording pretend play” (p. 2).

Wolf and Grollman (1982) followed four children longitudinally from the ages of 1 ½ until 4 ½ years old and suggested that over time there was consistency in certain children showing more skill and/or interest in sociodramatic play than others. However, as only four children were followed, generalising from this study is limited.

An alternative explanation, if stability in individual order is observed over time, is that showing any pretend play (or a relatively high frequency of pretend play) in infancy demonstrates an early competency for pretend play, and that those children who achieve this competency at this young age then maintain this advanced competency at the later time point, i.e., by showing a relatively higher frequency of pretend play the second time point. Any stability, if found, may be attributable to individual differences in developmental timing, or maturation, in achieving these competencies. This explanation may be supported if, as the other longitudinal studies showed, children’s mean frequency of pretend play acts is observed to increase significantly over time; increasing frequency of pretend play may be a marker of increasing competence, maturity and sophistication.

However, this second explanation lacks support, as researchers have previously noted that frequency counts are inadequate for measuring pretend play competence and rather consider frequency counts to be useful for measuring pretend play performance, enjoyment, and more motivational individual differences (Rutherford et al., 2007). Further, previous research has shown that, from around the end of the second year into the middle (and end) of the third year, there appears little change in the frequency of pretend acts (Largo & Howard, 1979; Russell, 1981) or even a decrease in frequency (Zerwas, 2003). These findings indicate that in early childhood, frequency counts are not a good measure of play sophistication, competency, or cognitive maturity. However, to test whether frequency of pretend play appears to be a marker of increasing maturity during early childhood, a further aim of the study was to assess whether infants' specific chronological age in months at each longitudinal time point was associated with a higher frequency of pretend play; if increasing frequency of pretend play is a marker of increasing pretend play competence and maturity in infancy and early childhood, it would be expected that pretend play frequencies would increase longitudinally over time, but additionally the older children at *each* time point would also display higher frequencies of pretend play. Conversely, if the older children at *each* time point do *not* display higher frequencies of pretend play, this would possibly provide support to the notion that frequency counts observed during free play sessions in the laboratory are inadequate for measuring increasing pretend play competence and maturity at that specific point in development.

The use of a community sample also allowed investigation in to whether any observed individual differences were related to sample characteristics such as social adversity, including social class status and gender. These factors might explain any observed stability in individual differences over time.

5.1.6 Research Questions

Data from the Infancy and Early Childhood Parties conducted as part of the Cardiff Child Development Study (see Chapter 3) were used to investigate change and consistency in displays of pretend play from around one year to around three years of age. The study investigated five research questions:

- (1) Do any infants display pretend play at the Infancy Party?
- (2) Does pretend play change over time? This question was answered in two parts:
 - a. Does the proportion of children engaging in pretend play change from infancy to early childhood?
 - b. Does the frequency of pretend play change from infancy to early childhood?
- (3) Are individual differences in the frequency of pretend play stable (consistent) over time?
- (4) Are individual differences in displays of pretend play associated with sociodemographic adversity or gender at either time point?
- (5) Is frequency of pretend play associated with chronological age in months at each time point?

Investigation of such questions has been part of earlier studies; however, the current study adds to the evidence base by analysing data from a representative community sample of children from the UK studied longitudinally from infancy to early childhood.

5.2 Method

5.2.1 Participants

The analyses reported in this chapter derive from children taking part in the 20-minute free play sessions that occurred during the Infancy (Wave 3) and Early Childhood (Wave 5) birthday parties conducted as part of the Cardiff Child Development Study (CCDS). A description of the CCDS study design and general procedures for Wave 3 and Wave 5 was presented in Chapter 3, along with information about the participants who took part in the CCDS study.

5.2.1.1 Wave 3 Infancy Party. Two hundred and fifty-two infants from the original CCDS sample were assessed for pretend play during the free play session at the Infancy Party. Figure 5.1 (left arm of the flowchart) shows the progression of the sample from recruitment in pregnancy to the infants that were observed for early pretend play. The mean age of the infants observed for pretend play was 12.8 months ($SD = 1.10$). The participants' demographic characteristics did not differ significantly from the original sample (See Table 5.2).

5.2.1.2 Wave 5 Early Childhood Party. The participants focused on in this study are the 197 children who participated in the free play session at the Early Childhood party (Wave 5), and had earlier also been assessed for pretend play at the Infancy party (Wave 3). Figure 5.1 (right arm of the flowchart) shows the progression of the sample from recruitment in pregnancy to the children that were observed for pretend play in early childhood and then formed the group of children used in the subsequent longitudinal analyses (See Figure 5.1). The mean age of the children observed for pretend play in early childhood was 33.6 months ($SD = 2.47$). The families of the 197 children had significantly lower adversity scores,

compared to the original sample (See Table 5.2); however, the gender of the children did not differ significantly from the original sample.

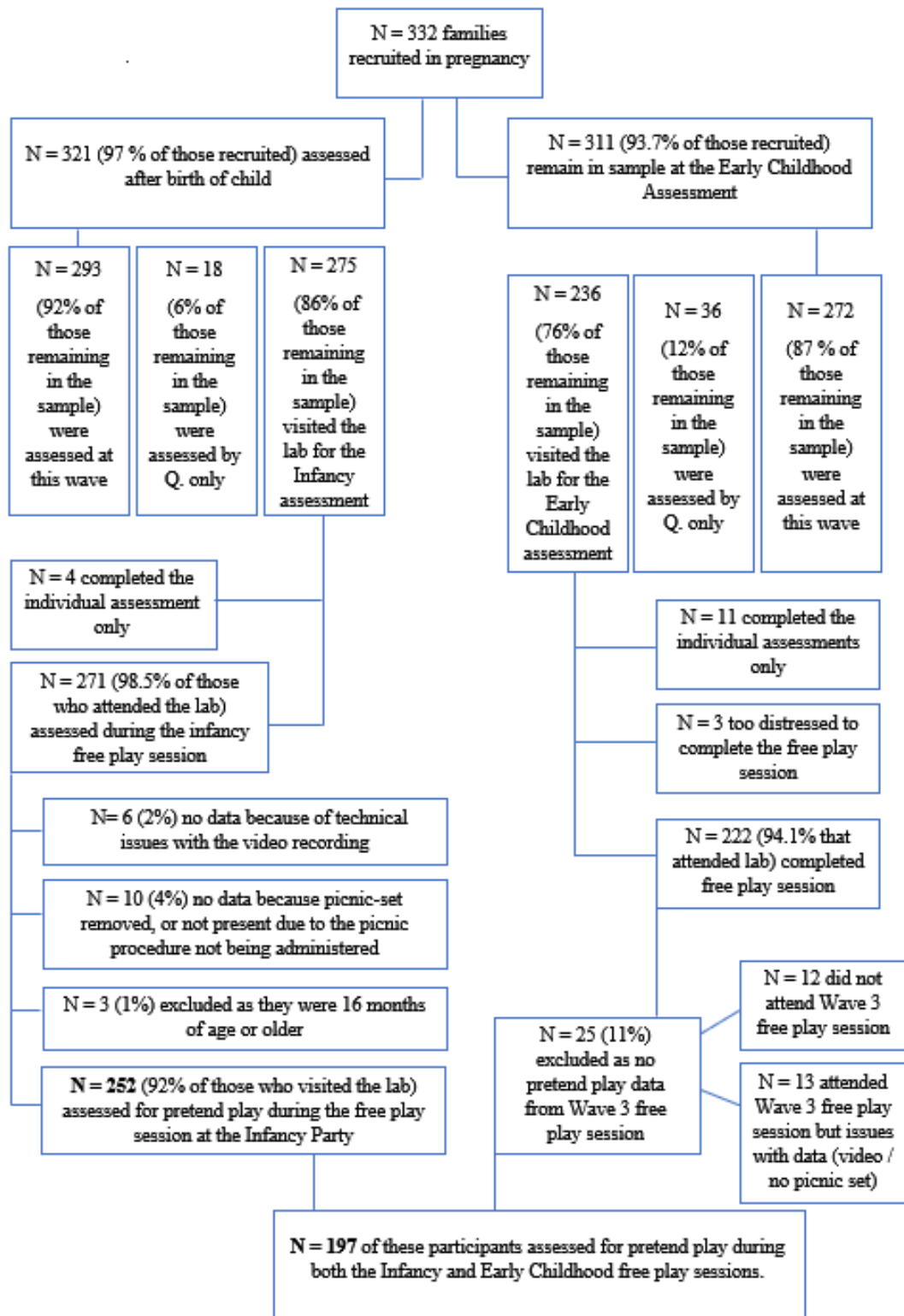


Figure 5.1. The progression of the Cardiff Child Development Study (CCDS) sample from the 332 families recruited in pregnancy, to the infants that were observed for early pretend play, to the children that were observed for pretend play in early childhood and formed the group of children used in the subsequent longitudinal analyses.

Table 5.2

Demographic characteristics for the original participants of the Cardiff Child Development Study (CCDS) and the subsamples observed and analysed for pretend play in Study 2.

Demographic Variables	Original sample recruited in pregnancy N = 332	Infancy Party (Observed for pretend play) N = 252	Early Childhood Party N = 222	Early Childhood Party (Observed for pretend play) N = 197
Mother's Age at Birth (Mean)	28.2(<i>SD</i> = 6.35)	28.8(<i>SD</i> = 6.09)	29.1	29.3
Stable Partnerships	90.4%	90.5%	93.2%	92.4%
Marital Status (% married)	50.3%	54.4%	55.9%	56.9%
Ethnicity (% British or Irish)	92.7%	92.6%	93.5%	94.2%
Social Class (% middle class)	50.9%	56%	58.1%	59.4%
Mother's Education (% > basic qualifications)	78.3%	82%	81.5%	84.4%
Child's Sex (% female)	43.3%	44.4 %	43.2%	44.2%
Adversity Factor Score (Mean)	.00 (<i>SD</i> = .99)	-.11 (<i>SD</i> = .95)	-.18 (<i>SD</i> = .88)	-.197 (<i>SD</i> =.87)

Additionally available for the children and caregivers at both parties were a selection of soft teddy bears; a box of Duplo; jigsaws; puppets (although the puppet characters changed at the Early Childhood party); and a selection of reading books (see Figure 5.3 for the items available at both parties).

At only the Infancy Party, there were additional age-appropriate soft toys, a plastic duck toy and a jack in a box toy available (see Figure 5.3). Age-appropriate toys available only at the Early Childhood party included: a plastic safari aeroplane toy with plastic toy animals; plastic figures in plastic cars (emergency services; ambulance; fire; police); and a plastic telephone (see Figure 5.3).

The analyses in this chapter additionally derive from informants' completion of questionnaires during the Early Childhood assessment (See Chapter 3 for procedural details) and informants' participation in interviews and completion of questionnaires during Wave 1 and Wave 2 of the CCDS study (see Chapter 3 for procedural details).

(1)



(2)



(3)



Figure 5.3. (1) Toys (and books) available at both the Infancy and Early Childhood parties (+ jigsaws); (2) toys available at the Infancy party only (3) toys only available at the Early Childhood party. NB. Only a small selection of the books is shown.

5.2.3 Measuring Pretend Play and Other Measures

In Study 1, I developed the Pretend Play Observational Coding Scheme-Toddler module (PPoCS-T). In the discussion of the different types of actions and activities that have been considered as fitting the conceptualisation of pretend play as nonliteral, ‘as if’, transformational play I presented in Chapter 2, it was evident that across the infancy to early childhood period, new types of pretend play continue to emerge. For example, object substitutions were noted as rare before 19 months of age (Rubin et al., 1983; Lillard, 2015); confirmatory speech indicating pretend enactments are not evident in the infancy period (aside from sound effects); and role play enactments are noted as not being present for the vast majority of children until around 3 years of age (Westby, 1991). Therefore, it was necessary to adapt the coding scheme for the current investigation and develop different age-appropriate modules of the Pretend Play Observational Coding Scheme for coding pretend play during the Infancy and Early Childhood parties: the ‘Infancy’ and ‘Early Childhood’ modules. Developing different age-appropriate modules was also considered necessary because there was variation in the toys used in the home visit in Study 1 to the toys used in the laboratory visits in Study 2 (a kitchen toy set in Study 1, rather than a toy picnic set in Study 2); thus, there were pretend enactments specific to the toys provided (e.g., *pretend to season* with saltshaker from the kitchen toy set used in Study 1). Furthermore, initial observations of the video records from the free play sessions from the different waves of the CCDS study illuminated some motoric modifications of behaviours across the different age brackets (e.g., with the enactment of *pretend to drink*). The new age-appropriate modules were developed at the beginning of Study 2, using a random selection of the video records and existing literature (to be discussed), and then applied to the full sample. Because the toys in the environment were standardised at the Infancy and Early Childhood sessions, only pretend play enactments that were explicitly operationally defined were recorded and coded

(see Appendix D and E). Appendix F presents a depiction of the pretend play enactments included, and operationally defined, on all modules of the PPOCS (e.g., *Pretend to drink*), and the enactments that were specific to the different modules/waves of data collection (e.g., *role play*).

5.2.3.1 The Pretend Play Observational Coding Scheme - Infancy module

(PPOCS-I). The newly developed PPOCS-I (described in detail in the following section and presented fully in Appendix D, including the instructions provided to observational coders) was used to code observed instances of infants' pretend play at the Infancy Party.

Measurement of pretend play began when the birthday lady left the room following the Teddy Bear's picnic procedure (Hay et al., 2016; see Chapter 3) and finished after 20 minutes of continuous observation time. See Appendix H for an example of a coded transcript from the Infancy party. Although multiple participants attended each party, each participant at the birthday was coded individually for pretend play.

As with Study 1, a dichotomous variable indicating whether infants displayed any pretend play during the free play session was created, *observed pretend play* (see Chapter 4, section 4.2.3.2.3); one enactment of pretend play was sufficient for the infant to be categorised as displaying pretend play. A second variable indicating the frequency of infants' pretend play was created for each participant by calculating the total number of pretend enactments recorded at Level 2 confidence rating (see Chapter 4, section 4.2.3.2.3). The *frequency of pretend play* measure was a composite variable that summed across the different types of pretend play; the measure represents the total number of pretend play enactments observed.

5.2.3.1.1 Development of the Infancy Module: *The Pretend Play Observational Coding Scheme - Infancy module (PPOCS-I: presented in full in Appendix D)* was adapted

from the original toddler version of PPOCS. The coding scheme was designed to be a conservative measure of pretend play. For example, the enactment of *pretend to sleep* was not included on the infancy scheme. Without “confirmatory vocalisations” (Barton, 2007, p. 7), it is difficult to ascertain infants possible pretend sleeping actions as non-literal enactments (and no child was observed vocalising pretend sleeping noises during the infancy party). As discussed, *object substitutions* and *verbal pretend play enactments* are noted to appear later in development than infancy, so were excluded from the infancy module (except for the inclusion of sound effects in the operational definitions for specific enactments). Further enactments and operational definitions specific to the kitchen set provided during the toddler home visit (e.g., *pretend to season* using the saltshaker; raises pan containing plastic egg to mouth) were also removed. The infancy module (The PPOCS-I) therefore focused on identification of five specific pretend play enactments with the picnic set and toys: *pretend to drink (pretend action toward self)*; *pretend to eat (pretend action toward self)*; *pretend to pour (pretend action toward object)*; *pretend to feed other (peer or adult; pretend action toward other)*; *pretend to feed other (inanimate object; pretend action toward other)*.

Because infants cannot signal their pretend play through verbal confirmations (aside from sound effects), there is further need for clear evidence that the infant is pretending, not just responding to the affordances of play objects (see Chapter 2). Therefore, I added further comprehensive operational definitions to the infancy module that clearly detailed the exaggerated and elaborated elements necessary to observe when identifying infants as displaying the five early pretend play acts with the toy picnic set and other toys. Such elements included: exaggerated holding duration times of cups held at the infant’s mouth and duration of elaborated holds of objects while pretending to pour; the angles of tilts required to indicate a movement was exaggerated enough to be coded as pretend drinking or pretend pouring; sound effects that could accompany motor acts to indicate early pretend play.

Previous authors have noted these play signals but have not specified hold durations or rotation angles. Furthermore, as I discussed in Chapter 2 (section 2.1.6), the play signals noted by previous authors are not consistently operationalised for each type of possible enactment with the available toys.

The operational definitions (and exclusion criteria) were revised and amended from the original PPOCS through initial investigation of the video records of the free play sessions conducted during the Infancy party and further examination of the previous literature specific to the age range of the children in the study, i.e., 11 to 15 months of age (the references presented in Appendix A; Jackowitz & Watson, 1980; Vondra & Belsky, 1991). I initially used the original PPOCS on a randomly selected subsample of 84 videos (33.33% of the infants who were able to be observed for pretend play; I observed pretend play displayed by $n=27$, 32% of children). Following this, through review of the coded transcripts and video records, and consensus meetings with the PI of the CCDS project, I examined commonalities across the enactments considered to be exaggerated and elaborated (i.e., enactments coded as pretend play and awarded a confidence rating of Level 2; see Study 1, Chapter 4, for information on the confidence rating scale), or those considered to not fully meet the criteria (i.e., enactments awarded a Level 1 or Level 0). For example, in the initial investigation, the durations of tilts and holds consistently considered as ‘exaggerated’ or ‘elaborated’ and meeting a Level 2 confidence rating were all enacted for two seconds or more; thus, a two-sec duration was added to the operational definitions. I also developed definitions for examples of possible pretend play (see Appendix D); however, this was not intended to be an exhaustive list. Some operational definitions from the original scheme were edited to enable the coder to more clearly identify the infant as performing a pretend enactment through clearer presentation of the play signal; some additions were made to the operational definitions from the previous literature, e.g., the infant enacting ‘lip smacking’ movements

(e.g., Jackowitz & Watson, 1980). The original coded enactments were then reviewed with the amended definitions. Enactments not meeting the new definitions were excluded, and the PPoCS-I was applied to the full sample of video records ($N=252$). While excluding enactments that did not meet these conservative criteria may have led to some possible pretend play being missed, it has been noted by Baron-Cohen (1987) that error in over- or underestimating pretend play “will be a feature of all definitions of pretend play” (p. 140). Some further amendments were made to the PPoCS-I during the data coding process via consensus meetings with myself and the PI of the CCDS project (see Appendix x for presentation of the final manual).

5.2.3.1.1.1 Establishing reliability. Two observers independently coded a random 20% ($n=50$), of the video records from the Infancy party using the PPoCS-I. Intraclass correlation coefficients (ICC) were calculated to measure agreement across the observers for the frequency of pretend play; ICC inter-rater agreement indicated excellent observer agreement (Cicchetti, 1994), $ICC = .98$.

5.2.3.2 The Pretend Play Observational Coding Scheme - Early Childhood module (PPoCS-C). The newly developed PPoCS-C (described in detail in the following section and presented fully in Appendix E) was used to code observed instances of children’s pretend play during the Early Childhood Party. Measurement began when the birthday lady left the room following the Teddy Bear’s Picnic procedure (see Chapter 3) and finished after 20 minutes of continuous observation time. See Appendix I for an example of a coded transcript from the Early Childhood party. Although multiple participants attended each party, each participant at the birthday was coded individually for pretend play. As with the data from the Infancy party, two variables were created, one measuring whether children displayed any pretend play, and the other measuring the frequency of pretend play displayed by each child (*observed pretend play; frequency of pretend play*).

Because of cancellations and rescheduled visits, there was sometimes variation with the number of peers present at the parties (two, three and occasionally four peers); however, the frequency scores at parties with two, three and four participants were not significantly different. Similarly, there was no significant difference between the frequency scores as a function of gender composition (mixed; single sex boys; and single sex girls).

5.2.3.2.1 Development of the Early Childhood Module. The Early Childhood module (PPoCS-C) built on the previous modules, operationalised (adapted, modified and combined) through initial observation of a random selection of the video records of the 20 minute free play sessions at the Early Childhood party; further review of age-appropriate coding schemes (e.g., Russell, 1981; Mcloyd, 1980; Haight & Miller, 1993; Westby, 1991; Veneziano, 2002; Ebeling, 2011; Harrop et al., 2017) and discussions with the PI of the CCDS project. Modification of some operational definitions was necessary to ensure the definitions were developmentally appropriate. Operational definitions and examples that were specific to the toys available were added (e.g., examples of *verbal pretend play enactments* with the safari aeroplane toy). The enactment item *role play* was additionally added to the scheme, operationalised during initial observations of a randomly selected group of videos and adaptations of previous observational coding schemes that included a similar code (e.g., Smilansky, 1968; Olszewski & Fuson, 1982; Russell & Russnaik, 1981; Thorp et al., 1995; Youngblade & Dunn, 1995; Nielsen & Dissanayake, 2000; Kasari et al., 2006; Harrop et al., 2017; see Chapter 2). Before applying the PPoCS-C to the full sample of video records, reliability of the module across observers was established on the frequency of pretend play enactments identified using the PPoCS-C.

5.2.3.2.1.1 Establishing reliability. A randomly selected 22% ($n = 44$) of the Early Childhood party video records were independently coded by two observers using the PPoCS-C. Intraclass correlation coefficients (ICC) were calculated to measure agreement across the

observers for the frequency of pretend play; ICC inter-rater agreement indicated excellent observer agreement (Cicchetti, 1994), ICC = .98. Following establishing reliability, the PPOCS-C was applied to the full sample of video records (N=197). No further amendments were made to the Early Childhood module following the reliability exercise; however, regular consensus meetings occurred with the PI of the CCDS project and myself during the full data coding process.

5.2.3.3 Informant-reported information on children's pretend play. A further measure of pretend play was derived from the informant-report questionnaires completed by the CCDS participants at Wave 5 of the study (Hay, Perra, et al., 2010). See section 4.2.3.1 for full details of this measure. Of the 197 children with observational data from the Infancy and Early Childhood parties, informant-rated data on children's pretend play during Early Childhood were available for $n = 173$ (88%).

5.2.3.4 Sociodemographic adversity score. Positive scores indicate the child has had higher than average exposure to maternal factors known to be associated with risk for social adversity (e.g., mother aged 19 years or younger at the time of child's birth; mother's occupation being classified as working class). Sociodemographic adversity scores were available for all 252 children observed for pretend play during the Infancy party, and for all 197 children observed for pretend play during the Early Childhood party.

5.2.4 Data Preparation and Data Analysis

The free play sessions at both time points (infancy and early childhood) were designed to last 20 minutes; however, sometimes the children left the birthday party room during the sessions (e.g., to use the bathroom). I wanted to ensure there were equivalent data for each of the participants; therefore, if a child left the birthday party room I calculated the total duration of time the child spent out of the room and if the duration of time in the room was less than 19

minutes the pretend play frequency score was prorated to 20 minutes. I calculated the prorated score using the duration of time the child spent in the birthday party room rounded up or down to the nearest minute.

The first set of analyses investigated the proportion of children at a mean of 12.8 months ($SD = 1.10$) who displayed pretend play during the Infancy Party. The age range of the children was from 10 to 15 months. These analyses confirmed that pretend play displays were shown at this time point, and so a longitudinal investigation of consistency and change was permitted.

The second set of analyses investigated if there were significant longitudinal change from the Infancy Party to the Early Childhood Party in both the proportion of children who displayed pretend play during the sessions and the frequency of pretend play actions. A McNemar's test was used to determine if the proportion of children showing at least one enactment of pretend play at a mean of 12.8 months (mean age at the Infancy Party) was significantly different to children showing at least one enactment of pretend play at a mean of 33.6 months (mean age at the Early Childhood Party)

Descriptive statistics for the frequency of pretend play actions at the two times points are presented in Figures 5.5; 5.6; 5.7. Visual inspection of a histogram depicting the prorated frequency scores from the Infancy and Early Childhood parties, and inspection of the skewness and kurtosis values (Table 5.3), showed that the frequency data at both times points were strongly and positively skewed, and not normally distributed; therefore, nonparametric statistical tests were used for all subsequent inferential analyses of the frequency data. For *continuity (consistency) v. discontinuity (change)* analyses with non-normally distributed data, Bornstein and colleagues (2017) recommend using a Wilcoxon signed-rank test. Consequently, I conducted a Wilcoxon signed-rank test to analyse if there was a significant

difference in the group frequencies of pretend play actions during the Infancy and Early Childhood parties.

Table 5.3

Skewness and kurtosis values: Infancy and Early Childhood Parties prorated frequency data

Assessment	Skewness	Kurtosis
Infancy Party	4.013	18.925
Early Childhood Party	1.924	4.454

The third set of analyses tested whether individual differences in the frequency of pretend play were stable over time. As recommended by Bornstein and colleagues (2017), Spearman's correlation coefficient was used to investigate if the children's frequency of pretend play at the Infancy Party was associated with their frequency of pretend play at the Early Childhood Party. Because only a small proportion of children displayed pretend play at the first time point, a further Mann-Whitney test was conducted to determine if those infants who pretended at least once at the first time point were more likely than their peers to pretend at high levels at the second time point.

The final set of analyses explored possible correlates of the individual differences. I investigated if sociodemographic adversity, or gender, were associated with the individual differences in displaying any pretend play (at the first time point only, as there was near ubiquitous displaying of pretend play at the Early Childhood party) and the frequency of pretend play actions at both time points. I then used Spearman's correlation coefficient to investigate if the frequency of pretend play children displayed at each longitudinal time point was associated with their chronological age at the time of each testing session.

5.3 Results

5.3.1 Do any infants display pretend play at the Infancy Party?

Fifty-nine (23%) of the 252 infants observed during the Infancy Party displayed at least one pretend play enactment. As the age of the children seen during the Infancy Party ranged from 10 to 15 months, I was able to explore if chronological age at the time of the observation was associated with children engaging in any pretend play. The youngest child to display pretend play during the Infancy Party was 10.71 months, displaying solely a *pretend action towards self*. Seventy of the 252 children observed for pretend play were under 12 months of age; of those, 10 (14.3%) showed at least one example of pretend play. However, as shown in the Figure 5.4, the mean age of children displaying any pretend play during the Infancy Party was significantly older than the children showing no pretend play $t(250) = -2.207, p = .03$.

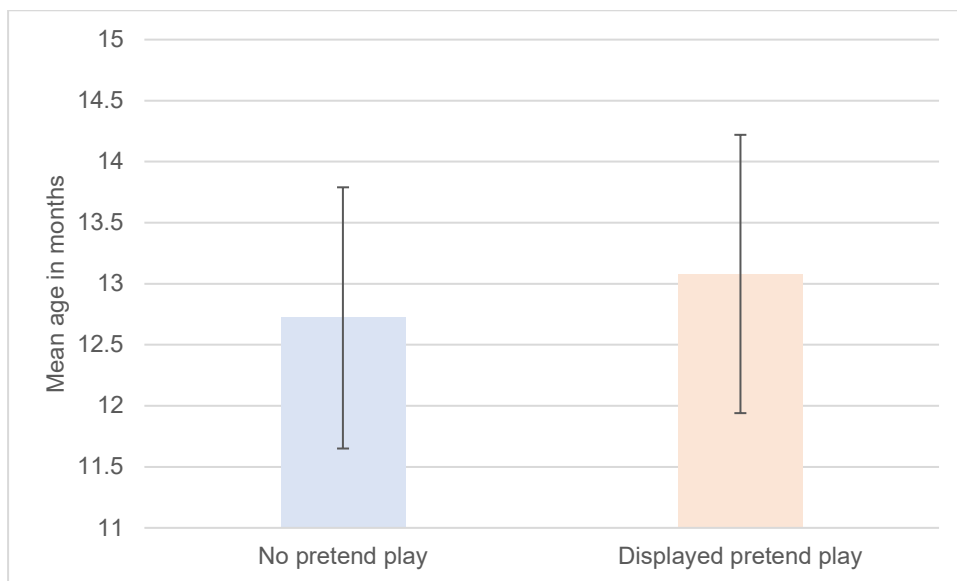


Figure 5.4. Mean age (months) of children displaying pretend play (or displaying no pretend play) during the Infancy Party. Error bars = 1.SD

5.3.2 Does Pretend Play Change over Time?

5.3.2.1 Proportion of children engaging in pretend play. Of the 197 children who took part in both the Infancy and Early Childhood Parties, 186 (94.4%) showed at least one

pretend play enactment during the Early Childhood Party. Eleven children observed at the Early Childhood Party showed no pretend play and five of these 11 children were recorded as displaying a possible pretend play action. The difference in the proportion of children showing at least one pretend play enactment during the Infancy (23%) and Early Childhood (94.4%) parties was highly significant, $p < .001$; thus, as expected, the proportion of children who showed pretend play rose significantly from the infancy to early childhood period .

The above findings are broadly in line with the informant report data on children's displays of pretend play. At the early childhood assessment point, 98.3 % of children were reported to be *showing pretend play* by informants. Three children (1.7%) had mean pretend play scores across informants below 1.00, and were classified as *not yet showing pretend play*; however, the mean pretend play scores of .33; .50;.50 for these three children indicated that while the children were reported to not yet show pretend play by one of more informants, at least one informant had also reported the child to *somewhat* show pretend play.

5.3.2.2 Frequency of pretend play actions. During the Infancy Party, the highest number of pretend play enactments displayed was 17. At the Early Childhood Party, the highest number of pretend play enactments displayed was 61. Figures 5.5 and 5.6 depict the frequency distributions of the number of pretend enactments shown during the Infancy Party and Early Childhood Party respectively. Figure 5.7 depicts the mean frequency of pretend enactments at both time points.

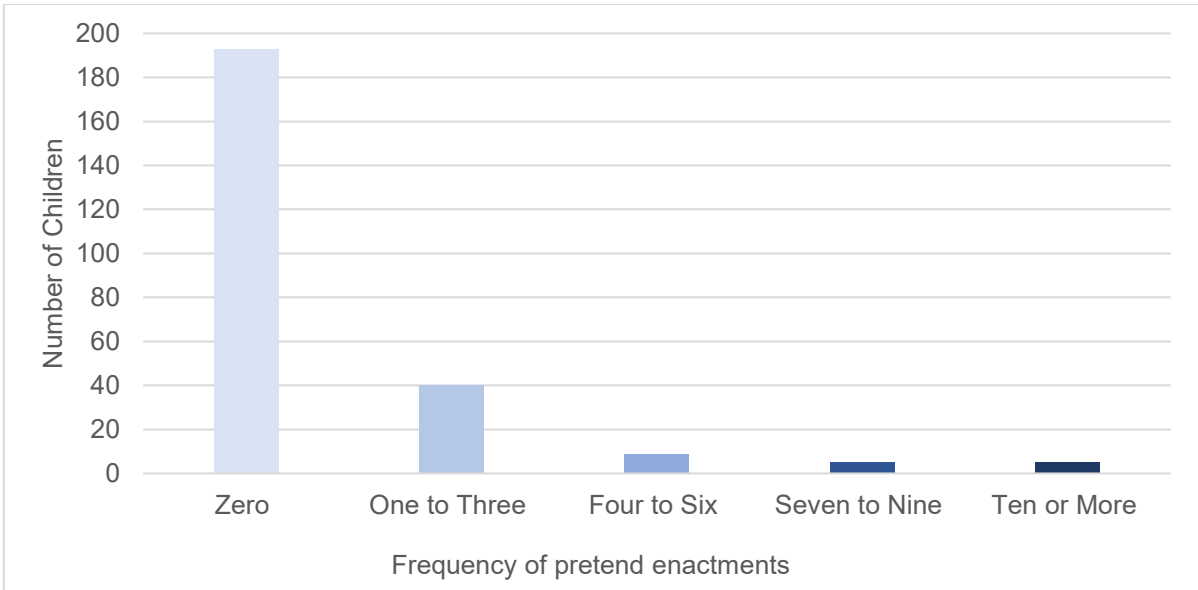


Figure 5.5. Frequency distribution of number of pretend enactments during the Infancy Party.

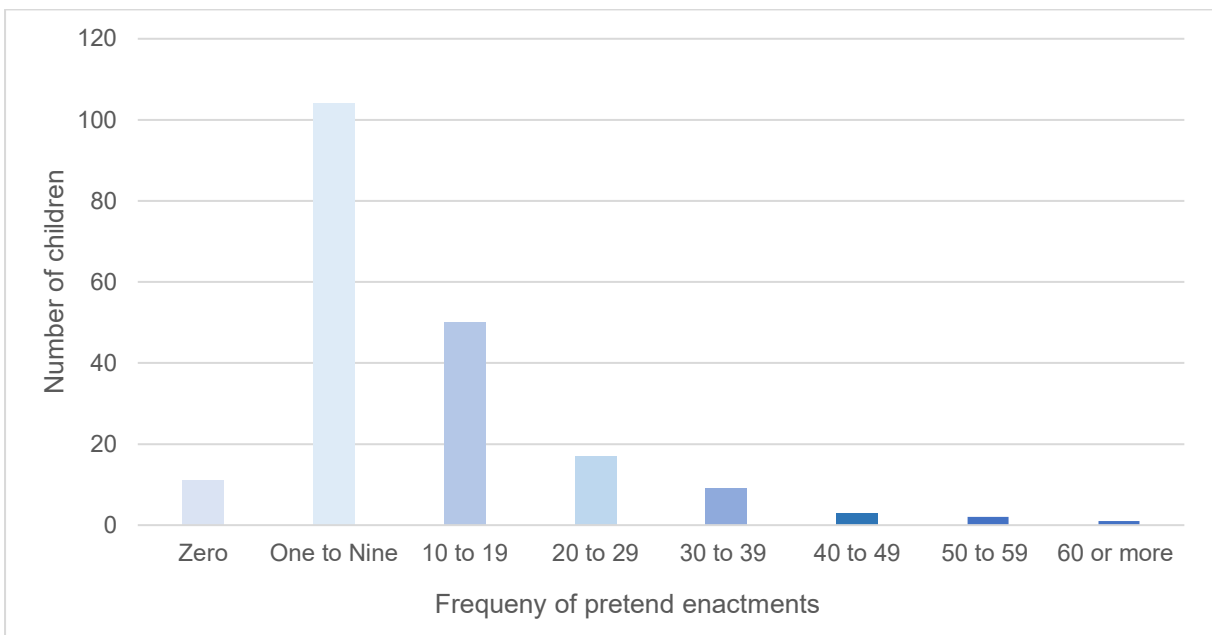


Figure 5.6. Frequency distribution of number of pretend enactments during the Early Childhood Party.

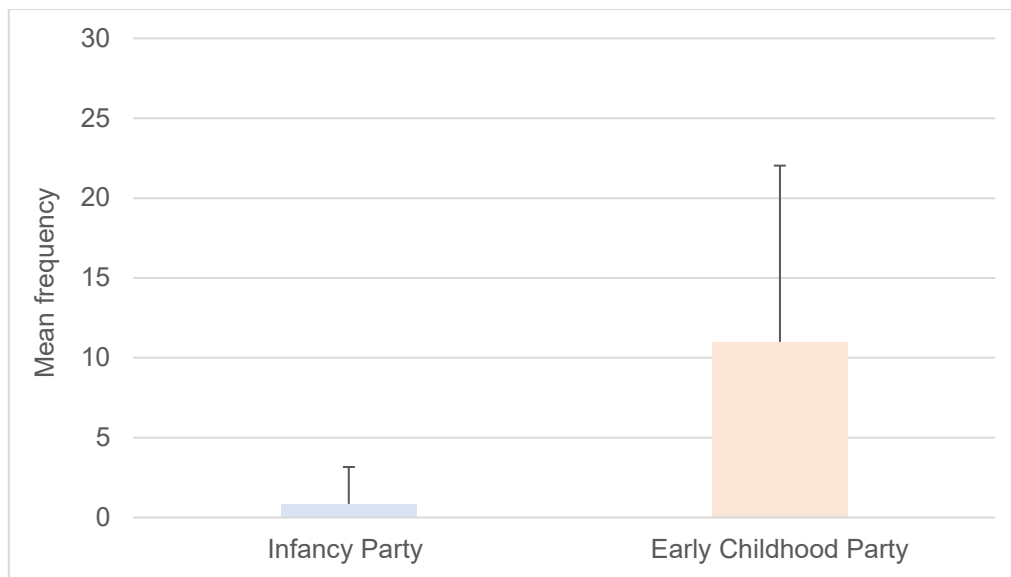


Figure 5.7. Mean frequency of pretend play enactments during the Infancy and Early Childhood Parties (20-minute observations). Error bars = +1SD.

The median frequencies of pretend enactments during the Infancy and Early Childhood parties were .00 (range = 17, IQR = 0.00—0.00) and 8.00 (range = 61, IQR = 3.00—14.87) respectively. There was a highly significant change (increase) in the median frequency increase across time ($z = 11.41, p < .001$).

It was not an aim of the current study to investigate consistency and change in the types of pretend play displayed by the children; free play sessions are likely not suitable for measurement of competency for showing different types of pretend play (Belsky, Garduque, & Hrcir, 1984; Vondra & Belsky, 1991; Kelly-Vance et al., 2002); however, for exploratory purposes, Table 5.4 presents the number of children who displayed the different types of pretend play at the two time points. It is important to note that reliability across observers was established on children displaying any pretend play, and on the total frequency of pretend play shown, but reliability was not examined for observation of the different subtypes of pretend play. Of note, at both time points, *pretend actions toward self* (e.g., *pretend to drink; pretend to eat*) were displayed by more than half of the children who engaged in pretend

play; the actions were part of the pretend play repertoire in the infancy and early childhood periods. Appendix J additionally presents the number of children who displayed the different types of pretend play across the infancy, toddlerhood, and early childhood assessments (i.e., across Study 1 and Study 2); at both the toddlerhood and early childhood assessment points, *pretend actions toward self* (e.g., *pretend to drink*; *pretend to eat*) were displayed by 54 % of the children who engaged in pretend play.

Table 5.4

Number of children displaying each type of pretend play during the Infancy and Early Childhood parties

Pretend play type	Number of children displaying at least one enactment of that type of pretend play	
	Infancy Party (% of children who showed any pretend play / % of full sample of children observed)	Early Childhood Party (% of children who showed any pretend play / % of full sample of children observed)
Pretend action toward self (e.g., pretend to drink; pretend to eat)	46 (78% / 18%)	100 (54% / 51%)
Pretend action toward object (e.g., pretend to pour; pretend to stir)	20 (34% / 8%)	123 (66% / 62%)
Pretend action toward other (e.g., pretend to feed other)	13 (22% / 5%)	111 (60% / 56%)
Object substitution	N/A	22 (12% / 11%)
Any verbal pretend play enactment	N/A	166 (89% / 84 %)

Note. Verbal pretend play enactments include where the verbal enactment ‘duplicates,’ ‘specifies’ or ‘creates’ the pretend play, see section 2.1.3.3; for example, the verbal enactment could duplicate the coding of a different category of pretend play, e.g., child pretends to drink with exaggerated tilt (pretend action toward self), accompanied by a slurp (verbal pretend play enactment) or the verbal enactment could be considered *to be* the pretend enactment, e.g., child runs across the room and shouts, ‘I am batman’!

N/A = not part of the Pretend Play Observational Coding Scheme age appropriate module used for measuring pretend play.

5.3.3 Are individual differences in pretend play stable over time?

There was a small but significant positive correlation between the frequency of pretend play actions at the two time points $r_s = .14, p = .044$. This finding indicates that those children who showed a relatively higher frequency of pretend play at the Infancy Party similarly showed a relatively higher frequency of pretend play at the Early Childhood Party.

Similarly, using the dichotomous measure of showing any pretend play during the Infancy Party, the frequency of pretend play during the Early Childhood Party was significantly higher in children showing any pretend play ($Mdn = 10.50$) than in children showing no pretend play during the Infancy Party ($Mdn = 7.00$), $U = 4,264, z = 2.004, p = .045$.

To try to understand the stability in pretend play further, I ran a supplementary Spearman's correlation to explore the relationship between the frequency of pretend play actions shown at the two time points in the subsample of children who showed *any* pretend play at the first time point only (i.e., the group of children who showed no pretend play at the first time point in infancy were excluded from this later correlation analysis). Of the 59 children who showed any pretend play during the Infancy Party, 48 were also observed for pretend play during the Early Childhood Party. During the Infancy Party, the average number of pretend play enactments shown by this group of 48 children was low ($Mdn = 2.00, IQ = 1.00—4.00$). In contrast to the stability analysis I ran on the full sample of children ($N = 197$), within this subsample, I found no significant association between the frequency of pretend play shown at the two time points, $r_s(46) = .06, p = .701$.

5.3.4 Are individual differences in displays of pretend play associated with social adversity, or gender at either time point?

5.3.4.1 Individual differences in displaying at least one pretend play enactment.

Thirty girls (12%) and 29 boys (11%) displayed at least one pretend play enactment during the Infancy Party, which was not a significant difference. There was no association between displaying at least one pretend play enactment during the Infancy Party and the family's sociodemographic adversity.

5.3.4.2 Individual differences in frequency of pretend play enactments. Children's frequency of pretend play enactments during the Infancy Party was not associated statistically with family's sociodemographic adversity; this was also the case for the frequency of pretend play observed during the Early Childhood Party. Similarly, there were no significant differences between boys' and girls' frequency of pretend play at either time point.

5.3.5 Is frequency of pretend play associated with chronological age in months at each time point?

During the Infancy Party, children's chronological age was correlated with their frequency of pretend acts $r_s(252) = .15, p = .021$. However, there was no significant association with children's chronological age and their frequency of pretend play acts shown during the Early Childhood Party (age range 29.52 to 41.20 months).

5.4 Discussion

5.4.1 Summary of Findings and How They Relate to Other Research

The overarching aim of this study was to use the longitudinal data from the Cardiff Child Development Study to examine consistency and change in children's pretend play from infancy to early childhood in a representative community sample. I examined if infants around one year of age could engage in pretend play, if there was a change in the number of

children showing pretend play across time, and if pretend play displays were universal by early childhood. I investigated if the frequency of children's pretend play changed over time, and if individual differences in pretend play during infancy showed stability over time. I further explored whether gender, sociodemographic status and chronological age were associated with children's displays of pretend play.

Displays of pretend play were evident during the Infancy Party; 23% of the infants displayed at least one pretend play enactment. The findings replicate earlier smaller studies in showing that some infants can display pretend play around the time of the first birthday (e.g., Lowe, 1975; Fenson et al., 1976; Fenson, 1978; Belsky & Most, 1981; McCune, 1995; Morrissey, 2014). As I observed displays of pretend play prior to the first birthday, the findings additionally replicate previous studies in observing that pretend play can be displayed by some children around 10 months of age (e.g., Largo & Howard, 1979; McCune, 1995; Morrissey, 2014; Orr & Geva, 2015).

The coding scheme used to measure pretend play at the Infancy Party included comprehensive operational definitions for each type of pretend play act with a picnic set, detailing key exaggerated and elaborated play signals that were needed to accompany early acts to code them as pretend play behaviours. These ludic elements supply evidence that the infant was signalling entering into play (Garvey, 1977; Weisberg, 2015) and differentiates the actions from exploratory behaviours that may simply be afforded by an object's salient physical features (Haight & Miller, 1993). The coding definitions required that the infant was focused on the actions; this focus, along with the required exaggerated or elaborated elements, suggests that the infant was demonstrating an awareness of knowingly and deliberately bringing an alternative, non-literal, reality to the play situation (i.e., the empty cup now contains liquid; the empty cup can be used to drink from). This awareness is a requirement of some earlier definitions of pretend play (e.g., Piaget, 1962; Lillard, 1993).

While it is not possible to prove infants have any awareness of behaving in a non-literal manner until they can speak, the coding scheme ensured that the coded actions had moved beyond behaviours based on the simple affordances of objects.

The new early pretend play observational coding scheme advanced on the level of detail provided on previous pretend play observational coding schemes used with infants (e.g., Belsky & Most, 1981; McCune, 1995, and others). The use of the ‘possible’ pretend play category (the actions coded at Level 1, which were excluded from the total) ensured a conservative measure of infant pretend play and ensured that only infants fully meeting the criteria were confirmed as displaying pretend play. McCune (1995) noted that earlier studies of infant pretend play may have recorded “false positives” during measurement, i.e., recording behaviours that were not actually pretend play behaviours. The conservative nature of the new coding scheme should help avoid this issue. The inclusion of “false positives” might explain why the percentage of infants demonstrating pretend play in the current study was lower than in some previous work where pretend definitions were not as clearly defined in terms of the exaggerated elements that signalled play (e.g., Lowe, 1975; Fenson et al., 1976). Alternatively, the use of a larger, more representative sample may have supplied a more accurate measure of levels of pretend play in general populations.

As expected, there was significant developmental change from infancy to early childhood in the proportion of children who showed any pretend play during the free play scenarios. During the Early Childhood Party, 94% of children showed at least one pretend play enactment. The observational findings were broadly in line with the informant report data on the proportion of children rated as showing pretend play. The findings are also in line with previous studies that have observed the free play of children aged 2.5 to 3 years, which showed that most children to show at least one pretend play enactment during free play sessions (e.g., Fenson, 1984; Howes, 1985; Shimado & Sano, 1984; Haight, Wang, Fung,

Williams, & Mintz, 1999; Brown et al., 2001). The current study extends earlier findings with the use of a representative community sample of children in the UK.

There was significant longitudinal change from infancy to early childhood in terms of children's frequency of pretend play during the free play sessions. The increase of the mean frequency of pretend play over time is in line with other longitudinal studies that have followed children from around the time of the first birthday to around 3 years of age (Russell, 1981; Zerwas, 2003); it appears that, at the level of the group, children's frequency of pretend play shows *discontinuity* in development from one to three years of age (i.e., the frequency changes significantly). The current study replicates earlier findings but also shows that this developmental change is present in a sample of children representative of the general population.

Alongside this change (i.e., increase in mean frequency from infancy to early childhood), stable individual differences in frequency of pretend play across time were evident. Although the correlation across time was small, children who displayed a relatively higher frequency of pretend play at the first time point similarly displayed a relatively higher frequency of pretend play at the second time point. Those children who showed any pretend play at the Infancy Party also engaged in pretend play more often at the Early Childhood Party. The findings are in line with those earlier reported by Zerwas (2003), who similarly found correlations between the frequency of pretend play acts at 15 and 36 months of age. The current study extends this finding to younger infants in a representative community sample. As Zerwas (2003) similarly studied a relatively large group of children, it appears that in cases where other studies have found no stability across time in the frequency of pretend play (i.e., Russell, 1981), they may have lacked statistical power to find associations with small effect sizes. Indeed, this may explain some seemingly contradictory findings in the current study. When children who did not engage in any pretend play during the Infancy

Party were removed from the correlation analysis of stability in pretend play, I found no significant association between the frequency of pretend play shown at the two time points (infancy and early childhood); this was in contrast to the stability found in the frequency of pretend play across time when the full sample of children were analysed. The dramatic reduction in sample size following the removal of the non-pretenders in infancy may have resulted in a loss of statistical power to find associations with small effect sizes. This idea is supported by the different findings on stability reported by Russell (1981) and Zerwas (2003), discussed above. Future research could look at associations across time in a larger sample of 'early' pretenders to shed more light on these questions of power. Alternatively, the findings in the current study may instead reflect that it is the action of engaging in *any* pretend play in infancy that shows stability to a later relative high frequency of pretend play in early childhood, rather than how frequently the pretend play is performed in infancy; possibly performing any pretend play in infancy can be viewed as the relatively high frequency of pretend play at that time point.

The use of a community sample permitted investigation into the impact of family circumstances on pretend play; individual differences in showing any pretend play enactments, or in children's frequency of pretend play, were not related to the family's sociodemographic adversity. Similarly, individual differences in showing any early pretend play, or the frequency of pretend play at either time point were not related to gender.

The age range at each time point permitted investigation into associations of chronological age at each point with children's frequency of pretend play. During the Infancy Party, chronological age in months was associated with a higher frequency of pretend play enactments; however, no association was found with chronological age and frequency of pretend play during the Early Childhood Party.

5.4.2 Implications of the Findings

The pattern of development in terms of pretend play appears to be what others refer to as *discontinuity-and-stability* (Kwak et al., 2008; Bornstein et al., 2017). Kwak and colleagues (2008) referred to a discontinuity-and-stability characteristic as one where “the mean group level could change over time (increase or decrease), but individuals in the group remain consistent in their relative standing” (p. 4); this fits the picture of what was seen with the frequency of children’s pretend play in the current study.

By showing stability from the early measures of pretend play to the later measures of pretend play there is evidence of measurement of the same psychological construct at the two time points; stability over time is a traditional criterion for construct validity (Cronbach & Meehl, 1955). As discussed in Chapter 2, there is debate in the literature as to whether infants’ early actions with miniature replicas are forms of pretend play. The stability over time demonstrated in this study provides further evidence that infants’ displays of pretend actions with miniature replicas and toddlers’ displays of more mature forms of pretend play are both measures of the construct of pretend play.

Vondra and Belsky (1991) suggested that children’s pretend play performance, i.e., “the highest level of play infants spontaneously exhibit during the course of free play,” differs from children’s pretend play competence, i.e., “the highest level of play children demonstrate when encouraged to move beyond their level of performance, via imitation, modelled behaviour and/or verbal suggestion” (p. 16). Consequently, free play sessions have been considered useful for assessing more motivational differences in play but not desirable for assessing children’s optimal play competence (Vondra & Belsky, 1991). The data presented in this study cannot assess whether free play sessions are useful for assessing competence for displaying advancing types of play, which is what play competency assessments are usually concerned with (i.e., moving from exploration to self-pretend to

substitution enactments, Belsky & Most, 1981). However, as the observational and informant-rated data on the proportions of children displaying pretend play during early childhood were broadly in line, the data do suggest that twenty-minute observations of children's free play in a controlled laboratory, with developmentally appropriate toys and a toy picnic set, are broadly useful for assessing competence for engaging in *any* pretend play around three years of age.

If 20 minute free play laboratory sessions are useful for assessing children's competency for engaging in *any* pretend play, it could be considered that the percentage of children showing pretend play at the Infancy Party in the current study broadly reflects the proportion of children who possess the competence to show pretend play in that age range. Consequently, as only a minority of children showed pretend play, the data support the conclusion that there are individual differences in onset of pretend play around the first birthday; however, additional measures of pretend play competence at the first time point would be required to understand these individual differences further. Children may not have displayed pretend play for other reasons than having a lack of competence to do so.

With regards to the longitudinal findings, as the group frequency of pretend play acts increased significantly over time, it may be that the increasing frequency of pretend play is a marker of increasing pretend play competence and sophistication. Consequently, the stability observed over time may reflect that showing any pretend play (or a relatively high frequency of pretend play) around one year of age demonstrates an early competence for pretend play, and that some children who achieve this competence at this young age then maintain this advanced competence at the later time point. Showing a higher frequency of pretend play at the later age could be interpreted as an advanced competence. However, researchers have previously noted that frequency counts are inadequate for measuring pretend play competence (Rutherford et al., 2007). The lack of any statistical association between

chronological age and frequency of pretend play during the Early Childhood Party (age range = 29 to 41 months) in the current study supports this notion and indicates that frequency counts are poor indices of play sophistication or developing cognitive maturity in early childhood; however, of course, chronological age is a weak measure of cognitive maturity. The frequency of pretend play increased over time from infancy to early childhood and was associated with chronological age during the Infancy Party but not during the Early Childhood Party; this suggests that the significant increase in frequency possibly occurs earlier in development. Previous studies support this idea; increases in the frequency of pretend play are reported from one to three years, but looking within this time frame, little change, or even a decrease in frequency of pretend play acts, from around the end of the second year into the middle (and end) of the third year is also reported (Largo & Howard, 1979; Russell, 1981; Zerwas, 2003). Further work exploring associations with established measures of cognitive maturity would be useful for future studies to explore, as would investigations of stability in frequency of pretend play at more longitudinal time points.

An alternative interpretation is that the stability in frequency of pretend play found in the current study could possibly reflect stable individual differences in children's preference, enjoyment, or tendency to engage in pretend play activities, possibly providing empirical support for Singer's (1973) question about whether alongside developmental trends in pretend play development, there are "specific children who show a predominance of imaginative play at very early age and persist in this pattern through adolescence?"¹⁴ (p. 49). The stability of individual differences across time shown in the current study may show that what has been termed as FO, where High FO children show more orientation towards imaginative activities and engage in more pretend play and create more imaginary companions (Pierucci et al., 2014), can be found earlier in development than previously

¹⁴ Singer provided some empirical evidence, but for children older than those in the current study.

studied. It may be that some children show an early preference for pretend play and this remains stable across development; an early preference may be revealed by simply engaging in *any* ‘early’ spontaneous pretend play during unstructured free play. Acredolo and colleagues (1995) found an association between time spent with toys affording of pretend play at 11 months and having an imaginary friend at four years of age; future work should explore if the stability measures used in the current study (i.e., children’s showing any pretend play, and children’s frequency of pretend play) around the time of the first birthday are also associated with later experiences of having an imaginary friend and other later measures of fantasy preference. Such investigation would shed more light on the notion of stable individual differences in orientation towards pretending, imagination and fantasy that possibly originate in infancy.

5.4.3 Study Limitations

While the study advanced on earlier research by demonstrating the stability of individual differences in displays of pretend play from around the first birthday (10 to 15 months of age) to around three years of age, it did not explain why stability was observed; however, this was not the aim of the study, which was primarily to investigate if stability of individual differences would be found. As Bornstein and colleagues (2017) note, “stability is usually ascribed to consistency of that characteristic *in* the individual. However, stability might also be attributable to... a stable environment... that supports stability in the target characteristic.” (p. 4). For example, in the current study, it may be that the parents of the early pretenders who later became high frequency pretenders, provided stable high levels of encouragement (possibly reflecting stable levels of encouragement usually performed in the home environment), or interacted with those children more during the parties. It has been found previously that more complex play is displayed when children play with mothers than

when alone (Fiese, 1990). Future work could also independently code caregiver behaviours and include questions on caregivers' beliefs around the importance of pretend play.

It was a strength of the current study that the same toys were available to all children, and that there was some consistency with the toys available at the two longitudinal time points (e.g., the same toy picnic set); toys type has been shown to impact on the quality and complexity of children's play, with access to kitchen set toys and Duplo sets (as used in the current study) linked to higher levels of play and pretend play complexity (e.g., Cherney et al., 2003; Trawick-Smith et al., 2015). Thus, provision of standardised toy sets may be important for reducing variance in pretending arising due to differing access to toys. However, the current study did not explore children's prior experience and familiarity with the toys provided, and possibly some of the variation in the frequency of pretend play could be attributed to such factors. Although some earlier work demonstrated that prior familiarity with toys was not predictive of overall levels of pretend play production, or the production of specific subtypes of pretend play, additional work is needed to understand the influence of toy familiarity on children's pretend play (Kang, Klein, Lillard, & Lerner, 2016). To understand the effect of familiarity of toys on children's pretend play further, future work could replicate the current study but also include a brief questionnaire to caregivers on the availability of toys in the home environment to measure children's familiarity with the toys presented during the free play sessions.

Children were observed in the presence of unfamiliar peers, but the study did not explore if children's social competence with unfamiliar peers was related to their displays of pretend play. However, previous findings reported from the CCDS, on infants sociability with peers during the Infancy Party, show that half of infants observed during the birthday party offered objects to their peers and sharing toys was significantly more common than tugging on them (Hay et al., 2017); therefore, the findings suggest that the absence of pretend

play in around three quarters of children in infancy did not reflect a lack of sociability with peers.

The use of age-appropriate operational coding scheme modules at the two time points could be viewed as limiting the continuity and stability analyses. However, ensuring the coding scheme provided developmentally appropriate, reliable measures of children's frequency of pretend play at the two time points was the most important consideration; this required additional types of enactments to be included at the later time point and some divergence of specific operational definitions at the two points.

5.4.4 Conclusion

Pretend play was observed around the time of the first birthday, in a minority of infants. The proportion of children observed to display pretend play increased significantly over time, to near ubiquitous engagement in pretend play during the early childhood session. The observational data were in line with the informant report data; it appears that the capacity to engage in at least one bout of pretend play had emerged for almost all children by the early childhood period. Alongside this significant increase in displays of pretend play over time, in the proportion of children displaying pretend play but also in the frequency of pretend play shown, it was found that infants who had displayed any pretend play, and those who engaged in more frequent pretend play in infancy, displayed more frequent pretend play in early childhood. The current study is one of the first to confirm that there is stability of individual differences in displays of pretend play from around the time of the first birthday to the early childhood period. Furthermore, the study advanced on much of the previous observational studies of early play by investigating displays of pretend play longitudinally, in a community sample of children representative of the wider UK population studied using a mixture of data collection methods.

Chapter 6

Summary and Conclusions

The overarching aim of this thesis was to investigate fundamental questions about the emergence and development of pretend play. To address gaps identified in the existing evidence, the body of work investigated the emergence and development of pretend play in a relatively large community sample of children, nationally representative of the UK population, followed longitudinally from around the time of the first birthday, through toddlerhood, and into early childhood. Further advancing on the existing literature, a mixed method approach was used; data gained from observations of the community sample of children during spontaneous free play in the second and third years of life were combined, and compared, with data gained from informants' reporting on children's pretend play competence at the same assessment points. To extend the existing evidence base, displays of pretend play were identified during free play using a new observational coding scheme; the new scheme included comprehensive and reliable operational definitions that clearly noted the child's observable use of behaviours that signal play and signpost non-literal orientation.

The specific empirical findings from the investigations were discussed at length in their respective chapters. The aim for this final chapter is to summarise insights gained from the findings across the studies, in relation to the fundamental questions posed in Chapter 1.

6.1 Combining the Findings across the Investigations

The thesis aimed to investigate when pretend play emerges for the vast majority of children in general populations. In Study 1, which focused on Wave 4 of the CCDS, it appeared that pretend play had yet to emerge for some of the children who were observed at home at 17 to

24 months of age. Around 14% of toddlers at this time point were classified as displaying no observed pretend play by researchers and reported as not yet engaging in pretend play by at least one questionnaire informant. The individual differences identified were in line with the conclusions derived from the review of the literature conducted in Chapter 2; there appears to be some variation in the emergence of pretend play up to the end of the second year of life.

In Study 2, when children from the CCDS were investigated again in early childhood at a mean of 33 months of age, pretend play had emerged for almost all children; 98.3 % of children were reported to engage in pretend play by informants, and 94.4% of children showed at least one pretend play enactment during the Early Childhood Party. The findings across the studies in this thesis suggest that in general populations, pretend play appears for almost all children by some point during the third year of life. The findings are in line with cross cultural data; Callaghan and colleagues (2011) noted the average ages at which pretend play emerged for children sampled from Peru, Canada and villages in India were 23.5 months of age, 23.8 months of age, and 31.8 months of age respectively. However, the observational findings from Study 2 also revealed that some children display early forms of pretend play around the time of the first birthday; 23% of the infants displayed at least one pretend play enactment during the Infancy Party. The findings from Study 2 also revealed that these individual differences in displaying pretend play around the time of the first birthday were stable across time.

It appears that exposure to sociodemographic adversity may constrain the emergence of pretend play in the second, but not third, year of life. In Study 1, we saw that children categorised as not yet showing pretend play by 17 to 24 months of age (informant-reported pretend play scores) had experienced higher levels of exposure to sociodemographic adversity. However, as pretend play had emerged for the almost all children by the early childhood assessment (Study 2), it appears that the association with social adversity and the

capacity to engage in *any* pretend play does not extend into early childhood. Across Study 1 and Study 2, the other measures of pretend play (early displays of pretend play directly observed in infancy; informant-reported frequency of pretend play in the toddler years; displays of pretend play directly observed in the home during the toddler years and the frequency of pretend play directly observed during the laboratory observations in early childhood) were not significantly associated with social adversity. The observational measures of pretend play may be assessing not the construct of pretend play competence but rather a different construct; the performance of pretend play. This is in line with Rutherford and colleagues (2007) who noted that frequency counts of pretend play enactments were “a good index of performance, but not suitable as a measure of competence” (p. 1029).

The mixed method approach, and the alternating design of the CCDS in terms of home and laboratory observations, sheds light on how findings on the emergence and development of pretend play compare when different methods of data gathering are used. The thesis aimed to investigate if short, single, observations of free play are useful for identifying children’s capacity for pretend play. Within Study 1 a smaller proportion of children were directly observed to show pretend play during the observations of free play in the home than were reported to show pretend play by informants. In Study 2, the proportion of children observed to show pretend play during the laboratory observations at 33 months was more broadly in line with the informant-report data (although not fully in line). Taken together, the findings suggest that observations of free play in a standardised laboratory setting, with the provision of toys such as a picnic set and replica animal toys (soft and plastic), may be broadly useful for assessing children’s competence for engaging in *any* pretend play; however, observations of spontaneous free play in more natural environments (home and possibly school settings) may underestimate children’s competence for engaging in pretend play. Future studies of community samples of children studied in spontaneous free play in the

home environment in early childhood (and other time points) combined with informant-report data are needed to understand if observations in unstructured natural environments in the third year (and other time points) also underestimate competence for pretend play, or if this underestimation was restricted to the toddler period, in this study.

6.2 Limitations and Future Directions

Specific limitations in regard to Study 1 and Study 2 were discussed in their respective chapters. The main limitations arose from the Cardiff Child Development Study not being designed specifically for the measurement of pretend play. I will now outline some general limitations and resulting future directions across the body of work.

Across Study 1 and Study 2 we saw that the participation rate in the CCDS study dropped from the sample of families recruited in pregnancy. This is a feature of all longitudinal studies. Nonetheless, the relatively large community sample studied in this thesis is still larger and more diverse than many earlier observational studies on the rates of pretend play across the first three years of life.

The first half of the third year (24 months to 30 months) appears to be a crucial time for the universal emergence of pretend play in general populations (based on the literature review findings and the finding that nearly all children were showing pretend play in Study 2); however, the design of the CCDS study did not enable an intensive investigation of this time period¹⁵. While we saw were near ubiquitous displays of pretend play by early childhood in Study 2, at what point did pretend play emerge for the children who did not engage in pretend play in Study 1, but were reported to do so by Study 2? To fully understand when pretend play emerges for the vast majority of children, future longitudinal studies of

¹⁵ A small group of children were in this age range at Wave 4 of the CCDS, similarly a small group of children were in this age range at Wave 5 of the CCDS. The data were not analysed statistically because of the small group sizes; and any analyses would have been based on small, unrepresentative samples of children.

representative community samples should include direct observation and informant reports data gained from children aged between 24 to 30 months of age, in addition to the developmental periods investigated in the current thesis (combined with longitudinal data about later delay and disorder) to enable a more intensive look at displays of pretend play in this period.

For the observations in this current thesis, I focused on reliably identifying children's engagement in pretend play (this was the key aim of the body of work); however, I did not record the other types of activities the children were engaged in during the free play sessions. To investigate further if the stable individual differences observed from infancy to early childhood indicate a stability in orientation towards pretence and other playful, imaginative activities, future longitudinal work with adequate sample sizes could also investigate what other activities children engage in during free play. Do relatively low frequency pretenders consistently engage in other types of activities, such as more reality-based activities like running around the setting?

Future longitudinal work could also investigate if the individual differences identified in infancy remain stable into middle, or late childhood, or even into adulthood. Perone and Göncü (2014) discussed the notion of "life-span pretend play" (p. 200), which included adolescents pretending to be wrestlers and adults "playing house" (p. 202). Assessing the stability of individual differences across additional time points past early childhood would help to understand if the individual differences allude to a stable orientation towards pretend activity. Further, are stable individual differences in displaying pretend play associated with other measures noted to show an orientation towards fantasy and imaginative activities, such as children reporting of imaginary friends? Such investigations would help determine if the stable individual differences identified indicate a stable orientation towards imaginative activities over other types of activities.

In using the PPoCS to identify pretend play in the current thesis, each pretend play enactment was coded as a subtype of pretend play (e.g., *pretend action toward self*; *pretend action toward object*; *pretend action toward other*; *object substitution*; *verbal pretend play enactment*)¹⁶, this helped to ensure that all clear examples of observable pretend play were recorded. However, because of the nature of the research questions, and the observational paradigms used, the subtypes of pretend play were not analysed as separate variables and all types of pretend play were conceptualised as valid indicators of children displaying pretend play. It has been suggested that free play sessions (i.e., the paradigm used in the current investigations) may not be suitable for measurement of competence for engaging in different types of pretend play (Belsky, Garduque, & Hrnecir, 1984; Vondra & Belsky, 1991; Kelly-Vance et al., 2002). Nonetheless, as fundamental questions remain around the developmental progression of types of pretend play behaviours (Thompson & Goldstein, 2019), partly because of a lack of longitudinal studies and lack of investigation on representative community samples of children, I presented exploratory findings on the number of children captured as showing the different types of pretend play behaviours at the different time points across Studies 1 and 2. However, caution should be exercised with interpretation of these exploratory findings. Due to the nature of the research questions, reliability across observers was established on children demonstrating any pretend play, and on the frequency of pretend play displayed; but, reliability across observers was not explored for the recording of the specific types of pretend play. The current study followed other longitudinal studies that have similarly used composite *pretend play* variables (e.g., Russell & Raineck, 1981; Zerwas, 2003; Lillard & Kavanaugh, 2014). Similarly, many of the assessment instruments used for

¹⁶ The type of pretend play was explicitly recorded on the transcripts by observational coders when identifying pretend play in the toddlerhood and early childhood assessments, but the type of pretend play was derived from the coded transcripts from the infancy assessment (i.e., observational coders recorded ‘pretend to drink’ on the transcript; the PPoCS includes that ‘pretend to drink’ is a ‘pretend action toward self’, thus type of pretend play was derived as ‘pretend action toward self’).

early screening of autism and social communication delays measure only children's abilities in *pretend play* and not their abilities for specific types of pretend play (e.g., the CHAT; M-CHAT; M-CHAT R/F; SACS 'items').

Possible caution should be taken with interpreting the proportions of children displaying the different types of pretend play at the different time points in comparison to earlier studies. The PPOCS category of *verbal pretend play enactment* includes the enactment: *the child acts on an object with accompanying pretend verbalisations/sounds/noises*. An example of this type of enactment, provided on the PPOCS and observed in Studies 1 and 2, is a child pushing a car along the floor and vocalising engine sound effects, 'vroom, vroom'. If a child simply pushes a car along the floor, the child may be performing an exploratory action, the car has wheels so *affords* movement, there would be no evidence of pretend *play*; but it is the speech/sound effects that fully "creates" the pretend play (Veneziano, 2002, p. 8). For this miniature car example, I conceptualised that the speech is the pretend play enactment (rather than a *pretend action directed toward an object*); thus, the action was included on the PPOCS as a *verbal pretend play enactment* only. However, in some earlier studies, verbal enactments with miniature cars and other toy vehicles have been measured as children showing different types of pretend play. The action of "push car on floor and make car noise" has instead been placed in the category of "pretence behaviour directed away from child toward other", along with items such as "feed doll from spoon" (e.g., Belsky & Most, 1981, p. 632; Tamis-LeMonda & Bornstein, 1991; Gowen et al., 1992). Alternatively, Russell and Raineck (1981) identified that "pushing a car and making an engine noise" was a developmentally early pretend play action, conceptualised as less advanced than pretend actions directed toward self (e.g., pretend to eat); placed within their least complex pretend play type category of "miniature toys are used as if they were their larger functional counterparts" (p. 99).

These discrepancies in how types of pretend play are conceptualised calls for more longitudinal investigation on the developmental progression of the subtypes of pretend play; but such investigation would need to be within a more structured paradigm, not during observation of free play. Within the current body of work, all types of pretend play were considered as valid indicators of *pretend play*, this fitted the aims of the current investigations and importantly, there is agreement across the authors mentioned above that acting on a miniature vehicle with a sound effect is a valid indicator of pretend play (e.g., Belsky & Most, 1981; Russell & Raineck, 1981; Tamis-LeMonda & Bornstein, 1991; Gowen et al., 1992).

There were marked differences in the structure of the free play sessions and the toys available across Study 1 and Study 2; consequently, comparisons across the number of children showing the different types of pretend play across the two studies are limited and cross study findings should be cautiously interpreted. Nonetheless, it is interesting to note the low instances of *object substitution* observed in both the toddlerhood and early childhood assessments and that *pretend actions directed toward self* were shown by over half of the children who engaged in pretend play at all three time points from infancy through to early childhood.

The current investigation was constrained by using existing measures from the CCDS. Because the toddler free play session was conducted in the home environment but the infancy and early childhood assessments took place in the laboratory, I investigated longitudinal change and consistency using data from the infancy and early childhood sessions only; suspecting that displays, including frequency, of pretend play would likely be influenced by the type of setting (e.g., likely more distractions away from pretend play in the home environment, such as the television), the different toys available and different peer play partners (i.e., familiar vs. unfamiliar). These situational factors would likely have introduced

error variability in the longitudinal analysis of change and consistency in displays of pretend play if all three waves of data had been analysed longitudinally. Consequently, Study 1 focused on investigation of the emergence of pretend play in the key toddler period (a key time window previously suggested for the emergence of pretend play) and Study 2 on the infancy and early childhood periods. This structure constrained the analysis I conducted and other approaches and investigations could have been conducted to provide further insights into the development of pretend play. For example, a different structure could have permitted exploration of whether those children not yet showing pretend play in toddlerhood (informant reported in Study 1) were found to engage in a lower frequency of pretend play in early childhood (observationally in Study 2); was there an association with competence for pretend play in toddlerhood and how frequent children engage in pretend play in early childhood? This would be an interesting avenue for future research to explore and may shed light on the construct that is measured when pretend play frequency counts are analysed.

6.3 Theoretical Conclusions

While several theoretical accounts are proposed for how and why pretend play emerges, develops, and appears delayed for some children (see Piaget, 1962; Leslie, 1987; Jarrold, 2003; Rutherford et al., 2007; Lillard et al., 2013; Lillard, 2017) these theoretical accounts lack supporting empirical evidence from large representative community samples of children followed longitudinally; indeed, some theoretical accounts appear to have arisen in the absence of any empirical data on children at all. For a subject to become a science it is necessary to first describe and classify behaviour before theoretical accounts can be formulated (Hinde, 1997); however, it appears that much theorising about the nature of pretend play has taken place before adequate descriptive data is available (i.e., data from large samples of children representative of general populations and studied longitudinally). It

was not the aim of the current thesis to test theoretical accounts on the emergence or nature of pretend play, but rather, the current thesis aimed to improve the evidence base by providing descriptive data about the emergence and development of pretend play over the first three years of life, in a representative community sample of children from the UK studied longitudinally. While it was beyond the scope of the current thesis, the database could be used in future work to test contrasting theories on the emergence and development of pretend play.

While description and mapping of the emergence and development of pretend play was the primary aim of the current body of work, the findings can however provide insights into ongoing theoretical debates within the topic area. The statistical stability shown in Study 2 (Chapter 5) from the early measures of pretend play in infancy (e.g., pretending to drink from an empty cup; pretending to pour from an empty teapot; pretending to eat plastic food; pretending to feed a teddy bear from an empty cup) to the later measures of pretend play in early childhood (e.g., pretending to drink from an empty cup; object substitution; attribution of animacy; role play; and other types of pretend play enactments) provides evidence of measurement of the same psychological construct at the two time points (Cronbach & Meehl, 1955). The findings suggest that early forms of action with miniature picnic set items are part of the same construct as later forms of pretend play. Some actions with miniature replicas such as cups and spoons and play food (e.g., eating from an empty spoon; drinking from an empty cup) have been categorised previously as a child simply showing conventional knowledge of an object and labelled as *functional* play, rather than *pretend* play (e.g., Zelazo & Kearsely, 1980; Ungerer & Sigman, 1981; Laplante et al., 2007). Because of a lack of evidence of “as if” *thinking* on the child’s part, some authors caution against considering these early nonverbal (in the most part) actions with miniature replicas as pretend play (Baron-Cohen, 1987). The current findings however argue against a theoretical separation of

these early forms of action from later more accepted forms of pretend play (e.g., object substitution; verbal attribution of absent properties), for example, as was suggested by Leslie's metarepresentational theory of pretend play (1987). The findings instead support accounts that suggest that early actions, such as eating and drinking in the absence of food and drink portrayed by action alone, are types of pretend play, albeit possibly simple or primitive forms appearing early in development before the appearance of more elaborated and mature forms of pretend play (e.g., as suggested by Piaget's, 1962, theory on the development of play).

It is important to note that these early actions with miniature toy items (e.g., pretending to drink) do not disappear from the pretend play repertoire as children move through the first three years of life. I observed children performing 'drinks' from empty toy cups, 'eating' of plastic food and 'pouring' from empty containers across the three time points studied. Children in the current study engaged in non-verbal forms of these actions in infancy, toddlerhood and early childhood. Observation of a three-year-old child engaging in such actions would likely not be questioned as an observation of pretend play, yet, when the same actions are performed much earlier in development there is some theoretical debate around the status of the behaviours as forms of pretend play. The statistical stability shown in Study 2 provides validity that the early measures of pretend play were part of the same construct as the later measures of pretend play, "if two tests are presumed to measure the same construct, a correlation between them is predicted" (Cronbach & Meehl, 1955, p. 8), and the actions we saw in infancy, were also observed in toddlerhood and early childhood (thus providing face validity that pretend play was observed at all ages). Furthermore, the same playful (ludic) signals, for example, *exaggerated* mouth movements; *exaggerated* head tilts; *elaborated* holds and so on were also observed at all time points (i.e., in infancy, toddlerhood, and early childhood). These observations suggest to me that the children were

signalling playful, non-literal, ‘as-if’, engagement at all time points; however, with age and development more forms of pretend play become available in the child’s pretend play repertoire, e.g., verbal forms of pretend play appear later as children’s verbal skills develop.

While the relative frequency of children’s pretend play has been used as an indicator of pretend play abilities and competence in toddlerhood and early childhood (e.g., Nielsen & Dissanayake, 2000; Lillard & Kavanaugh, 2014), and used to make inferences about children’s developing cognitive maturity and cognitive development (Doyle, Ceschin, Tessier, & Doehring, 1991), it has alternatively been suggested that frequency counts of pretend play actions are actually poor markers of pretend play competence and ability (Rutherford et al., 2007). Instead, frequency counts are theorised to provide a good measure of typical pretend play performance, influenced by children’s motivation or interest to engage in pretend play (Rutherford et al., 2007). The current data provide some support to this latter notion, in terms of frequency counts of pretend play actions observed during free play sessions in the laboratory in the early childhood period, and also possibly during those observed during laboratory sessions in infancy and during free play in the home during toddlerhood. If frequency counts can index pretend play competence (sophistication, ability) and developing cognitive maturity in early childhood, it would have been expected that the oldest children observed during the Early Childhood party in the current study would have engaged in more frequent pretend play than the youngest children observed during the same session. However, I found no significant association with chronological age and children’s frequency of pretend play in this early childhood period (age range = 29 to 41 months). While chronological age is of course a weak marker of cognitive maturity, chronological age in childhood and cognitive ability do often show at least some relationship (e.g., Ocampo, Knight, & Bernal, 1997; Kokis, Macpherson, Toplak, West, & Stanovich, 2002); therefore, if frequency counts in early childhood index advancing pretend play competence and advancing

cognitive maturity we would expect at least some association with chronological age and the frequency of children's pretend play at that point in development. If frequency measures do index pretend play competence and developing cognitive maturity during early childhood (i.e., relatively more frequent pretend play = more competent/advanced pretend play = advanced cognitive maturity), we would expect a continued change (increase) in the frequency of pretend play across time, into and through early childhood. However, as discussed, although frequency of pretend play increased in the current study from one to three years, as has also been shown in previous longitudinal studies (e.g., Russell, 1981; Zerwas, 2003), researchers have reported little change, or even a decrease in frequency of pretend play acts from around the end of the second year into the middle (and end) of the third year (Largo & Howard, 1979; Russell, 1981; Zerwas, 2003). Therefore, while there certainly appears developmental change (increase) in frequency of pretend play over the first two years of life (Largo & Howard, 1979; Russell, 1981; Zerwas, 2003; Kwak et al., 2008; Palacios et al., 2016), it appears this change possibly does not extend in to the third and fourth years of life (Russell & Russnaik, 1981; Zerwas, 2003). The lack of developmental change, or even a decrease, in the frequency of pretend play reported in other studies casts doubt on the use of frequency counts observed during free play sessions in the laboratory (and possibly other settings) as indexes of pretend play competence/sophistication and developing cognitive maturity/cognitive skill in early childhood (Doyle et al., 1991).

Possibly the frequency of pretend play increases (changes) across the first two years of life, as more children become capable of pretend play (and also capable of different types of pretend play) so the *mean* frequency of the group increases; however, after the second year and into the third and fourth years of life as the vast majority of children have now acquired these capacities there maybe is no longer an increase in the mean frequency of pretend play of the group. The data presented in this thesis cannot fully answer these questions, additional

longitudinal studies with representative community samples of children studied from infancy, through toddlerhood, into the third, fourth and fifth years of life are needed to understand the construct of the frequency of pretend play further.

I speculate that frequency counts of pretend play actions observed during free play, especially the frequency of pretend play observed during free play in laboratory settings in early childhood, but also during home observations in toddlerhood, are instead indexing children's motivation and interest in pretend play; possibly indexing a trait of motivation, orientation towards, or interest, in engagement in pretend play, but also probably indexing motivation and interest arising from situational factors, e.g., tiredness, illness at the time of testing. We saw that children's displays of pretend play in the home environment in toddlerhood differed significantly from their competence for pretend play, i.e., fewer children displayed pretend play during the observations than were reported as capable of pretend play by informants, suggesting motivational and interest factors were influencing children's propensity to engage in pretend play. We saw statistical stability in the frequency of pretend play observed in Study 2, from infancy to early childhood, and also stability from engaging in any pretend play in infancy to engaging in more frequent pretend play in early childhood. I suspect this stability can be somewhat attributed to stability in motivation, orientation, preference, or interest towards pretend and imaginary activities, rather than a stability in competence for pretend play. I suspect that possibly some children show an early preference, interest, orientation, or motivation for pretend play and this remains stable across development; an early preference, orientation, interest or motivation in infancy (and possibly in toddlerhood in observations of unstructured play in the home) may be revealed by simply engaging in any 'early' spontaneous pretend play in free play, and later revealed in early childhood as a higher relative frequency of pretend play. The observed stability in the current thesis provides support for Singer's speculation that some children may have more of a

propensity towards engaging in pretend play and other imaginative activities and this propensity may be stable over time (Singer, 1973). However, as discussed, such conclusions are speculative and need further investigation with exploration of associations with children's frequency of pretend play and measures of cognitive maturity; competence measures of pretend play in infancy (e.g., informant reported information); other measures of pretend play frequency at different ages and in different situations and exploration of longitudinal associations with assessments of other imaginative activities (e.g., having imaginary friends in middle childhood). Nonetheless, it was noteworthy that in the current body of work the only measure of pretend play statistically associated with the measure of social adversity was children's capacity to engage in pretend play in toddlerhood, as reported by informants; children who were not yet displaying pretend play had experienced more social adversity by the toddler assessment than children reported to engage in pretend play at least some of the time. As social adversity showed no significant association with the other measures of pretend play, including the observed frequency of pretend play at all time points (i.e., during infancy, toddlerhood, or early childhood), I suspect that measures of children's frequency of pretend play index a different construct to measures of children's pretend play abilities (competence); especially when measured in early childhood.

6.4 Implications

Many of the autism screening instruments that include measurement of pretend play are designed for use with children from 16/18 months of age (e.g., the CHAT, Baron-Cohen et al., 1992,1996; Q-CHAT, Alison et al., 2008; M-CHAT, Robins et al., 2001; M-CHAT R/F; Robins et al., 2009). Similarly, many of the play assessment instruments that assess how the child's pretend play score fits in with age-normed scores as an indicator of the child's overall development expect pretend play to be shown during the second year of life (Westby

Symbolic Play Scale, Westby, 1980; 1991; 2000; RKPPS; Knox, 1997; 2008; ToPP; Lewis & Boucher, 1997). However, the findings in the current body of work suggest caution should be taken before conclusively interpreting a lack of pretend play in the second year as an indicator of developmental delay or later disorder. Of course, it is important to note that the autism screening instruments include assessment of other items aside from assessments of pretend play; however, it is also important to consider that a child need only “fail” three items (out of 20) on the M-CHAT R/F to be considered a “medium risk” for autism. Therefore, it is crucial that all assessed items are investigated for variation within representative community samples of children before inclusion as an indicator of delay. The findings in this body of work are in line with researchers who suggest developmental assessments of pretend play abilities to be included as part of developmental screening *from* 24 months, but not before (e.g., Barbaro & Dissyanke, 2012).

The Early Years Outcomes (2013) document used by practitioners delivering the Early Years Foundation Stage in England, UK, sets out “typical” pretend play behaviours expected to be observed in the age bracket of 16 to 26 months, for example, “gradually able to engage in pretend play with toys” (p. 15). The findings from the literature review in Chapter 2, which suggested a move towards universal emergence of pretend play in the 24 months to 30 months age period, and the findings from Study 1, confirm that the upper end of this age bracket should extend into the third year of life, as it does. Practitioners should be aware of the ‘normal’ variation in pretend play emergence identified in the current study.

The findings have implications for the methods used to carry out these observations of pretend play behaviours in early education settings in England, which are used to inform assessments of how a child is developing, and progressing, within the Early Years Foundation Stage (EYFS). Early years practitioners often carry out direct observation of children’s

behaviours as the child moves freely around the early years setting. The findings presented in this thesis suggest that caution should be exercised before using short, single observations of the child's natural behaviour as the child moves freely around the setting as a method for assessing competence for pretend play; practitioners may instead be identifying individual preferences for pretend activities (which of course may be also useful to identify). However, if practitioners want to assess pretend play competence, the findings from this thesis suggest that possibly providing a more structured activity/situation, such as the presentation of a picnic set for 20 minutes, may be more useful for identifying competence for pretend play. The findings suggest that parents' reports of pretend play competence would likely be a useful addition to teachers' assessments of pretend play gained from direct observation.

If some children do consistently orientate more towards pretend and imaginative activities, as the findings in Study 2 suggest, this has implications for the current debate around the structure of education settings in terms of the equipment and activities available to children and the strategies used to encourage development and learning (Lillard & Taggart, 2019).

6.5 Conclusion

The thesis advanced on much of the previous observational work by investigating displays of pretend play longitudinally, in a community sample of children representative of the wider UK population studied, using a mixture of data collection methods. The studies presented in this thesis further advanced on the existing literature by studying pretend play using a newly developed observational coding scheme that supplied clear evidence of children signalling entering into play, as distinct from simply responding to the affordances of the play object, and thus supplied further evidence for engagement in pretend play. The findings from Study 1 indicate that caution should be exercised with conclusively interpreting an absence of pretend play during the second year as an indicator of later developmental delay or disorder. Study 2 also contributed to our understanding of individual differences in the emergence of

pretend play during the second year of life, being one of the first to confirm that there are stable individual differences in displays of pretend play from around the time of the first birthday into early childhood. In general, the findings from both studies suggest there may be stable individual differences in orientation towards playful and imaginative activities that originate in infancy.

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Appendix A

Pretend play observational coding schemes used in studies of pretend play at 18 months of age and younger: author(s); sample information; methods; observational codes and operational definitions relevant to the current study

Author	N	Age	Design	Duration	Tea set/ picnic type set/ eating utensils included	Procedure and measure details	Reliability Agreement
Barton (2007)	4 DD 4 ND	DD MA range: 18 to 36 months	Intervention study, multiple probe design	8-minute initial probe session	YES	<p>Classroom sessions; Initial probe sessions (un-prompted play; teachers instructed “play as normally would”, p. 50) - followed by teacher pretence instructional sessions</p> <p>Four categories of pretend play behaviours: Functional play with pretense <i>“(Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome)”</i> (p. 41)</p> <ul style="list-style-type: none"> • Picks up cup and stirs spoon in cup • Pours bottle into sippy cup, bowl, or plate • Puts bottle, spoon, or cup to own mouth • Puts spoon to teachers’ mouth • Puts cup to the figures mouth <p>Object substitution Imagining absent objects <i>(Performing an action as if an object was present in the object’s absence)”</i> (p. 41)</p> <ul style="list-style-type: none"> • Puts bottle over cup and says milk • Stirs spoon around bowl and says ‘stirring soup’ <p>Assigning absent attributes (p. 41)</p>	Un-prompted initial probe = 95 -100% agreement

Bates, Benigni, Bretherton Camaioni & Volterra (1979)	25	Between 9.5 to 12.5 months 4 visits	Short-term longitudinal	15- minutes in total	Yes	Home visits; Included play with mother and child, reading a book, and solitary play; Battery of toys provided Play 2. Symbolic Play a. (<i>Pretends, using an object appropriately</i> b. (<i>Uses one object as though it were something else</i>) <ul style="list-style-type: none"> (a.) Talking into a toy telephone (b.) Talking into a spoon as though it were a telephone <p>"If baby places real or artificial food in his mouth, sucks on baby bottle... these acts are not counted"; "If he 'pretend' eats with playful, nonfunctional motions (e.g., saying ahm, scraping fork against toy plate, feeding the observer, this is counted" (p. 139)</p>	Not reported
Belsky, Goode & Most (1980)	32	9, 12, 15, and 18 months	Cross sectional	2 X 45 minutes	N/A	Home visits; Normal routines (naturalistic); Observations recorded on pre-coded checklist 1. Juxtapose 2. Functional "3. Pretend play (<i>Characterized play that involved pretense, or transformed a material so that it could be used in a pretend activity for which it was not originally intended</i>)" (p. 1171) <ul style="list-style-type: none"> "Stirred" with a spoon "Drink" from a seashell, turn a block into a car" ○ Authors cited in relation to coding scheme development: Fein & Apfel (1979); Fenson et al. (1976); McCall (1974); Nicolich (1977) 	Pretend play not reported
Belsky & Most (1981) Belsky, Garduque, &	40	7 ½ to 21 months	Cross sectional	Up to 30 minutes	Yes	Home visit; Standard arrangement of toys; Mother present - no initiation/elaboration 12 levels of exploration/play included:	Ranged from .79 to .98 across 12 levels

Hrncir
(1984):
Sequence
category
modified

6. Enactive naming (*Approximate pretense activity but without confirming evidence of actual pretense behaviour*)

- Touch cup to lip without making drinking sounds, tilting head back, or tipping cup

7. Pretend self (*Pretense behavior directed toward self in which pretense is apparent*)

- Raise cup to lip; tip cup, make drinking sounds, or tilt head

8. Pretend other (*Pretense behavior directed away from child toward other*)

- Feed doll with spoon, bottle, or cup

9. Substitution (*Using a "meaningless" object in a creative or imaginative manner*)

- Drink from seashell

10. Sequence pretend (*Repetition of a single pretense act with minor variation; linking together different pretense schemes*)

- Drink from bottle, give doll drink; pour into cup, pour into plate
- Stir in cup, then drink; put doll in cradle, then kiss goodnight

- Authors cited in relation to coding scheme development: McCall (1974), Weisler and McCall (1976), Fenson et al. (1976) Zelazo (1980), Zelazo and Kearsley '(in press)', and Nicolich (1977)

Brown, Rickards & Bortoli (2001)	20	15 to 30 months (overall study) Only 28, 29, 30 months reported	Longitudinal (three sessions combined for overall highest pretend level) Group comparison (½ participants hearing	10 - 15 minutes typically	YES Inc. a tea-party scenario toy set	Laboratory sessions; Three sets of toys/scenarios; Items placed on picnic mat; Mother present - play as normally would. Spontaneous; imitated; and solicited play coded 10 level pretend play scale included: 1. Pre-symbolic • <i>Closes eyes and pretend sleeps</i> 2. Auto-symbolic • <i>Feeds self with spoon</i> 3. Decentred	.87 lowest for overall pretend play
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			children/ ½ hearing loss)			<ul style="list-style-type: none"> • Feeds doll/partner with empty spoon <p>4. Linear sequence</p> <ul style="list-style-type: none"> • Feeds self & doll in any order ○ Authors cited in relation to coding scheme development: Belsky & Most (1981); Fenson (1984); Fenson & Ramsay (1980); Largo & Howard (1979); Lezine (1973), Lowe (1975); Nicolich (1977); Ogura (1991); Westby (1995) 	
Daunhauer, Coster, Tickle-Degnen, Cermak (2007)	26	Range: 10 to 38 months	“Repeat-measures” (p. 431)	2 x 6 minutes (I) 6 mins (with CG)	YES	Romanian orphanage; Two sets of toys (novel exploratory toys; symbolic toys); Two independent (I) play sessions (one with exploratory toys, one with symbolic toys) followed by play session with Caregiver (CG)	I. Symbolic play weighted Kappa: $M = .74$
						<p>Developmental Play Scale (DPS), 13 levels of Play:</p> <p>7. Pretend self (presymbolic) (<i>Engages in pretend play involving self</i>)</p> <ul style="list-style-type: none"> • Feeds self a doll bottle <p>8. Pretend other (first symbolic stage) (<i>Engages in pretend play not involving self</i>)</p> <ul style="list-style-type: none"> • Feeds doll with doll bottle <p>10. Substitution (<i>Uses object for something other than its overt purpose</i>)</p> <ul style="list-style-type: none"> • Uses a pen as a doll bottle ○ Authors cited in relation to coding scheme development: Belsky & Most (1981); Bornstein et al. (1996); Knox & Mailloux; (1997); McCune (1995), Nicolich (1977); Tamis-LeMonda & Bornstein (1991) 	
DiCarlo & Reid (2004)	5 (DD) 3 (TD)	Range: 14 to 22 months (MA)	Intervention/ Experimental Study; Group Comparison	10 minutes typically	YES	Free-play time in the classroom, Baseline & Responsive teaching program	55-100 % (DD) 70 % (TD)
						<p>“Pretend play was defined as at least a single-step action that appeared to imitate a real-life situation</p>	

		Range: 19 to 25 (TD)				<p>involving objects that corresponded to the toys used in the action” (p.199)</p> <p>Single step pretend toy play:</p> <ul style="list-style-type: none"> • Child appearing to pour a drink into a cup (e.g., tilting a toy pitcher down toward a toy cup) • Stirring a toy spoon in a toy bowl • Talking on a toy telephone • Feeding a doll by placing a toy spoon to the doll’s mouth 	
Dixon & Shore (1991)	30	Range 17.5 to 23 months Seen six weeks later	Longitudinal	1 - 2 minutes per trial	YES	<p>Laboratory session; Nine trials investigating symbolic play - included spontaneous and modelled play conditions in each trial; Mother present - not assist; Included a breakfast scenario; Investigated symbolic styles (“dramatist - versus - patterner”)</p> <p>Variables/coding categories included: Number of pretend actions Variety of pretend actions</p> <p>Pretend breakfast scenario, experimenter instruction: “Pour in the cereal (tilting empty cereal box), pour in the milk (tilting empty pitcher), stir it up (stirring motion in bowl with plastic spoon), mmmgood cereal (eating)”. (p.195)</p>	Majority of measures: 75 - 85%
Dixon & Smith (2003)	40	13 and 20 months (play coded at this age)	Longitudinal	10 minutes	YES	<p>Laboratory session; Mother-child free play; Standard toy set including plate; fork; spoon; plastic fruit; telephone</p> <p>“Hybrid scale” created from (“Bates et al., 1979; Belsky and Most, 1981; Nicolich, 1977; Tamis-LeMonda and Bornstein,1994)” (p.182)</p> <p>Eleven levels of play included:</p> <p>(5) Enactive Naming (<i>Approximate pretense activity but without confirming behavioural or verbal evidence of actual pretense</i>)</p>	Kappa range: 0.70 to 0.89

						<ul style="list-style-type: none"> • Child uses drinking action with empty cup, but without making drinking sounds <p>(6) Pretend-Self (<i>Clear pretense behaviour directed toward the self</i>)</p> <ul style="list-style-type: none"> • Drinking action with accompanying drinking sounds or verbal narrative <p>(7) Pretend-Other (<i>Clear pretense behaviour directed away from the self</i>)</p> <ul style="list-style-type: none"> • Pretends to make baby doll walk <p>(8) Substitution (<i>Using an object to symbolize an object of a different categorical kind</i>)</p> <ul style="list-style-type: none"> • Uses the spoon to scoop up a block and pretends to eat from the spoon <p>Pretend play: Levels 6,7,8</p>	
Ebeling (2011)	32	14 and 24 months	Longitudinal Symbolic play only assessed at 24 months	Mean 7.43 minutes	YES	<p>Home visit; Three sets of toys in bags; Mother play with children - order of bags standardised; Time division per bag set by Mother</p> <p>Types of pretend play included:</p> <p>(1) Self (<i>Actor pretends to do something they do in real life. Pretense is directed toward the self and/ or focused on the self</i>)</p> <ul style="list-style-type: none"> • Pretend eating accompanied by chewing motions and/or sound effects <p>(2) Other (<i>Actor pretends to do something s/he does not do in real life. Pretense is extended beyond the self by involving others or pretending to perform actions one does not perform</i>)</p> <ul style="list-style-type: none"> • Child feeds their mother <p>(3) Combinatorial (<i>Actor performs same sequence with different objects. Actor uses an object in two or more ways. Actor uses the items in a necessary order</i>)</p> <ul style="list-style-type: none"> • Actor feeds a hippo, then a giraffe • Actor feeds themselves then the other <p>(4) Substitutional-pretend</p>	.93 (Self) .88 (Other) .68(Combinatorial)

(5) Object as Active Agent

Farver & Howes (1993)	60	18, 24, 36 months	Cross sectional Cross cultural	20 minutes	No-wooden shapes/figures	Home observations; Bag of wooden shapes (human figure/animal figure/shapes etc.); Mother present - play as like Level of play with objects (4 levels) Level 3) “Symbolic play was coded when children used the shapes to represent other objects or activities, and included conventional or functional uses of the shapes, such a giving a horse shape a “ride” on the train, object substitution (using a block for a bed), and the use of independent agent (making the human shapes walk and talk)” (p. 350)	Cohens Kappa range: .82 to .96
Fein (1974)	16 ch. at each age	12 and 18 months	Repeated measures design Cross sectional	60 minutes total 2 x visits 10 minutes each episode	YES	Home visits; 3 episodes (Alone/Mother/Alone); 50 toys/objects; Standard arrangement Actions coded as “pretend” if: (1) Involved treating an inanimate object as if it were animate <ul style="list-style-type: none"> • Feeding a doll (2) Resembled functional activities but occurred in the absence of necessary materials <ul style="list-style-type: none"> • Stirring, pouring, drinking, or spooning "food" out of empty cup (3) Were not carried through to their usual outcome (4) Were typically performed by others <ul style="list-style-type: none"> • Brushing own or other's hair 	Not reported
Fenson (1978)	19	9.5, 13.5, and 18.5 months	Longitudinal	7 minutes	YES	Solitary pretend play; Tea-set was the only toy; Mother present but no initiation Seven play types coded included: (2) Mouthing (<i>Tasting or chewing on an object, where pretending to eat was not clearly implied</i>)	

							(6) Symbolic acts (<i>Any act involving pretending, including eating, drinking, stirring, pouring, or spooning (i.e., transferring imaginary substance from a container to the mouth or from one container to another)</i>)	
Fenson, Kagan, Kearsley & Zelazo (1976)	57	Mean 7.7 Mean 9.7 Mean 13.6 Mean 20.4 (Months)	Cross-sectional (four age groups)	Mean 8 minutes	YES	Laboratory; Mother present - but not initiate; Tea-set presented Three types of play : Relational acts Symbolic acts <ul style="list-style-type: none"> Included eating (but not mouthing or chewing), drinking, pouring, stirring, and spooning (presumably imaginary substance) Sequential acts	Not reported	
Fiese (1990)	57	Mean 20 months (15 to 24 months range)	Group comparison	24 minutes total	YES (Play dishes)	Laboratory session; Toy set in standard arrangement; Four play conditions (Alone/ Mother/ Modelled/Mother post modelling) Eight play categories included: (1) No play behavior (4) Functional play (Toys are used in a functionally expected way) <ul style="list-style-type: none"> Car is rolled (5) Single scheme representational play (<i>Child uses one pretend scheme</i>) <ul style="list-style-type: none"> Drinking from an empty cup (6) Combinatorial representational play (<i>Two pretend schemes are related to each other</i>) <ul style="list-style-type: none"> Pouring and drinking from an empty cup <ul style="list-style-type: none"> Authors cited in relation to coding scheme development: Fenson et al. (1976); Fenson & Ramsay (1980); Largo & Howard (1979); Nicolich (1977) 	Child Play .69	

Gowen, Johnson-Martin, Goldman & Hussey (1992)	40	6, 11, 15 & 27 months	Longitudinal & Comparison	20 minutes	YES	<p>Laboratory session; Playroom equipped with same set of toys at each visit; Mother present - play as normally would</p> <p>16 Categories for coding object involvement included:</p> <p>Pretend self (Level 8) (<i>Pretense behaviour directed towards self</i>)</p> <ul style="list-style-type: none"> • Raises cup to lip and makes drinking sounds; puts phone receiver to ear and vocalises <p>Pretend other (Level 9) (<i>Pretense behaviour directed towards another being or object</i>)</p> <ul style="list-style-type: none"> • Feeds doll with toy baby bottle or cup; pushes truck on floor and makes a truck noise <p>Substitution (Level 10) (<i>Pretend play in which an object is transformed into something else</i>)</p> <ul style="list-style-type: none"> • Uses block to brush hair <ul style="list-style-type: none"> ○ Authors cited in relation to coding scheme development: Belsky, Garduque, & Hrncir (1984); Belsky & Most (1981); Fenson & Ramsay (1980); Nicolich (1977) 	Mean .90 for frequency scores
Haight & Miller (1993)	9	12,24,36 and 48 months	Longitudinal	3 to 4 hours	N/A	<p>Naturalistic observations</p> <p>Overall definition of pretend play: “A subcategory of play in which actions, objects, persons, places, or other aspects of the here and now are transformed or treated nonliterally” (p. 20)</p> <p>Many examples (and exclusions) provided in text form (not as a coding scheme, just describing what the authors did)</p> <ul style="list-style-type: none"> • Putting a cup to doll’s mouth and saying, “mm good” • Using a toy spoon to “eat” the biscuit 	
Jackowitz & Watson (1980)	48	15.96 months	Cross sectional (two age groups)	2 X 3 minutes	YES	<p>Laboratory session; Toys present when children arrived, then only the toy used in modelling left in the room; Mother present - not initiate; Included a modelled phase prior to free play - "OK, now</p>	98%

23.33
months

you can pretend to talk into the telephone (drink from the cup), and I'll be right back." No experimenter present during free play session (p.546)

Pass or fail - **"Pretending to talk into the telephone or drink from the cup"** (p. 546)

"Required to produce some vocalization or sounds and to specifically hold and move the object as a prototype" (Jackowitz & Watson, 1980, p. 546)

Jeffrey & McConkey (1976)	19	Between 18 and 41 months		5-minute free play	YES	<p>Classroom sessions; Three sessions (1. realistic toys; 2.doll+junk materials; 3. junk materials); Encourage-Model-Free play</p> <p>Observation scheme for recording children's imaginative doll play:</p> <p>Actions coded as either Imaginative or Behavioural actions</p> <p>18 Imaginative "verbs used in recording" (p.189), includes:</p> <p>Feeds (<i>The act of giving the doll 'food' or 'drink'</i>) Sits (<i>Making the doll sit in an appropriate manner</i>) Spoons (<i>Stirring action associated with feeding or the lifting of a substance with a 'spoon'</i>)</p> <p>8 Behavioural verbs e.g.,</p> <p>Puts down (<i>Object is placed on the ground</i>)</p>	Type of action 90%-93% agreement
Largo & Howard (1979)	85	9,12,15, 18,21,24, 27 and 30 months	Cross sectional	25 minutes	YES	<p>Laboratory; Standardised sequence - 12 sets of toys presented (no instruction - but prompting later); Mother present - not prompt</p> <p>Four categories of play behaviour (16 specific behaviours)</p>	Overall 0.91

(B) Play behavior with functional characteristics

Functional play (*The object is used in a functionally appropriate way and the play is restricted to the child's own body*)

- The child feeds himself with a spoon

Representational play (*The object again is used in a functionally appropriate way, but with the play directed toward the doll or another person*)

- The child feeds the doll with a spoon

Symbolic play (*An object is symbolically substituted for an absent one*)

- The child substitutes the stove for a car

Lewis & Ramsay (2004)	66	15, 18, 21, and 24 months	Longitudinal	6-minute total	YES	Laboratory; Toy set in standard arrangement on the floor; Mother present - no prompt; Free play - modelling - free play Three pretend play activities coded: 1 = Feeding the self or the doll with the spoon 2 = Talking on the telephone by holding the receiver to the self or the doll's ear 3 = Giving the self or the doll a drink from the glass Coded as: (a) Exclusively self-directed (b) Mixture of self- and other-directed	.86 presence or absence of play
Lowe (1975)	244	12, 15, 18, 21, 24, 30 and 36 months	Cross sectional	Up to 30 minutes (Inc. warm up)	YES	Four toy sets; Toy sets presented in standard arrangement on the table; Mother present; Lowe (1975) notes that full coding scheme not described in the paper Coding descriptions for each set of toys included (Representational play): Situation I:	Not reported

4 - Feeds self (with spoon, or "drinks" from cup)

6 - Feeds other person

8 - Feeds doll

Situation III

2 - Feeds self

3 - Feeds doll

4 - Implied or overt doll feeding

Note: "Great care was taken, therefore, to define each item in an objective manner. In the following presentation the items are explained, but not fully described for reasons of space." Lowe (1975, p. 36)

Malone (1997)	22 DD	MA range: 10 to 43 months (Time 1)	Longitudinal	20 minutes	YES	Home visits; Standard toy set	.89 Time 1
Five categorical play variables:							
Nonplay							
Exploration							
Functional							
Construction							
Pretend (<i>Child plays with toys in a make-believe manner; an element of pretense, role taking, or representation is introduced into the play</i>) (p. 50)							
Marjanovič-Umek & Fekonja-Peklaj (2017)	99	1 to 5 years (29 1-year-old Ch.)	Cross-sectional	At least 30 minutes	YES	Home visits; Toy set provided to the child; Own toys not present; Parent and child play as usually would	.94 for symbolic category
Scale for Observing Child-Adult Play							
Rating scale: "0 (<i>the behaviour described was never displayed</i>) to 5 (<i>the behaviour was very frequently displayed</i>)"							
Symbolic transformations (<i>Object transformations, imaginary situations, use of Metalanguage, taking on roles</i>): <i>Plays as if the toy is a real person, object, or animal: illustrates this verbally; Plays</i>							

as if the toy is a real person, object, or animal: does not illustrate this verbally; Transforms a toy by naming the transformation; Creates an imaginary situation; Names the role he or she takes on; Speaks in the role he or she takes on; Adopts the role's speech register; Asks a parent to take on the role; Plays without a toy; only uses language or gestures

Additionally, non-symbolic items:

e.g., Observes parent's play behaviour

McCune (1995)	102 & 10	6 Ch at each age from 8 and 24 months 8 to 10 months at the start of the study- until at least 24 months	Cross sectional & Longitudinal	10 minutes with no interrupt	Yes	Home visits; Toys arranged on/around a bucket on the floor; Mother present - not initiate, respond naturally Five levels of Representational Play : Level 1: Presymbolic Play Schemes (<i>The child recognizes the function of an object by use</i>) <ul style="list-style-type: none"> • Touching a cup to lips Level 2: Self-Pretend (Autosymbolic Schemes) (<i>The child pretends at self-related activities, such as eating, drinking, sleeping, or grooming, while showing by elaborations such as sound effects, affect, and gesture an awareness of the pretend aspects of the behaviour</i>) Symbolic Stage I Level 3: Other-Pretend (Decentred Symbolic Play) (<i>The child extends pretending beyond the self</i>) <ul style="list-style-type: none"> • Reading • Feed doll Level 4: Combinatorial Pretend Level 5: Hierarchical Pretend	.85 for a sample of 100 acts.
<p>Note: McCune (1995) additionally referred to, "Sound effects and exaggerated gestures (such as throwing the head back to drink deeply)" within the text of the article (p. 199)</p>							

McInnes & Elpidoforou (2018)	50	0 to 3 years of age	Mixed method	30 minutes	N/A	<p>Naturalistic play session in a museum</p> <p>Toddler's Play in Museums Taxonomy (To.P.Mu.T.)</p> <p>14 categories of play:</p> <p>Imaginative Play (<i>Children play the role of an object or a being that is a part of our reality but is not physically present or is impossible to happen</i>)</p> <ul style="list-style-type: none"> • Pretending to be a tree <p>Symbolic Play (<i>The use of symbols to replace objects feelings-thoughts-beings that are not there or obvious</i>)</p> <ul style="list-style-type: none"> • Holding a brush as a telephone <p>Pretend Play (<i>Children engage in representations of everyday life. Play out incidents of their social life</i>)</p> <ul style="list-style-type: none"> • Pretend to phone someone or, • Eat food or, • Repeat what the teacher said in school <p>Role Play (<i>Children pretend to be someone else. They experience the feeling of being with different identity and try future roles of their lives</i>)</p> <ul style="list-style-type: none"> • Playing archetypes, such as the role of the mother, teacher, baby, soldier 	Not analysed statistically
Nicolich (1977)	5	Onset age range 14 to 19 months	Longitudinal	Not noted	YES	<p>Home visits; Set of 36 toys protruding from bucket in similar configuration; Mother present - not initiate, respond naturally</p> <p>Five symbolic play levels (with sub categories) included:</p> <p>1. Presymbolic Scheme</p> <p>2. Auto-symbolic Scheme (<i>The child pretends at self-related activities</i>)</p> <ul style="list-style-type: none"> • The child simulates drinking from a toy baby bottle • The child eats from an empty spoon <p>3. Single- scheme symbolic games</p>	Specific reliability not reported

						<p>A. Including other actors or receivers of action, such as doll or Mother</p> <ul style="list-style-type: none"> • Child feeds Mother or doll <p>B. Pretending at activities of other people or objects</p> <p>4. Combinatorial symbolic games</p> <p>4.1. Single scheme combinations</p> <ul style="list-style-type: none"> • Child drinks from the bottle, feeds doll from bottle. • Child puts an empty cup to Mother's mouth, then experimenter, and self <p>Continues to 5.2</p>	
Ogura (1991)	4	Range 0.7 to 0.11 months at the start of the study	Longitudinal (every three weeks) (19 or 20 home visits per child)	15 minutes at each visit	YES	<p>Home visits; Free play with toy set; Caregiver present - not initiate</p> <p>Fourteen levels/sub levels of play: Ranged from Simple manipulation (<i>Indiscriminate mouthing of materials</i>) up to Planned play (Planning the act prior to performance....)</p> <p>Conventional naming act (<i>Conventional usage</i>)</p> <ul style="list-style-type: none"> • Eats with a spoon <p>Symbolic play - Pretend self-play (<i>Pretence behaviour directed toward self</i>)</p> <ul style="list-style-type: none"> • Pretends to drink <p>Symbolic play - Pretend other-play (<i>Pretence behaviour directed toward other person/ Pretence behaviour directed toward doll</i>)</p> <ul style="list-style-type: none"> • Feeds mother with a spoon • Feeds doll with a spoon <p>Combinatorial symbolic play</p> <p>Combinations of single scheme (<i>Repetition of a single pretence act to a series of agents or patients</i>)</p> <ul style="list-style-type: none"> • Drinks from a bottle and then brings it to doll's mouth as if to feed them <p>Multischeme combinations (<i>Linking together different pretence schemes</i>)</p> <ul style="list-style-type: none"> • Stirs in a cup with a spoon and then drinks from the cup 	80.2% - 93.3%

						<ul style="list-style-type: none"> ○ Authors cited in relation to coding scheme development: Belsky & Most (1981) and Fenson et al. (1976) 	
Orr & Geva (2015)	14	6 to 18 months	Longitudinal (bi-weekly)	Set by baby	YES	<p>Home visits; 50 objects presented to infant; Duration of play session/duration with each item set by the baby; Mothers present - instructed not to demonstrate;</p> <p>Four symbolic actions coded:</p> <ol style="list-style-type: none"> 1. Single-object play (<i>The baby holds a single object and performs a single pretend action that is directed deliberately toward himself or herself or toward the mother</i>) <ul style="list-style-type: none"> • Placing a bowl on his or her head 2. Single-object sequences 3. Multi-object play 4. Multi-object sequences (<i>The infant uses several objects to perform several pretend actions</i>) <ul style="list-style-type: none"> • Placing several objects into a pot, stirring and then close the pot with a cover 	.90
Pierce (2009)	48(TD) 25(DD) 48 (Autism)	Between 18 to 24 months	Group comparison	30 - 40 minutes	YES	<p>Existing videos from the "Behavior Samples from the Communication and Symbolic Behavior Scales (Wetherby & Prizant, 2002)" (p. viii)</p> <p>"The clinician was instructed to allow the child to play spontaneously with the items before modelling any play actions" (p. 33)</p> <p>Functional & Symbolic (<i>Actions are based on conventional or standard use of the objects</i>)</p> <ul style="list-style-type: none"> • Pours - container is held so that liquid could flow from the container to the receptacle in a stream. The container may not make repeated contact with the receptacle and nipple of bottle may not push against bowl. • Scoops - utensil is held with proper orientation (by the handle) and enters container with a downward motion 	Functional and symbolic actions: 86% agreement

that may be followed by horizontal motion before lifting from container in an upward motion.

- Stirs - the spoon or other utensil must rotate (with or without wrist rotation) within a container & the utensil must be held in the proper orientation.
- Drinks/ Gives other drink – 1) container is held in the proper orientation, AND 2) a sucking or drinking motion is observed, AND 3) the action is discrete and time-limited, or the container is observed to tip up.
- Eats/ Feeds other - object is held in proper orientation (by handle) and enters mouth in proper orientation (right side up and from the front). The action is time-limited & discrete per bite (≤ 2 seconds); child may not bite utensil. (Pierce, 2009, p. 83)

Rosenblatt (1977)	20	9 to 24 months	Longitudinal	10	Unclear	Home observations Six Categories of play: 3. Representational: single toy (<i>Use of toy as if it were the real object</i>) <ul style="list-style-type: none"> • Dialling the telephone • Brushing own hair • Eating with a spoon 6. Double knowledge (<i>Transcending the meaning of one object to use it as another</i>) <ul style="list-style-type: none"> • Using the flannel as doll's nappy, pushing brick as a car 	Not reported
Russell & Russnaik (1981) + Russell (1981) first category instead	25	(1) Mean 12.8 months (2) Mean 20.5 months	Longitudinal	15 minutes at both time points	Partly (tin, rolling pin, spoon)	Laboratory session; Standard arrangement of toy set on the floor; Mother present - play as normal; Mother-child free play Nine types of symbolic play included: 1. Miniaturization alone (<i>Miniature toys are used as if they were their larger functional counterparts, with no further symbolic play elaboration accompanying the miniaturization</i>)	Conservative measure= 79%.

termed: **Toy replica use alone** (+ only 7 levels included)

- Pushing a car and making an engine noise
- 2. Self-related behaviours** (*The subject pretends to feed herself using miniature dishes, etc, or pretends to carry out a physical activity, such as sleeping or blowing her nose, out of context*)
- 3. Passive animate partner** (*Activities are performed in which an inanimate toy, used as if it were animate, acts as a passive partner to the subject*)
 - Hugging a doll and saying, "Nice baby," without further elaboration
- 4. Active animate partner** (*Activities are performed in which an inanimate toy, used as if it were animate, is an active partner in the subject's activities but does not "speak" or carry out other independent "actions"*)
 - Dolls are fed lunch, put to sleep, or taken for a ride in the car
- 7. Imaginary substitutions** (*Acting as if an imaginary person, object, or substance were present and real, without using stimulus objects as necessary props*)
 - Talking to an imaginary person or eating an imaginary substance from an imaginary spoon. Does not include actions such as eating imaginary food from a real spoon
- 8. Verbal substitutions**

○ Authors cited in relation to coding scheme development: El'Konin (1966); Fein (1975); Garvey & Berndt; Inhelder, Lezine, Sinclair, & Stambak (1972); Lowe (1975); Watson & Fischer (1977)

Shimada, Kai & Sano (1981)	18	12 to 24 months	Longitudinal	15 minutes (five minutes per toy set)	YES	Laboratory session; Three toy sets, standard arrangement of the floor; Mother present - no initiation;	Not reported
2. Types of Representation (1) Material representation i. imitative use of objects <i>(Manipulation of objects according to their appropriate usage)</i> <ul style="list-style-type: none"> • Eating from a rice bowl 							

3. Types of Agent Use

(1) Self (*Symbolic play directed towards the subject himself or herself*)

- Drinking from a cup

(2) Passive other (*Symbolic play directed towards the mother, the experimenter or the doll as if to treat them as mere recipients of his or her acts*)

- Bringing a cup close to the others' mouths as if to feed them

(3) Active other (*Symbolic play directed towards the mother, the experimenter or the doll as if to have them actually participate in the acts*)

- Having the doll walk, handing a cup to the mother or the experimenter and asking them to drink by gestures or verbally, or trying to have the doll hold a cup and drink from it

4. Types of Elaborated Acts

(1) Unordered multi-scheme combination (*Combining 2 different acts in temporal sequence but not in logical order*)

- Pouring from a cup....and then drinking from the cup

(2) Ordered multi-scheme combination (*Combining 2 different acts in logical order as well as in temporal sequence*)

- Stirring in a cup with a spoon and then drinking from the cup

Measured (3) Total number of different acts

Spencer & Meadow-Orlans (1996)	45	9, 12, 18 months of age	Longitudinal Comparison	15 - 20 minutes (age depend.)	Laboratory; Mother-infant dyad play; Free play with toy set; Mothers asked to play "as naturally as possible" (p. 3179) Three major levels of play and subcategories included: Simple representational play (<i>Single acts of pretense with realistic toys</i>) Substitution of one object for perceptually dissimilar one (<i>Could be verbally announced or could be inferred from nonverbal</i>)	Frequency of play acts mean of 84% agree
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evidence including use of the substitute object for several actions or an indication that the infant considered the action to be funny)

Authors cited in relation to coding scheme: development: McCune-Nicolich (1983); Belsky and Most (1981) and Fenson and Ramsay (1980)

<p>Tamis-LeMonda & Bornstein (1991) + Bornstein, et al. (1996); Suizzo & Bornstein (2006); + others, with some different examples, e.g., “drinking from empty cup” for category 5</p>	<p>45</p>	<p>13 and 20 months</p>	<p>Longitudinal</p>	<p>15 minutes at each age</p>	<p>YES</p>	<p>Home visits; Toy set placed on floor; Mother present - behave as ordinarily would (research investigating Toddler and Mother play)</p> <p>Eight levels of play in general included:</p> <p>4. Transition of play (<i>Approximate of pretense but without confirmatory evidence</i>)</p> <p>5. Self - directed pretense (<i>Clear pretense activity directed toward self</i>)</p> <ul style="list-style-type: none"> • Eat from spoon or cup <p>6. Other - directed pretense (<i>Clear pretense activity directed towards other</i>)</p> <ul style="list-style-type: none"> • Kiss or hug doll <p>7. Sequential pretense (<i>Link two or more pretense actions</i>)</p> <p>8. Substitution Pretense (<i>Pretend activity involving one or more object substitutions</i>)</p> <p>Level 5 to 8 = symbolic play</p>	<p>For each of the play levels averaged 97% (range = 96%-99%)</p>
<p>Tomasello, Striano & Rochat (1999)</p>	<p>44</p>	<p>18, 26, 35-month-olds</p>	<p>Cross sectional</p>	<p>6-minute total play time</p>	<p>Toy spoon only</p>	<p>Laboratory setting; Two sets of pretend toys; Freeplay-Demonstration-Freeplay-Verbal (phases) - repeat with second toy set.</p> <p>“Main operationalizations of the symbolic acts were particular acts defined ahead of time” (p. 577)</p> <p>Spoon to doll Brush to doll Car to road Car under tunnel</p>	<p>100%</p>

Ungerer, Zelazo, Kearsley & O'Leary (1981)	61	18, 22, 26, 34 months	Cross sectional	16 minutes in total Two X 8 minutes each	YES	Laboratory ; 31 item toy set; Preetermined order of toys; Primary caregiver in the room; Free play- Modelled session - Free play; "Play acts not accompanied by speech or some type of meaningful vocalization (e.g., drinking sounds) also were excluded" (p. 190) Four categories (in reference to symbolic play) 1. High physical support with action <ul style="list-style-type: none"> The child picks up a teacup, says "Tea," and then proceeds to drink from the cup while making drinking sounds 2. High physical support without action <ul style="list-style-type: none"> The child picks up a teacup, shows it to her mother with a smile, and says, "Tea." 3. Low physical support with action <ul style="list-style-type: none"> The child makes combing motions with a baby bottle while saying, "I comb hair." 4. Low physical support without action	Ranged from .67 to 1.00 (median = .88).
Watson & Fischer (1977)	36	Means 14.0, 19.4 & 24.2 months	Cross sectional	8 minutes free play	Cup only	Laboratory; Six toys on floor - standard semicircle arrangement; Mother present - not initiate; Included a modelled phase prior to free play The type of Action and Object use was coded for each pretend instance: Action - Eating, sleeping, washing, or miscellaneous Object - Self <ul style="list-style-type: none"> The infant puts his head on a pillow to pretend to go to sleep Passive other, Passive substitute, and Active other Passive (<i>Treated the object as a mere recipient</i>) <ul style="list-style-type: none"> Fed the doll by merely stuffing food into its mouth Active (<i>Treated the object as if it had its own will</i>)	Eating action .88 Active other agent use .81 Others .92 and .99

- Had the doll eat, comment on its food, try to hold the cup

Note: "A more detailed description of the scoring procedure can be obtained from the authors" (p. 831)

Wolf & Grollman (1982)	4	1.5 to 4.5 years old	Longitudinal	<p>Wide variety of contexts: free play included</p> <p>Levels of narrative organisation in sociodramatic play included:</p> <p>Scheme level: <i>(Single actions or brief series of actions which re-enact)</i></p> <ul style="list-style-type: none"> • Child holds a spoon to a dolls's mouth as if feeding her <p>Event scripts level <i>(Two to three different schemes, aimed at achieveing a particular goal)</i></p> <ul style="list-style-type: none"> • The child pours 'coffee' and offers to mother
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Note. TD = Typically Developing, ND = Non-Disabled, DD = Developmental Delay, D = Disabled sample, MA = Mental age

Appendix B

Observational coding schemes used for identifying functional play at 18 months of age and younger: author(s); sample information; methods; observational codes and operational definitions relevant to the current study

Author	N	Age	Design	Duration	Tea set/ picnic set Included	Procedure and Measure details	Reliability Agreement
Baranek et al. (2005)	32	9 to 12 months	Group comparison	10 minutes	Not noted	Videotapes from parents filming home activities; "Various special events (e.g., birthdays) and daily occupations (e.g., bath time)" (p.23)	77% -100%
+ Wilson et al. (2017): all levels of functional play and symbolic play combined into one variable	11 TD 11 Autism 10 DD					<p>Four object play categories included:</p> <p>(c) Functional/Conventional Use of Objects in Play</p> <p>Level 5: Object-directed (<i>Actions are directed toward an object</i>)</p> <ul style="list-style-type: none"> • Placing a lid on a pot; dumping objects from a truck <p>Level 6: Self-directed (<i>Familiar actions are directed toward the self</i>)</p> <ul style="list-style-type: none"> • Drinking from an empty cup; raising phone to ear and vocalizing <p>Level 7: Doll-directed (<i>Familiar actions are directed toward doll figures</i>)</p> <ul style="list-style-type: none"> • Feeding a doll with a spoon <p>Level 8: Other-directed (<i>Familiar actions are directed toward other persons</i>)</p> <ul style="list-style-type: none"> • Extending a teacup to a person's lips <p>(d) Symbolic Use of Objects in Play</p> <p>Level 9: Object substitution</p> <p>Level 10: Agent play</p>	Average: 87%

Level 11: Imaginary play (*Properties are assigned to objects as if they are real; Involves an imaginary object in play; References an object as if it were present*)

- Claiming a toy stove is “hot”
- Authors cited in relation to coding scheme development: Belsky & Most (1981); Casby, (1992); Knox (1997); Libby et al. (1998); Lifter et al. (1993); McCune-Nicolich & Bruskin (1982)

Ungerer & Sigman (1981)	16 Autism	MA Range 18 to 38 months	16 minutes	YES
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Laboratory room; Spontaneous play; Predetermined order of toys; Thirty-one item toy set; Modelled session to start; Solitary play, Mother present - no initiation

Four **play** categories, with sub-categories included:

3. Functional play

Self-directed acts

- Brushing one's hair

Doll-directed acts

- Feeding a doll with a spoon

Other-directed acts

- Holding a telephone receiver to the mother's ear

Object-directed acts

- Placing the top on the teapot or pushing the truck into the garage

4. Symbolic play

The use of one object as if it were a different object

- Using a teacup as a telephone receiver

Agent play (*The use of a doll as an independent agent of action*)

- Propping a bottle in a doll's arms as if it could feed itself

Imaginary play (*The creation of objects or people having no physical representation in the immediate environment*)

- Making pouring sounds as imaginary tea is poured from a teapot into a cup

Williams, Reddy & Costall (2001)	45 15 TD	TD Mean 16.6 months	Group comparison	15 minutes- 10 minutes analysed	YES	Home visits; Standard toy set in random in front of the child on the floor; Mother present - not instruct or demonstrate Simple functional play - Functional use of single object (<i>The child acts on an object in a manner that reflects it's "proper" conventional use</i>) <ul style="list-style-type: none"> • Toy cup to the mouth Elaborated functional play - Functional use of multiple objects (<i>The child uses two or more objects appropriately together accompanied by a clear supporting gesture</i>) <ul style="list-style-type: none"> • Tipping a jug over a cup, as if pouring something into it Elaborated functional play - Functional act supported by appropriate vocalization/gesture (<i>The child acts on an object in a manner that reflects its "proper" conventional use and accompanies this with an appropriate vocalization or <u>exaggerated gesture</u></i>) <ul style="list-style-type: none"> • Making slurping noises while drinking from a baby bottle • Drinking from a cup and throwing head back in an exaggerated drinking gesture ○ Authors cited in relation to coding scheme development: Baron-Cohen (1987); Nicolich (1977); Ungerer & Sigman (1981) 	.79 - .91
Zelazo & Kearsley (1980)	64	9½, 11½, 13½, and 15½ months	Cross sectional	15 minutes	YES	Laboratory; 28 toys standard semi-circle arrangement on the floor; Mother present - no initiation - respond naturally Three types of play coded; Stereotypical play; Relational play; Functional play: Functional play: <ul style="list-style-type: none"> • Cover on pot • Stir spoon in cup/pot • Pour from pot to cup • Drink from cup 	Not specified

- Drinking sounds
- Offer drink from cup to mother/doll
- Set cup in saucer

Note. TD = Typically Developing, ND = Non-Disabled, DD = Developmental Delay, D = Disabled sample, MA = Mental age

Appendix C

The Pretend Play Observational Coding Scheme - Toddler module (PPoCS-T): Manual Provided to Coders

- ❖ Observational coding scheme for coding pretend play from video records of Wave 4 20-minute free play session with peer. **Code only the focal child (only record the peers pretend play actions if part of a cooperative pretend play episode with the participant).**
- ❖ The Wave 4 PICS **transcripts** can be used to identify the focal child and for information about when the free play session begins. This may not be the start of the video. Code the free play actions for 20 minutes. Do not record actions after the 20 minutes.
- ❖ Document to use: Wave 4 Pretend Play (Free Play) coding template. (Replace the word 'template' with the participant ID number).
- ❖ The coder should transcribe a description of the observed pretend play action and include, if possible, the pretend play enactment italicised in Table 4 e.g., "Raises cup to mouth and *Pretend to drink (recorded in bold)*.
 - ✓ The coder should record the time the action starts, e.g., for the drink example above, this would be when the child begins to raise the cup to mouth.
 - ✓ The coder should code the type of pretend play observed (detailed below, in Table 1) and record using the correct abbreviation, e.g. SP; O; OP; OS; V
 - ✓ The coder should award a rating to the action using the 0, 1, 2 rating scale described in Table 2.
- ❖ Each pretend play action is transcribed separately (each time noted), even if the actions appear in sequence.
- ❖ **Example of coding shown in Table 3.**

Table 1.

Pretend Play Codes (the pretend play action can be coded as more than one type of pretend play).

Pretend Play Code	Operational Definition
Pretend action toward self (SP)	Pretend action directed towards self/own body (e.g., pretend to drink; pretend to eat; pretend to talk on the telephone) OR Pretend enactment of self-related familiar activity (e.g., pretend to sleep)
Pretend action towards object (O)	Pretend action directed towards object (e.g., pretend to pour; pretend to season; pretend to stir)
Pretend action towards other (OP)	Pretend action directed towards parent, sibling, peer, inanimate object (e.g., teddy bear, doll)
Object substitution (OS)	Transforms one object into a different object “The use of one object as if it were a different object” (Ungerer & Sigman,1981, p. 324) One object stands in for another object (Olson & Campbell, 1988) Can include transforming body part into an object. (Defined in Table 4 in more detail)
Verbal pretend play enactment (V) Verbally attributes absent properties Verbal statement of pretend activity Acts on object with verbalisations; sound effects (V)	Pretend Speech (SP: abbreviation for speech) can accompany the actions described in Table 4 and can help the coder to define an action as pretend play. This speech should be transcribed. If the speech supports, confirms, or accompanies a defined pretend play action record with the pretend play action observation, e.g. Pretends to drink and SP, “Yum!” or Pretend offer tea to peer, SP, “Here’s tea”. The (V) code can be added to the type of pretend play, in addition to the SP; O; OP; OS code. Sometimes the child may use speech while acting in a way that cannot explicitly be defined as pretend play, e.g., placing food in the oven and looking at the oven could be defined as ‘cooking’ but it is hard to operationally define this. The child may attribute a property to such a situation, or alternatively to an object, using a playful or exaggerated tone e.g., “It’s ready!”; “It’s coming!” Alternatively, the child may vocalise a verbal statement of pretend activity, e.g., “I cooks”! but with no other obvious or clear pretend play action. Record such speech as a pretend play action with the time of the action and include a description of what the child is doing to accompany the pretend speech e.g., Places food in the oven and SP, “It’s coming!”. Code as (V) and assign a 0, 1, 2 code. Exaggerated/playful tone of voice (Howe et al., 1998) indicates play enactment and helps with coding as pretend play (Defined in Table 4 in more detail) * Extended on Early Childhood Module

Table 2.

Rating scale for coding pretend play enactments.

Coder Rating	Rating definition
0	The coder does not observe the action to fit the coding definitions for pretend play.
1	The coder is unsure whether an observed action is a pretend play action. An act of possible pretend play. Possible pretend play acts extend beyond simply mouthing or raising a cup to the lips, but do not fully meet the operation definitions outlined in Table X. A score of 1 could be awarded for an action where the key coding elements are not fully visible, or the child is not fully focused (loses focus) on the action but meets other operational definitions. If the view is very restricted code as 0.
2	The coder observes the child to perform an act of pretend play (e.g., the action fully meets the coding definitions described in Table X)

Table 3.

Example of completed Wave 4 pretend play coding template.

TIME	OBSERVATION	Type Of Pretend Play (SP,O,OP,OS,V)	Pretend Play Rating Code (0,1,2)
00:05:21	Raises toy cup to mouth and <i>Pretend to drink.</i>	SP	2
00:06:50	<i>Pretend to pour</i> from the toy frying pan into the toy sink.	O	2
00:06:52	<i>Pretend to spoon</i> from the toy sink into the toy frying pan using the toy spatula.	O	2

Important notes for coding:

- ✓ **KEY: Child should be focused on the action (defined by the child's gaze being towards the object).**
- ✓ **Pretend play can be distinguished from exploratory actions through observation of sound effects, the child's affect (smiling), exaggerated and elaborated gestures (e.g., exaggerated tilt of the head) and verbalisations.**
- ✓ Exaggerated tone of voice with speech can help to identify pretend play actions. Speech can be included as a type of exaggeration.
- ✓ 'SP' is used in the observation box to record *speech*; however, within the coding box the abbreviation SP represents *self-pretend*.
- ✓ Do not code if an item previously contained liquid. However, if the item contains pretend liquid that does not come out of the item, e.g. pretend milk in a toy bottle this can be counted as pretend play if the observed actions meets the coding definitions.

Additional KEY information:

- There will likely be additional pretend play actions which are not exemplified/defined/included in Table 4. The definitions in Table 4 can be used as a guide for coding additional pretend play actions. The coder should provide a detailed description of the action with the pretend element clearly described. The definitions for actions in Table 4 include coding rules such as exaggerated and elaborated gestures (e.g., deliberate tilts); sound effects; pretend speech; smiling and laughing; and the child creating 'imaginary' substances. If an action is observed to fit the above coding rules, or is an adaptation/akin to an action included in Table 4, then this should be coded as pretend play. The coder should award the appropriate pretend play code: SP, O, OP, OS, V.
- If an action is not defined/ exemplified in Table 4 exclude coding the action as pretend play if the child is just using an object in the way that it was intended (e.g., pressing buttons on the toy oven, pushing a toy vacuum cleaner back and forward, placing the frying pan inside the oven, placing the frying pan on the hob) without additional verbalisations (e.g., "I'm cleaning it!", using a playful, exaggerated tone of voice), sound effects (e.g., the sound of the vacuum cleaner; sound of a car) or exaggerated gestures (a clear knowing, smiling, playful look can be an exaggerated gesture).

Table 4.

The Pretend Play Observational Coding Scheme - Toddler module (PPoCS-T) pretend play enactments and operational definitions

Pretend play enactments	Coding definitions: Only needs to meet one definition (•)	Exclusion criteria
<p><i>Pretend to drink</i></p> <p>The child performs the action of drinking in the absence of real liquid.</p>	<ul style="list-style-type: none"> ▪ Moves item (e.g., cup; teapot; play bottle) towards mouth. Head tilts back or rotates/tilts the object towards mouth. If the tilt/rotation of the object is slight but the action is accompanied by a smile, drinking sound effect (e.g., “Slurp”), verbalisation (e.g. “Mmmmm”) or a ‘knowing, playful, smiling, look,’ towards an adult in the room, this can be coded as 2. ▪ Moves frying pan containing egg towards mouth, deliberate tilt of pan/head with pan at mouth as if to drink from frying pan. Obvious tilt must be apparent, or action must be supported by appropriate sound effect or verbalisation. (This could be classed instead as <i>pretend to eat</i> the egg, coders judgment, both SP actions) 	<ul style="list-style-type: none"> ○ Biting or chewing on the cup or teapot. ○ If adult is holding the cup, but there is a definite head tilt, code as 1 (<i>possible pretend play</i>). ○ Child moves the bottom of the cup or handle of the cup to mouth and then performs the action. Only code as (2) if the top of the cup (i.e., where liquid would be), top of the teapot or teapot spout is at child’s mouth. ○ Enacts the action with a cup which previously contained liquid. ○ Moves frying pan/bowl to face, covers face completely with item and tilts head. Must be at mouth/ opening of mouth.
<p><i>Pretend to eat</i></p> <p>The child performs the action of pretending to eat an item of play or non-existent food.</p> <p><i>Pretend to spoon food into mouth</i></p> <p>The child performs the action of spooning non-existent food to mouth.</p> <p>(The scooping of the non-existent substance is the pretend element)</p>	<ul style="list-style-type: none"> ▪ Moves an item of play food e.g., egg in the frying pan, plastic orange, towards mouth. The child performs a deliberate quick biting action/exaggerated biting actions (or chewing actions - can be evident from jaw movements) towards the play food. <ul style="list-style-type: none"> - The play food may briefly touch the child’s mouth, but it does not stay in the mouth. ▪ Verbalisations and clear eating sound effects can be used to code, e.g., “Mmm”, “Delicious” ▪ Moves spatula, spoon, utensil to mouth, as if picked up/holding ‘imaginary’ food followed by: exaggerated tilt towards mouth; exaggerated tilt of head; obvious eating mouth movements; sound effects or verbalisations; clear smiles 	<ul style="list-style-type: none"> ○ Chewing, sucking, or licking the play food (unless verbalisations clearly indicate pretending). ○ Performing the action with actual food. ○ Raising play food or pan containing egg to mouth with no additional eating motions, sound effects or vocalisations. ○ Places spoon/spatula into mouth without scooping/lifting from container/tilting/mouth movements/sound effects. Can code if follows these.

	<ul style="list-style-type: none"> ▪ Moves spatula/utensil into frying pan, sink or other such container, scoops/lifts 'imaginary substance' to mouth (may follow stirring). The scoop/lift of the 'imaginary' substance is the pretend element therefore eating motions not needed. Record as one pretend action – unless also includes a stirring action ▪ Moves hand towards mouth as if holding 'imaginary' food – must be very clear evidence of the 'imaginary' food, opens mouth and enacts eating mouth movements, sound effects/verbalisations. 	
<p><i>Pretend to talk on the telephone</i></p> <p>The child performs the action of pretending to talk on a toy telephone.</p>	<ul style="list-style-type: none"> ▪ Lifts telephone to ear, vocalises e.g., "Hello", "Goodbye" 	<ul style="list-style-type: none"> ○ Holds telephone to ear with no verbalisation.
<p><i>Pretend to sleep</i></p> <p>The child performs the action of pretending to sleep.</p>	<ul style="list-style-type: none"> ▪ Lays down and enacts pretend sleeping sound effects, e.g., snoring sounds 	<ul style="list-style-type: none"> ○ Do not code if eyes are not closed or if cannot see eyes (unless there is a clear sound effect).
<p><i>Pretend to pour</i></p> <p>The child performs the action of pouring in the absence of real liquid/item.</p>	<ul style="list-style-type: none"> ▪ The child rotates the object (e.g., cup/ teapot/ frying pan/ saltshaker) towards another object (e.g., cup) or over 'imaginary' non-existent object e.g., 'imaginary' food. If non-existent object, there needs to be clear evidence of the 'imaginary' substance (e.g., via verbalisation). <ul style="list-style-type: none"> - Must be focused on the action. - Must be a deliberate extension of arm; clear rotation of teapot (e.g., 180 degrees); deliberate hold (includes shaking) of the item (e.g., teapot; cup; salt shaker; bowl) above the object; or vocalisation (e.g., "Mmmm tea", "Shhhhhh", "all gone") 	<ul style="list-style-type: none"> ○ Just turning the item (e.g., teapot, cup, frying pan) upside down. To be coded as pretend play the object must be 'poured' towards something.

<p><i>Pretend to spoon a substance from one container to another.</i></p> <p>The child spoons or scoops from one container to another in the absence of real food or liquid.</p>	<ul style="list-style-type: none"> ▪ Places item (e.g., spoon, spatula) into a container (e.g., bowl, teapot; frying pan), moves the item (e.g., spoon, spatula) towards second container, rotates the item towards/inside the second container. - Obvious rotations, repetition of the movement with slight rotation— moving item back and forth repeatedly from same/different container (if no break in time record as one action) and verbalisations can help to code. 	<ul style="list-style-type: none"> ○ Moving item from one container to another with no rotation or verbalisation.
<p><i>Pretend to season</i></p> <p>The child pretends to add salt (or other substance) to play food (e.g., pretend egg, pretend frying pan) using the salt/pepper shaker.</p>	<ul style="list-style-type: none"> ▪ Holds, or rotates and holds, the saltshaker with top of the shaker facing downward. Shakes the saltshaker up and down above an object, e.g., frying pan, hand, or over 'imaginary' object e.g. 'imaginary' food. If 'imaginary', there needs to be clear evidence of the 'imaginary' substance (e.g., via verbalisation). ▪ Verbalisations, e.g., "Put more of this" can help to code. 	<ul style="list-style-type: none"> ○ Saltshaker held with top facing upwards (the rotation helps to distinguish between the child just liking the sound of the shaker/ using the shaker to make a noise). ○ Do not code if child rotates the saltshaker and shakes up and down if no recipient of the salt. Recipient should be in view.
<p><i>Pretend to chop/slice/cut</i></p> <p>The child performs the action of pretending to chop/slice a piece of play food with play knife.</p>	<ul style="list-style-type: none"> ▪ Moves the plastic knife towards a piece of play food, moves the knife up and down/back and forth on the play food. ▪ Moves the knife to be above a piece of play food, holds the knife in a deliberate and focused manner above the item of food. Knife is held for an exaggerated time period above the item of food. ▪ Can code if the coder has evidence of 'imaginary' food, for example the child approaches a plastic plate and enacts a cutting or chopping motion, or speech provides additional evidence of pretending. 	<ul style="list-style-type: none"> ○ Simply banging the item of play food with the knife. ○ Holding the knife above an item which is not play food, e.g. jigsaw piece. ○ Using the play knife to actually slice (e.g., through the toy cake pieces joined with Velcro).
<p><i>Pretend to stir</i></p>	<ul style="list-style-type: none"> ▪ Obvious rotation (round and round or back and forth movements) of spoon, spatula (or other kitchen utensil) as 	<ul style="list-style-type: none"> ○ The child repeatedly hits/bangs the edges of the container with the stirring

<p>The child performs the action of stirring in the absence of real food or liquid</p> <ul style="list-style-type: none"> - Exercise caution with the frying pan containing the egg, be cautious that the child is not simply banging the egg to make a sound or trying to get the egg out of the frying pan. 	<p>if stirring some 'imaginary' liquid within, or above an object (e.g., cup; bowl).</p> <ul style="list-style-type: none"> - Verbalisations can help with coding, e.g., "Stirring soup", (Barton, 2007, p. 126) 	<p>implement, without any rotation (we do not have evidence that the child is pretending, may be enjoying the noise.</p>
<p><i>Pretend offer (of non-existent, 'imaginary' substance)</i></p> <p>Offers non-existent (e.g., tea) or transformed object towards peer; parent; or inanimate object (e.g., doll; teddy; jack-in-a-box). Towards "mouth", or placing next to them, e.g., a 'cup of tea' next to them.</p>	<ul style="list-style-type: none"> ▪ Needs to be accompanied by verbalisation or clear additional pretend play action. <ul style="list-style-type: none"> ✓ Child offers/gives cup to peer, SP, "Cup of tea" (i.e., 'imaginary' substance); ✓ Child pours into cup, meeting the coding definitions for pretend to pour, and offers to peer (i.e., 'imaginary' substance). This would be recorded as two actions, pretend to pour and pretend to offer. ✓ Child moves kitchen/tea set item (e.g., frying pan; cup)/drink towards others mouth, or inanimate object's mouth and hand tilts or rotates towards other's mouth (tilt indicates the 'imaginary' substance). ✓ Child spoons out 'imaginary' substance (meeting definition for pretend to spoon and moves spoon towards others mouth (record as one action)) 	<ul style="list-style-type: none"> ○ Pressing play food (or actual food) to another's mouth.

<p><i>Pretending towards other (specifically inanimate object)</i></p> <p>The child offers the plastic play food or kitchen item towards inanimate objects face (puppet; toy with face; teddy; doll).</p>	<ul style="list-style-type: none"> ▪ Moves kitchen/tea set item (e.g., frying pan; cup) food/drink towards or at inanimate objects mouth. ▪ Must be focused, looking at the puppet, doll etc. ▪ Exaggeration of holding the item at the ‘mouth’, tilt, verbalisation or sound effect needed to code as pretend to offer. 	
<p><i>Object substitution</i></p> <p>“The use of one object as if it were a different object” (Ungerer & Sigman,1981, p. 324; Lillard, 1993, p. 352)</p> <p>One object stands in for another object (Olson & Campbell, 1988)</p> <p>Can include transforming body part into an object.</p> <p>Code as OS and other types of pretend, e.g., would be OS and O if used a jack-in-a-box to pretend to pour.</p>	<ul style="list-style-type: none"> ▪ Transforms one object into a different object. ▪ Transforms body part into an object. ▪ Can only be coded if the child transforms the object, performs an action and the action fits the coding definitions for pretend play, e.g., uses jack-in-a box toy to pretend to pour must meet coding definition for pretend to pour e.g., tilting the object above another object; Using hand as a telephone, must vocalise (e.g., “Hello”) with hand at ear, i.e., meeting definition for pretend to talk on the telephone OR ▪ Child verbally transforms an object, e.g., holding a wooden block, SP, “Toast!”; places bowl on head, SP, “Hat!”. - Use of wooden brick can only be coded as a transformation to food if child is focused on the action and additional pretend action is clear e.g., <ul style="list-style-type: none"> ✓ Brick is placed in frying pan and frying pan is treated as if contains food, e.g., raised to mouth and satisfies coding definitions for pretend to eat, pretend to drink. ✓ Brick is placed in frying pan, spatula is rotated to move brick around. 	<ul style="list-style-type: none"> ○ Wooden brick held in front of mouth or wooden brick in mouth. ○ Wooden brick in frying pan. ○ Wooden brick in oven. ○ Pepper pot/saltshaker in the oven. ○ Banging/stirring with hand (includes in frying pan or bowl). ○ Lifts plastic container/jar (such as one that holds toys) to pretend to drink. This could be a drinking vessel (can be coded as pretend to drink) ○ Arranging blocks in pan.

<p><i>Verbal pretend play enactment (V)</i></p> <ul style="list-style-type: none"> ▪ <i>Verbally attributes absent properties to object or situation</i> <p>The child refers to properties of an object or situation that are not literally present</p> <ul style="list-style-type: none"> ▪ <i>Verbal statement of pretend activity</i> <p>The child announces a statement of pretend activity</p> <ul style="list-style-type: none"> ▪ <i>Child acts on an object with accompanying pretend verbalisations/sounds/noises</i> 	<p>Examples below (not exhaustive):</p> <ul style="list-style-type: none"> ▪ Could be speech relating to cooking or could be attributing animacy/real life properties to an object (e.g. doll/teddy) ▪ E.g. “It’s ready”, with playful, exaggerated tone of voice, looking at the oven. ▪ “I’m making it”, in exaggerated tone, looking at the frying pan. ▪ “Here it comes!” with playful, exaggerated tone of voice, looking at the oven. ▪ Hugs self, and SP, “Brrrrrr” ▪ Talks to a doll as if it is animate, picking up the doll, “Baby”, “Come now!”, “Your bed”. ▪ Blows on frying pan, “It’s hot”, (or if made “Shhhhhh” sound would be acting on object with pretend noises) <ul style="list-style-type: none"> ▪ Makes a statement about a pretend activity, “I cooks!” holding the frying pan. <ul style="list-style-type: none"> ▪ Pushes a car/toy train along the floor and vocalises engine sound effects, SP, “Vroom, vroom”, “Choo, choo” 	<ul style="list-style-type: none"> ○ Answering yes to question about attributes, e.g., “Is the stove hot”, “Is it cooking” and child replies, “Yes”. ○ Pointing at an item, e.g., washing machine or clock and vocalising the noise: “round and round!”, “tick, tock”); ○ “Pop, pop, pop!” pointing at the toy toast. ○ “Toast, toast, toast!” pointing at the toy toast. ○ Toast go down” pointing at the toy toast. ○ Presses toy down and vocalises, “Pop”. <ul style="list-style-type: none"> ○ If the child is just pointing to an object and vocalising sound effects, e.g., points to a dog and SP, “Woof, woof”. Child needs to be acting on an object.
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Appendix D

The Pretend Play Observational Coding Scheme - Infancy Module (PPoCS-I): Manual Provided to Coders

Coding Scheme for 20-minute free play session in the laboratory at Wave 3

Record five types of enactments with the picnic/ tea-set items (**carried out in the absence of real food or real liquid**):

Pretend to Drink; Pretend to pour; Pretend to eat; Pretend to feed other (peer or adult); Pretend to feed other (inanimate object)

Broad definitions are provided in **bold text** for each action, e.g., **Infant pretend to drinks from cup, teapot, or bowl**. The coder should refer to the broad definitions initially, then refer to the notes for each action, e.g., “The infant must be **focused on the action**”; then to the enactment criteria, e.g., “Item at mouth → Infant’s **head tilts fully backwards**”; and then to the exclusion criteria, e.g., “Enactment with the bottom/handle of the object at mouth”.

The coder should award a rating to the action of 0, 1, or 2.

A score of 2 is given where the action meets the coding definitions/ enactment criteria described in the coding scheme below and does not meet any of the exclusion criteria.

A score of 1 is awarded for an act of possible pretend play. Actions extend beyond simply mouthing or raising a cup to the lips, but do not fully meet the requirements of the enactment criteria (2). **Examples of possible pretend play actions (1) are defined below; however, this is not intended to be an exhaustive list.**

Infants are awarded an overall score ranging between 0 and 2, based on their highest level of action displayed.

The coder should record the time the action starts. The coder should transcribe a description of the observed pretend play action, including the pretend action code italicised below e.g., ***Pretend to Drink*** and include at least one of the enactment criteria that is met (there may be just one, or there may be multiple:

Examples of transcribing:

00:16:31: **Pretend to Drink (2)**. (*Head tilts fully backwards, held backwards for duration of two seconds)

00:20:56: Tilts teacup above jam tart. **Pretend to Pour (2)**. (*Rotation + hold of teapot = two second duration)

Each action is transcribed separately (each time noted), even if the actions appear in sequence.

Table 1.

The Pretend Play Observational Coding Scheme - Infancy module (PPoCS-I) pretend play enactments and operational definitions

<i>Pretend to Drink</i>	Infant drinks from cup, teapot, or bowl (in the absence of real liquid)	Pretend action toward self (SP)
<ul style="list-style-type: none"> • The top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be at the infant’s mouth during at least <u>part</u> of the ‘drinking’ action. • The infant must be <u>focused on the action</u>. Looking towards the object; inside the object; eyes looking up/down etc., <u>not just looking around the room</u>. <p style="margin-left: 40px;">*If the infant loses focus during <u>part</u> of the action but the action appears <u>very deliberate/exaggerated</u>, e.g., the head tilt is fully backwards, or the rotation of cup is fully at a right angle and held at mouth (<u>and there was a definite focus during part of the action duration</u>) the action can be coded.</p>		
<p>Pretend enactment criteria (2)</p>		
<ul style="list-style-type: none"> ✓ Item at mouth → Infant’s <u>head tilts/rotates backwards</u> → continuous duration of tilt/rotation is <u>two</u> or more seconds. <p>*Duration: Until head is back to a neutral position, i.e., including the duration of the forward movement of the head.</p> <ul style="list-style-type: none"> ✓ Item at mouth → Infant’s <u>head tilts fully backwards</u>. ✓ Item at mouth → Infant’s <u>head tilts backwards from a neutral position</u> → head is <u>held backwards</u> (with item still at mouth) for <u>two</u> or more seconds. <p>*Duration: Until head is back to neutral position.</p>		

- ✓ Can be coded if the head is rotated for one second and additionally held back for one second. The combined movement of the action is a two second duration.
- ✓ Infant tilts/rotates item at mouth or towards mouth/face (item may be already touching mouth) (not just lifts item to mouth/not lifting duration) → continuous duration of tilt/rotation is two or more seconds.

NB. With the use of a bowl the coder should be conservative if child just rotates the bowl from a horizontal position to just exploratory covering their face (this is more like an exploratory game than enacting pretending to drink).

*Duration: A complete, continuous movement of the item, until the item is stationary at the face (possibly prior to the item being held at mouth) OR

*Duration: Until the complete rotation of the item is finished and the item is stationary away from the mouth (i.e., if there is a continuous rotation of the item towards and away from the mouth) - do not measure a hold duration, must be continuous rotation movement.

- ✓ This may be in combination with a head tilt, i.e., continuous rotation of the item towards the mouth and the item continues to rotate at the mouth as the head tilts.
- ✓ Infant tilts/rotates item towards mouth/face at an angle of approximately 90 degrees (this is the approximate angle of a teacup being rotated from a neutral position to be fully flat/vertically in line with the face).
- ✓ This may be in combination with a head tilt, i.e., continuous rotation of the item towards the mouth and the cup continues to rotate at the mouth as the head tilts.

NB. With the use of a bowl the coder should be conservative if child just rotates the bowl from a horizontal position to just exploratory covering their face (this is more like an exploratory game than enacting pretending to drink).

- ✓ Brief or slight tilt duration (head or item); hold duration (head); angle of item tilt (e.g., under two seconds; less than 90 degrees) but accompanied by:

→ A drinking sound effect/exaggerated exclamation (e.g., “slurp”) in sync with the action. If the sound effect is very clear this can be coded as *Pretend to drink* if the infant only holds the item at their mouth with no additional rotation/tilting exaggeration.

→ Clear “lip smacking”/ lip movements (this may be evident from the infant’s jaw moving). If the item is held at the mouth with no rotation/tilting exaggeration, or if the item has been removed from the mouth but the lip movements are obvious, and the infant is focused on the action, this can be coded as *Pretend to drink*.

→ Clear/obvious smiling; laughing; satisfied look (e.g., towards parents as licking lips). This needs to be accompanied by at least a brief tilt/rotation of the item.

→ *Pretend to drink* can be coded if the child engages in repetitions of actions, i.e., repeatedly enacting one second durations of the cup towards the mouth. The repetition is the exaggeration. (Do not code if the repetitive actions fit an exclusion criteria)

Possible examples (1)

- ✓ Adult, or peer, holds the item at/towards infant’s mouth. Infant demonstrates enactment criteria (2), e.g.,
 - Tilts head back
 - Enacts lip smacking movements
 - Lowers mouth to cup, holds mouth at cup, smiles
- ✓ Coder is unsure if the infant is tilting head back deliberately or moving head to look at something/ someone in the room. Eyes should be looking up if deliberate head tilt. Would only be coded (1) if the head tilt met (2) criteria first.
- ✓ Camera angle of the action is partially restricted, e.g., the coder is not sure that the item is still at the child’s mouth. If the exaggerated part of the action is visible but the rest of the view is restricted *Pretend to drink* can still be coded, e.g., if camera angle obscured at first but coder can observe clear lip smacking; head may not be fully visible but infant’s neck crease shows head fully tilted back (although coder should be cautious if eye gaze is not visible), or two second rotation duration. The mirror in the party room can be used to aid observation.

- ✓ Infant is focused on the item and lifts item to/near mouth, but this is followed by brief/slight tilt/rotation/hold, e.g., one second duration of tilt of item towards mouth/one second head tilt backwards/ less than 90-degrees cup angle rotation towards mouth.
- ✓ Infant is not focused on the item but there is a deliberate two second cup back and forth rotation duration.
- ✓ Possible drinking sound effects/smiling/lip smacking etc. The coder is unsure.
- ✓ Duration criteria not fully met because item falls away from mouth during the tilting action.

Exclusion criteria

- Enactment with a cup that previously contained liquid (e.g., white paper cup).
- Enactment with a plastic plate (unless accompanied by clear drinking sound effects).
- Enactment with the bottom/handle of the object at mouth.
- Chewing on the item (evidence for lack of focus/awareness/afforded by the object).
- A head tilt/rotation that is barely noticeable but held backwards – the coder should exercise some judgement.
- The action needs to be completed using hands. Do not code if the infant is biting on cup and tilts head back with hands not touching the item.

<i>Pretend to Eat</i>	Actions with the plastic food that exclude mouthing or chewing the food	Pretend action toward self (SP)
<ul style="list-style-type: none"> The infant must be focused on the object during some part of the action, e.g., looking towards the object <u>not looking around the room.</u> 		
<p>Enactment criteria (2)</p>		
<ul style="list-style-type: none"> ✓ Infant moves an item of plastic food towards their mouth. Performs a <u>deliberate, exaggerated biting action towards the food.</u> The action is quick. <ul style="list-style-type: none"> • Mouth is open wide. • <u>Not an actual bite of the item.</u> ✓ Infant moves an item of plastic food towards their mouth. Performs <u>deliberate biting actions towards the food.</u> Can be coded from the observation of the child's jaw moving. <ul style="list-style-type: none"> • The plastic food may briefly touch the child's mouth <u>but it does not stay in the mouth.</u> ✓ Infant <u>holds plastic food in front of mouth</u> and enacts obvious "<u>lip smacking</u>" movements. ✓ With plastic food at/near mouth, infant <u>enacts eating sound effects</u>, e.g., "Yum, yum"; "Yam, yam". ✓ <i>Pretend to eat</i> can be coded if the infant enacts the action with a <u>bowl/plate</u>, however, only if accompanied by <u>clear eating sound effects.</u> ✓ <i>Pretend to eat</i> can be coded if the infant demonstrates obvious "Lip smacking"/lip movements after an item of plastic food was at/near the mouth. The item must have been near to the mouth at one point to code as <i>Pretend to eat.</i> 		

Possible examples (1)

- ✓ Infant enacts obvious/deliberate “lip smacking” movements but has no plastic food at mouth.
- ✓ Infant performs a small deliberate bite towards the plastic food but the coder is unsure if the infant’s mouth is fully open.
- ✓ The camera angle of the action is restricted.
 - *If the camera angle is very restricted code as (0), e.g., if the infant’s mouth is not visible.
- ✓ Eating sounds effects are not clear/coder is unsure if the noises are eating noises.
- ✓ Infant enacts obvious lip movements but is not fully focused on the action.

Exclusion criteria

- Chewing, sucking or licking the plastic food (i.e., mouthing the food).
- Biting the plastic food, e.g., plastic orange in mouth and lips moving.
- Using a non-plastic food item, e.g., a jigsaw piece.
- Using a plate, e.g., infant raises the plate flat to their face and enacts lip movements.
- Performing the action with real food.
- Moving the plastic food around in front of their mouth with no other exaggerations.
- Enacting sound effects, but not eating style sound effects.

<i>Pretend to Pour</i>	Infant pours from item (e.g., teacup, teapot) in the direction/ above a recipient (e.g., plate; teacup; another child) (in the absence of real liquid)	Pretend action towards object (O)
<ul style="list-style-type: none"> • The top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be moved in the direction of/ angled towards the receiving object. If the child uses a substitute object, or there is evidence that a different part of an object is being used “as if” it were a spout/opening this can be coded as <i>Pretend to pour</i>. • To be coded as <i>Pretend to pour</i> the infant must be focused on the action, e.g., looking towards the object, inside the object etc., <u>not looking around the room</u>. <p>*If the infant loses focus during <u>part</u> of the action but the action appears <u>very deliberate/ exaggerated</u> (and there was a definite focus during <u>part of the action duration</u>) the action can be coded as <i>Pretend to pour</i>.</p>		
Enactment criteria (2)		
<ul style="list-style-type: none"> ✓ The item is <u>rotated/angled towards/above</u> the recipient and the “<u>pour</u>” (item opening facing down/towards/in the direction of the recipient) is held for <u>two</u> seconds or more. <ul style="list-style-type: none"> • Can be coded as <i>Pretend to pour</i> if the action is a gross motor movement, i.e., the infant extends their arm fully and this is followed by a “pour”/hold. • Can be coded as <i>Pretend to pour</i> if the action is more of a precise angling/turning of the item in the hand (towards the receiving object) and this is followed by a “pour”/hold. • Can be coded as <i>Pretend to pour</i> if the “pour”/hold duration involves <u>shaking the item up and down/back and forth</u>, if it is towards/in the direction of the recipient. 		

- ✓ The item is rotated/angled towards/above the recipient and the rotation duration is for two seconds or more.
 - Can be coded as *Pretend to pour* if the action is a gross motor movement, i.e., the “pouring” duration involves the infant extending their arm fully.
 - Can be coded as *Pretend to pour* if the “pouring” action is more of a precise angling/turning of the item in the hand (towards the receiving object).
 - Can be coded as *Pretend to pour* if the “pouring” duration involves shaking the item up and down/back and forth, if it is towards/in the direction of the recipient.

*Duration: Movement and return of item to stationary/upright position – if there was a whole arm action then record the duration until the arm is back by side of infant’s body and the cup is stationary (if all part of a continuous movement).
- ✓ The rotation duration can be combined with a hold duration and coded as *Pretend to pour* if the child is focused on the action at one point (as described in the box above) and the combined duration of the rotation and hold is two seconds or more.
- ✓ The item is rotated towards/above the object/child and the angle of rotation is approximately 180 degrees.

Possible examples (1)

- ✓ Infant is focused on the action, brief rotation of teapot (one second duration) towards the plate.
- ✓ Restricted camera angle, definite rotation of the teapot with extended arm hold but the coder cannot observe if the object is angled towards another object.

*Can be coded as *Pretend to pour* if the recipient item is in view, but the coder is unsure what the item is.

- ✓ Clear rotation of the item but the side of the item (e.g., cup/teapot) is angled towards the recipient object.
- ✓ Infant is not focused on the action but there is a 180 degrees angle of rotation of the item.

Exclusion criteria

- No recipient of the “pour”.
- Infant completely covers the teacup with the teapot.

Pretend to Feed other (peer or adult)

The infant offers the plastic cup; teapot; bowl; plate; plastic food towards peer or adult’s mouth, as if feeding the other (in the absence of real food or drink)

Pretend action towards other (OP)

- The top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be moved in the direction of/ angled towards the recipient (peer or adult).
- The infant must be focused on the action, e.g., looking towards/in the direction of the recipient (peer or adult) for part of the action, not looking around the room.

Pretend enactment criteria (2)

- ✓ Infant moves the cup, teapot or bowl towards adult or peer's mouth. The action is accompanied by a rotation of the item/ hand tilt towards the other's mouth (can still be coded if the item touches the others mouth).
- ✓ *Pretend to feed other* can be coded if there is no obvious rotation of the item but the item is angled the correct way (e.g., the opening of cup is angled, by the infant, downwards towards the recipient's mouth) and additionally held at the recipients mouth for a duration of two seconds or more.
- ✓ Infant moves the plastic food or plate towards peer or adult's mouth and enacts eating sound effects, e.g., "Yam, yam, yam"; obvious smiling (in addition to a two second hold duration); speech. Do not code as *Pretend to feed other* if the infant moves the plastic food to other's mouth with no additional exaggeration criteria displayed.

Possible examples (1)

- ✓ Infant holds the item, angled the correct way (e.g., the opening of cup is angled, by the infant, downwards towards the recipient's mouth), for one second duration at adult or peer's mouth with no other exaggeration (e.g., no tilt or rotation of the item towards other's mouth).
- ✓ Camera angle is restricted. Example: The infant turns the item in hands in a deliberate, focused manner to be correct way and moves towards/in direction of others mouth, restricted camera angle prevents coding from ascertaining if to other's mouth.
- ✓ Coder is unsure that the infant is fully focused on the action.

Exclusion criteria

- Using a non tea-set item such as a jigsaw piece.
- Infant angles the item towards adult or peer’s body and not towards mouth.
- Performing a holding action using the bottom of the teapot/cup.

<i>Pretend to Feed other (inanimate object)</i>	The infant offers the plastic cup; teapot; bowl; plate; plastic food towards inanimate object’s “mouth”, as if to feed the toy (in the absence of real food or drink)	Pretend action towards other (OP)
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- The top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be moved in the direction of/ angled towards the recipient (inanimate object).
- The infant must be focused on the action, e.g., looking towards/in the direction of the recipient (toy) for part of the action, not looking around the room.

Enactment criteria (2)

- ✓ Infant moves the cup, teapot, or bowl towards the inanimate objects mouth. The action is accompanied by a deliberate rotation of the item/hand tilt/turn or two second hold towards/at inanimate objects “mouth”.
- ✓ Infant moves the plastic food or plate towards the inanimate objects “mouth” and the item is held (can be moving it around in front of “mouth”) at the “mouth” for a duration of two seconds or more.

✓ Infant moves the cup; teapot; bowl; plate; plastic food towards the inanimate objects “mouth” and enacts clear eating or drinking sound effects, e.g., “Yam, yam, yam”.

Possible examples (1)

- ✓ Infant holds the item at the inanimate objects “mouth” briefly (e.g., a one second hold duration).
- ✓ Camera angle is restricted. Example: The infant turns the item in hands in a deliberate, focused manner to be the correct way and moves towards/in direction of inanimate object. Restricted camera angles prevent the coder from ascertaining if this is towards the toy’s “mouth” (if the coder has evidence that it is in line with the mouth then *Pretend to feed otherfor* inanimate object can be coded).
- ✓ Coder is unsure that the infant is fully focused on the action.

Exclusion criteria

- Using a non tea-set item such as a jigsaw piece.
- Infant angles the item towards inanimate objects “body” and not towards mouth.

Appendix E

The Pretend Play Observational Coding Scheme – Early Childhood Module (PPoCS-C): Manual Provided to Coders

<p><i>Verbal pretend play enactment (V)</i></p> <p>Additional coding notes</p>	<ul style="list-style-type: none"> ➤ Pretend verbalisations and sound effects can accompany the actions described in Table 1 (below) and can help the coder to define an action as a pretend play enactment (examples included with operational definitions below). If the speech (or sound effect) supports, confirms, or accompanies a pretend play action from Table 1 then the coder should record the speech with the observed pretend play action and this will be counted as one pretend enactment e.g., <i>Pretends to drink</i> and SP (Speak), “Yum!”; rotates plastic container towards cup and SP, “Some more, some more” or <i>Pretend offer</i> tea to peer, SP, “Here’s tea”. Record V code in addition to the action code. For example, SP (pretend action towards self) + V; O (pretend action towards object) + V; OP (pretend action towards other) + V; OS (object substitution) + V. The speech (and code V) indicates that the child has verbally attributed properties to an object, or situation, that are not literally present, e.g., liquid; taste; animacy of object, or transformation of object to object not present. Literal speech accompanying pretend actions is not coded as V. ➤ Sometimes there might be numerous speech segments following an action. For example, the child may lift the cake to their mouth and perform a deliberate biting action accompanied by an eating sound effect; the sound effect supports the coding of the action as a pretend enactment (SP+V). One second later the child may then vocalise, “Very nice!” (V) and then two seconds later vocalise, “I’ve eaten it” (V). Following McLoyd (1980) where an “utterance was defined as any word or string of words communicating one thought or idea or any non-lexical item associated with a sound property of an imaginary or real object” (p. 1135) if the speech portrays distinct meanings it should be transcribed with different time codes (and counted as separate enactments). In the example above, the first meaning is ‘eating’, the next meaning is the ‘taste’ of the food and the last meaning is the child reporting on the pretend act. In contrast, if the child SP, “Some more, some more” (while tilting the plastic container above a cup to pretend to pour), then further SP, “Some more, some more, some more” here the speech is all part of one idea, similarly, “Slurp, slurp, slurp” with one drinking action, or moving the plane continuously with numerous “Neeeeoooooww” sounds is seen as one idea and these examples are considered as akin to repetitions of pretend drinking with cup at mouth and are seen (and counted) as one continuous enactment. If there is a break in a string of words or vocalisation, or a break in an action with supporting vocalisation, e.g., the child is moving a toy car with accompanying “Brum, brum, brum” verbalisations, but stops moving the car, turns the car around and repeats the movement with additional “Brum, brum, brum” verbalisations then this would be counted as two verbal pretend enactments. Or child SP, “I’m Fireman Sam” and runs across party room, stops, further shouts, “I’m Fireman Sam” and runs the opposite way across the party room, this would be two enactments; viewed as akin to two separate pretend to drink enactments.
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	<ul style="list-style-type: none"> ➤ Sometimes the child may use speech while acting in a way that cannot explicitly be defined as pretend play, e.g., placing food in the oven and looking at the oven could be defined as pretending to cook, but it is hard to operationally define this. The child's speech can define an action as pretend play when the action alone would not be counted. The child may verbally attribute a property to such a situation, or alternatively to an object, using a playful or exaggerated tone and this indicates the non-literal; transformational; as if element of the action, e.g., "It's ready!"; "It's coming!", "It's hot". Alternatively, the child may vocalise a verbal statement of pretend activity, e.g., "I'm making tea!" while holding the teapot; with hand on toy truck, SP, "The truck is on fire!" but with no other obvious pretend action. Such speech should be recorded as a <i>verbal pretend play enactment</i> and the coder should note a description of what the child is doing to accompany the pretend speech. Code as (V) and assign a 0, 1, 2 code. ➤ Further operational definitions in Table 1 ➤ Exaggerated/playful tone of voice (Howe et al., 1998) indicates play enactment and helps with coding as pretend.
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Definitions of categories

"The basic unit of behaviour used in the analysis was the turn. A turn was defined as a coherent unit of behaviour which could consist of either an act, a gesture or a vocalization occurring alone;

an act accompanied by a vocalization; an act immediately followed by a related gesture and/or vocalization;

or a co-occurring gesture and vocalization." (Zinober & Martlew, 1985, p. 296)

Table 1. The Pretend Play Observational Coding Scheme – Early Childhood module (PPoCS-C) pretend play enactments and operational definitions

<p><i>Pretend to drink</i></p> <p>The child performs the action of drinking in the absence of real liquid</p> <p>Pretend action toward self (SP)</p>	<ul style="list-style-type: none"> ▪ Moves item (e.g., cup; teapot; play bottle) towards mouth. Head tilts back or/and rotates/tilts the item towards mouth/face. If the tilt/rotation of the object is very slight but the action is accompanied by a smile/laughing/satisfied look (e.g., towards parents as licking lips) this can be coded as <i>pretend to drink</i>. ▪ A drinking sound effect (e.g., “Slurp”) or appropriate pretend verbalisation (e.g., “Mmmm”); “This is tasty”) accompanying the item at the mouth can also be used to code <i>pretend to drink</i>. If there is sound effect or appropriate verbalisation, a tilt of the item is not required. Add Code V to the transcript line. ▪ Clear “lip smacking”/ lip movements (this may be evident from the child’s jaw moving). If the item is held at the mouth with no rotation/tilting exaggeration, or if the item has been removed from the mouth but the lip movements are obvious, and the child is focused on the action, this can be coded as <i>Pretend to drink</i>. ▪ To be coded as <i>Pretend to drink</i> the top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be at the child’s mouth during at least part of the “drinking” action. ▪ Child must be focused on the action (during at least part of the action, i.e., looking towards/eyes looking down inside the cup at one point - not looking aimlessly around the room - or sound effect/verbalisation indicates deliberate/focused action). ➤ If the child engages in brief repetitions of tilting cup to mouth, the repetition can indicate pretend play - if the item remains at the mouth code as one <i>pretend to drink</i> action. 	<ul style="list-style-type: none"> ○ Chewing on the cup or teapot indicates lack of focus (unless verbalisations or sound effects indicate pretend play). ○ If adult is holding the cup, but there is a definite head tilt, code as 1 (<i>possible pretend play</i>). ○ Child moves the bottom of the cup or handle of the cup to mouth and then performs the action. Only code as (2) if the top of the cup (i.e., where liquid would be), top of the teapot or teapot spout is at child’s mouth. ○ Enacts the action with a cup which previously contained (or still contains) liquid, e.g., the white plastic cups (if pretend milk in toy bottle that doesn’t come out- this can be coded). ○ The action needs to be completed using hands. Do not code if the child is biting on the item and tilts head back with their hands not touching the item.
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<p><i>Pretend to eat</i></p> <p>The child performs the action of pretending to eat an item of play or non-existent food.</p> <p><i>Pretend to spoon food into mouth</i></p> <p>The child performs the action of spooning non-existent food to mouth.</p> <p>(The scooping of the non-existent substance is the pretend element)</p> <p>Pretend action toward self (SP)</p>	<ul style="list-style-type: none"> • Moves an item of play food e.g., plastic orange; plastic cake towards mouth. The child performs a deliberate quick biting action/ deliberate biting or chewing actions (jaw movements can show these actions) towards the play food or holds play food in front of mouth and enacts obvious “lip smacking” movements. • <i>Pretend to eat</i> can be coded if the child demonstrates <u>obvious</u> “lip smacking”/lip movements after an item of play food was at/near the mouth. The item must have been near to the mouth at one point to code as <i>Pretend to eat</i>. ➤ If the play food remains near mouth and the child performs repeated biting actions towards the play food code as one <i>pretend to eat</i> action. The repetition helps to indicate pretend. • The play food may briefly touch the child’s mouth, but it does not stay in the mouth. Not an actual bite of the item (unless verbalisations; sound effects or additional exaggerated biting actions towards food clearly indicate pretend play). • Verbalisations and clear eating sound effects can help with coding an action as <i>pretend to eat</i>, e.g., “Mmmmm”; “Delicious”; “Finished!”; “Yummy, yummy, yummy!”; “Yam yam yam” “Very nice” with play food (or other item) at/near/immediately following food at mouth (<i>no biting actions needed</i>). Add Code V to the transcript line • Moves spatula; spoon; utensil to mouth followed by: exaggerated tilt/rotation towards mouth; exaggerated tilt of head; obvious eating mouth movements; sound effects or verbalisations; clear smiles. • Moves item (e.g., spatula; spoon; utensil etc.) into frying pan; sink; cup; bowl or other such container, scoops/lifts ‘imaginary’ non-existent substance to mouth (may follow stirring). The scoop/lift is the pretend element; therefore, eating motions not needed – item may go into mouth. Record as one pretend action – unless also includes a stirring action. • Moves hand towards mouth (as if holding ‘imaginary’ food), opens mouth and enacts eating mouth movements/ sound effects/verbalisations. Must be clear evidence of ‘imaginary’ non-existent food, e.g., via speech. • Performs a grasping action with fingers (often a pincer grip with thumb and forefinger, or tripod grip with thumb, forefinger and middle finger) towards the plastic food, e.g., bunch of plastic grapes (as if grabbing a grape/food) and raises hand to mouth. Places hand in mouth/ enacts eating mouth movements/ sound effects or verbalisations. The pretend element is indicated by the “pretend” grasp at the food; therefore, fingers should remain clearly in pincer or tripod grip following a grasp and movement towards mouth. 	<ul style="list-style-type: none"> ○ Chewing, sucking, or licking the play food - unless verbalisations (“Yummy!”) or sound effects (“Mmmmm”) or additional exaggerated biting actions <u>towards</u> food; lip smacking after <u>clearly</u> indicate pretending. ○ Biting the play food, e.g., plastic orange in mouth and lips moving - unless verbalisations, sound effects or additional exaggerated biting actions <u>towards</u> food; lip smacking after <u>clearly</u> indicate pretending. ○ Performing the action with actual food. ○ Raises play food to mouth with no additional eating motions, sound effects or vocalisations. ○ Places spoon/spatula into mouth without scooping action /lifting from container/ tilting/mouth movements/sounds effects. Can code if follows these. ○ Moving the play food around in front of mouth with no other exaggerations.
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<p><i>Pretend to talk on the telephone</i></p> <p>The child performs the action of pretending to talk on a toy telephone</p> <p>Pretend action toward self (SP)</p>	<ul style="list-style-type: none"> ▪ Lifts plastic/toy telephone (real telephone if it has not rung) to ear, vocalises e.g., “Hello”, “Goodbye”. 	<ul style="list-style-type: none"> ○ Holds telephone to ear with no verbalisation.
<p><i>Pretend to sleep</i></p> <p>The child performs the action of pretending to sleep.</p> <p>Pretend action towards self (SP)</p>	<ul style="list-style-type: none"> ▪ Lays down and enacts pretend sleeping sound effects, e.g., snoring sounds, or other verbalisations indicate pretend. 	<ul style="list-style-type: none"> ○ Do not code if eyes are not closed or if cannot see eyes - unless there is a clear sound effect/verbalisation.

<p><i>Pretend to pour/pretend to add</i></p> <p>The child performs the action of pouring/adding in the absence of real liquid/item.</p> <p><i>Pretend action towards object O</i></p>	<ul style="list-style-type: none"> ▪ The child rotates/angles the object (e.g., cup; teapot; milk jug; frying pan; saltshaker) towards another object (e.g., cup) or over ‘imaginary’ non-existent object (e.g. ‘imaginary’ food). If non-existent object, there needs to be clear evidence of the ‘imagined’ substance (e.g., via verbalisation). ▪ Must be a deliberate extension of arm/ rotation of item/ deliberate hold (includes shaking) of the item (e.g., teapot; cup; salt shaker; bowl) above the object/ or verbalisation/sound effect (e.g., “Mmmm tea”; “Shhhhhh”; “Tshhh”; “All gone”; “There’s water, water here”). Add Code V to the transcript line. ➤ If the teapot (or another pouring object) is angled towards a cup (or another receiving object) and child continuously moves the teapot towards additional cups without additional rotations OR additional sound effects, the repetition of the action can indicate pretend play – record as one <i>pretend to pour</i> enactment. ▪ Must be focused on the action (during at least part of the action). ▪ The top opening of the cup; top opening of the teapot, or teapot spout; top/edge of the bowl should be moved in the direction of/ angled towards the receiving object. If the child uses a substitute object, or there is evidence that a different part of an object is being used “as if” it was a spout/opening this can be coded as <i>Pretend to pour</i>. 	<ul style="list-style-type: none"> ○ Just turning the item (e.g., teapot; cup; frying pan; milk jug) upside down. To be coded as pretend play the object must be ‘poured’ towards something. Unless clear verbalisations indicate that the pour (or emptying of ‘imaginary’ liquid) is towards an ‘imaginary’, non-existent object. ○ Using an item that contained (still contains) real liquid, e.g., white plastic cups.
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<p><i>Pretend to spoon from one container to another.</i></p> <p>The child spoons or scoops from one container to another in the absence of real food or liquid</p> <p><i>Pretend action towards object O</i></p>	<ul style="list-style-type: none"> ▪ Places item (e.g., spoon; spatula) into a container (e.g., bowl, teapot; frying pan), moves the item (e.g., spoon; spatula) towards second container, rotates the item towards/inside the second container. ▪ Obvious rotations, or repetition of the movement with slight rotation – moving item back and forth repeatedly from same/different container (record as one action if continuous movement) and verbalisations can help to code. 	<ul style="list-style-type: none"> ○ Moving item (e.g., spoon) from one container to another with no rotation or verbalisation.
<p><i>Pretend to season</i></p> <p>The child pretends to add salt (or other substance) to play food (e.g., pretend egg, pretend frying pan) using the salt/pepper shaker (W4 ONLY)</p>	<ul style="list-style-type: none"> ▪ Holds, or rotates and holds, the saltshaker with top of the shaker facing downward. Shakes the saltshaker up and down above an object, e.g., frying pan, hand, or over ‘imaginary’ object e.g. imaginary food. If ‘imaginary’, there needs to be clear evidence of the imaginary substance (e.g., via verbalisation). ▪ Verbalisations, e.g., “Put more of this” can help to code. 	<ul style="list-style-type: none"> ○ Saltshaker held with top facing upwards (the rotation helps to distinguish between the child just liking the sound of the shaker/using the shaker to make a noise). ○ Do not code if child rotates the saltshaker and shakes up and down if no recipient of the salt. Recipient should be in view.
<p><i>Pretend to chop/slice/cut</i></p>	<ul style="list-style-type: none"> ▪ Moves the plastic knife towards a piece of play food, moves the knife up and down/back and forth on the play food. 	<ul style="list-style-type: none"> ○ Simply banging the item of play food with the knife.

<p>The child performs the action of pretending to chop/slice a piece of play food with play knife.</p> <p>Pretend action towards object O</p>	<ul style="list-style-type: none"> ▪ Moves the plastic knife to be above a piece of play food, holds the knife in a deliberate and focused manner above the item of food. Knife is held for an exaggerated period above the item of food. ▪ Can code if the coder has evidence of ‘imaginary’, non-existent food. For example, the child approaches a plastic plate and enacts a cutting or chopping motion, or speech/sound effects provide additional evidence of pretending. 	<ul style="list-style-type: none"> ○ Holding the knife above an item which is not play food, e.g., jigsaw piece (unless clear evidence of object substitution). ○ Using the play knife to slice through item (e.g., separating the toy cake pieces joined with Velcro).
<p><i>Pretend to stir</i></p> <p>The child performs the action of stirring in the absence of real food or liquid</p> <p>Pretend action towards object O</p>	<ul style="list-style-type: none"> ▪ Obvious rotation (round and round/back and forth movements) of spoon, spatula (or other kitchen utensil) (as if stirring some ‘imaginary’ liquid) within, or above an object (e.g., cup; bowl). - Verbalisations can help with coding, e.g., “Stirring soup” (Barton, 2007, p. 126) 	<ul style="list-style-type: none"> - Repeatedly hits/bangs edges of the container with the stirring implement, without any rotation. Unless clear verbalisation indicates intention of stirring.
<p><i>Pretend offer(/give)/ Pretend to feed other</i></p> <p>Offers non-existent (e.g., tea) or transformed object (e.g., plastic food as edible food) towards peer; parent; or</p>	<ul style="list-style-type: none"> ✓ Moves cup, teapot or bowl towards adult; peer; inanimate objects “mouth” area. The action is accompanied by a rotation of the item/ hand tilt (of the opening part, as if where liquid would come from) towards the other’s “mouth” area (can still be coded if the item touches the others mouth). ✓ Can be coded if there is no obvious rotation of the item but the cup, teapot or bowl is angled the correct way (e.g., the opening of cup is angled, by the child, downwards towards the recipient’s “mouth”) and additionally held at the recipient’s “mouth” for a duration of two seconds or more. ✓ Moves play food; plate; spoon towards inanimate objects “mouth” area and the item is held (can be moving it around in front of “mouth” area) at the “mouth” area for a duration of two seconds or more. Only with inanimate object. ✓ Moves item, e.g., play food, towards peer, adult or inanimate objects “mouth” area and enacts eating sound effect, e.g., “Yam, yam, yam”, or speech conveys pretend play, e.g., 	<ul style="list-style-type: none"> ○ Pressing play food (or actual food) to another’s mouth with no sound effects or verbalisations. Only code if to an inanimate object’s mouth area and held for two second duration. ○ Examples of exclusions: <ul style="list-style-type: none"> - Offering cake, SP, “This one is for you” (not necessarily any pretend element, could code if

<p>inanimate object (e.g., doll; teddy; jack-in-a-box; aeroplane toy; puppet). Towards “mouth”, or placing next to them</p> <p>If to mouth note as <i>pretend to feed other</i></p> <p>Pretend action towards other OP</p> <p>NB. Mouth area: includes “chin or nose, but not eyes” (Faja et al. 2016, p. 5)</p>	<p>“He’s eating the cake!”. If the child moves an inanimate object towards play food and enacts eating sound effect, e.g., “Yam, yam, yam”, or speech only conveys pretend play then code just as V, here the pretend element is the child verbally attributing animacy to the toy rather than feeding the toy or offering item.</p> <ul style="list-style-type: none"> ✓ Offers/gives item to recipient and speech conveys transformed or ‘imaginary’ substance (can place next to recipient), e.g., offer/give cup to peer and SP, “Cup of tea” (i.e., ‘imaginary’ substance); “Here’s two teas” as gives cups to CG; “Here’s some coffee I fixed for you” (McLoyd, 1980, p. 1135), places cup next to parent. <ul style="list-style-type: none"> - Could be purely non-existent item offer, e.g., SP, “Here’s some sugar” and moves hand up and down above recipient cup (as if adding sugar). - Could be a purely verbal pretend offer of item not physically in the environment, e.g., Holding teapot, SP, “You want milk everyone?”; Holding teapot, SP, “Want cup of tea everyone?” Holding milk jug, SP to caregiver, “Want some more sugar?”; “You need coffee?” – Add code V to transcript ✓ <i>Pretends to pour</i> into cup/milk jug, meeting the coding definitions for <i>pretend to pour</i>, and offers (or gives) to recipient (can place next to recipient). This should be a continuous movement with no other actions performed in between but can include the child trying to stand up / picking up the cup / walking to the recipient with the item. <ul style="list-style-type: none"> ➤ This would be recorded (and counted) as two actions: <i>pretend to pour</i> and <i>pretend offer</i> (e.g., O+OP). Can record on separate or same transcript lines. ✓ <i>Pretends to pour/add</i> into cup/milk jug etc., or over item (e.g., plastic cake) that peer or adult is holding, meeting the coding definitions for <i>pretend to pour</i> (if the cup/milk jug is next to the recipient the action can be coded if the child’s speech indicates that the <i>pour</i> is intended for the recipient, “for Daddy”). <ul style="list-style-type: none"> ➤ Record as two types of actions, <i>pretend to pour</i> and <i>pretend offer</i> (e.g., O+OP) on same transcript line, but count as one pretend enactment. ✓ Performs a grasping action with fingers (often a pincer grip with thumb and forefinger, or tripod grip with thumb, forefinger and middle finger) towards the plastic food (e.g., plastic grapes) (as if grabbing food, e.g., a grape) and moves hand still in grip towards others mouth or hand. ✓ Spoons out; scoops; lifts up with spoon or utensil and moves spoon (or utensil) towards peer, adult or inanimate objects mouth area (record as one action). 	<p>speech implied a transformed/imaginary element).</p> <ul style="list-style-type: none"> - Giving food, SP, “Here’s an orange” (not necessarily any pretend element, could code if speech implied a transformed/imaginary element). ○ Angles the item towards adult; peer; inanimate objects “body” and not towards “mouth” area (unless obvious verbalisations/ speech to indicate pretending). ○ Performing a holding action using the bottom of the teapot/cup. - Exclude if enacted with an item that contained (or still contains) real liquid e.g., the white plastic cups given to the parents.
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<p><i>Object substitution (OS)</i></p> <ul style="list-style-type: none"> ▪ Transforms one object into a different object. <p>“Use of an object as if it were a different object” (Ungerer & Sigman, 1981)</p> <p>One object stands in for another object (Olson & Campbell, 1988)</p> <p>Can include transforming body part into an object.</p>	<ul style="list-style-type: none"> ▪ Can only be coded if: <ul style="list-style-type: none"> A) Child transforms the object/body part and performs an action where the action meets the pretend play operational definitions elsewhere in this scheme, examples: <ul style="list-style-type: none"> - Uses jack-in-a-box toy to <i>pretend to pour</i> - meets coding definition for <i>pretend to pour</i> (e.g., tilts an object above another object) - Uses hand as a telephone to <i>pretend to talk on telephone</i> – vocalises, “Hello” with hand at ear - Pushes connected Duplo bricks along floor vocalises, “Choo, choo”, uses Duplo as if it were a train - meets definition for <i>Acts on an object with accompanying pretend verbalisations</i> - Places party hat to mouth and makes trumpet noises, using hat as if trumpet – meets definitions for <i>Acts on an object with accompanying pretend verbalisations</i> - Moves hands up and down on chest and vocalises musical sounds, using air/chest as guitar – meets definition for <i>Acts on an object with accompanying pretend verbalisations</i> ▪ OR B) Child verbally transforms an object stating the new use, e.g., places bowl on head, SP, “Hat!”; holding Duplo, SP, “Look Mummy, it’s a hairdryer!” and moves up and down on Mother’s head; Child SP, “I’m a robin”, places hat to mouth and SP, “look at my mouth”. Add V code to transcript. ▪ If the action is directed towards a peer; adult; inanimate object record as OP, if directed towards self, record as SP (Zerwas, 2003). ▪ Code as OS and other type of pretend, e.g., would be OS and O if used a jack-in-a-box to <i>pretend to pour</i>. Counted as one pretend enactment 	<ul style="list-style-type: none"> ○ Building and naming constructions, e.g., ‘I did a teddy bear’. (Haight & Miller,1993) ○ Using plastic container/jar (such as one that holds toys) to <i>pretend to drink</i>. This could be a drinking vessel (can be coded as <i>pretend to drink</i> though). ○ Using play food item as a different food item, e.g., grapes as sugar/ jam tart as pizza. ○ Placing party hat on bears foot- unless additional pretend speech. ○ Banging/stirring with hand inside other item. But could be coded as <i>pretend to stir</i> (if there is a rotation etc.). ○ Using the book shaped like a car and attributing sound effects, would just code as V. ○ Using Duplo bricks that have wheels and attributing sound effects, can be coded as V though. ○ Code as <i>possible pretend play</i> if the child uses a miniature item from the tea-set in a different way, e.g., using grapes to pretend to stir.
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<p><i>Verbal pretend play enactment (V)</i> -Verbally attributes absent properties/elements to object or situation</p> <p>The child refers to properties/elements of an object or situation that are not literally present</p> <p>Exaggerated/playful/high pitched tone of voice (Howe et al., 1998) indicates play enactment and helps with coding speech as pretend in the absence of actions</p>	<p>Examples:</p> <ul style="list-style-type: none"> - SP, "It spilled on there!" as an empty cup is knocked over. - Showing cup to researcher, SP, "Teabags" in excited tone. - Hugs self, and SP, "Brrrrrrr". - "I've got a cup of tea here" showing cup to caregiver. - Blows on frying pan, "It's hot!". - SP, "Peel, peel orange" as moves hands back and forth around plastic orange. - SP, "It's finished!", exaggerated voice, after <i>pretends to pour</i>. - SP, "It's a yummy cake", exaggerated voice, holding plastic cake. - SP, "There's water here!" holding the teapot. - SP, "Cakes ready!" exaggerated voice, picking up cake. - SP, "Fire in the kitchen!" looking at the picnic mat. - SP, "No more", "looking at an empty toy bottle" following <i>pretend to pour</i> (Veneziano, 2002, p. 9). - SP, "We're at the store now". (McLloyd, 1980, p. 1136) <p>- Attributes animacy to an object - refers to toy as if animate, talks to a toy as if it is animate, animates the toy to talk/eat etc. (e.g., tone/voice conveys animating - child <u>uses different voice to own/play voice, or, the speech confirms child is talking as the toy, e.g., "Hello, I'm a giraffe" and turns giraffe puppet on hand</u>)</p> <p>Examples:</p> <ul style="list-style-type: none"> - "He's eating the leaves!" holding the zebra puppet toy. - "This teddy bear needs some grapes" holding toy teddy bear. - "This teddy bear is hungry!" pointing at toy teddy bear. - "He wants to bite this" holding zebra puppet. - "He's gone to race" after placing toy figure in toy car. - SP, "Bye bye!" to toy plane. - Makes toy animals growl or roar – extends hand holding toy lion towards other and vocalises, "Roarrrrrrr". - With zebra puppet on hand, holds up hand and SP, "I'm a zebra"/ "I'm going to eat you", <u>using a deeper voice.</u> - SP, "Yam, yam, yam"/ "Nom nom nom" as lowers puppet toy towards play food. 	<ul style="list-style-type: none"> ○ Answering "yes"/ "yeah" to question about absent attributes, e.g., "Have you washed the grapes?"; "Is it tasty?"; "Do you want tea"; "Are you going to be a power ranger?"; "Is he going to put the fire out?" Child replies, "Yes". ○ Pointing at an item, e.g., washing machine or clock and vocalising the noise the item makes without any action: "Round and round!"; "Tick, tock". ○ Statements that could be literal – e.g., "I want some tea" could just be a statement that child wants some tea – if holding teapot and SP, "Do you want some tea" that would be codable. <ul style="list-style-type: none"> - "Now this one is for you" giving a cup to parent - "That's horrible" holding the grapes - "I've got some cakes" showing cake to other child - "Do you want some", holding the grapes - "I don't like melon" - "Can you put water in?"
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<p><i>-Verbal statement of pretend activity</i></p> <p>The child announces a statement of pretend (non-literal) activity as if just done/doing or about to do.</p>	<p>Examples:</p> <ul style="list-style-type: none"> - "I cooked!" holding the frying pan. - "I'm putting out the fire" holding toy hose. - "I'm blowed out the candles" after moved head over the plastic cake. 	<ul style="list-style-type: none"> ○ Speech about the adult dressed in the bear costume – "He's gone to sleep"; "Teddy bear asleep"; "Teddy gone to bed". ○ Descriptive information about the physical properties of inanimate objects e.g., "He's got two ears"; "He's got teeth", referring to the puppet, "He's soft", "He's sitting down" ○ Just moving a toy, if no verbal indication of animacy do not code, e.g., moving a toy up and down may look like enacting the toy to walk but not codable (objectively could just be bouncing the toy up and down). <ul style="list-style-type: none"> ○ Speech about having a picnic, including, "Let's have a picnic"; "I'm having a picnic"; "I want to play picnic".
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<p><i>-Acts on an object with accompanying pretend (non-literal/as-if) verbalisations/sounds/noises</i></p> <p><i>(Sound effects indicate that verbally attributing an absent property to the object)</i></p>	<p>Examples:</p> <ul style="list-style-type: none"> - Pushes/moves an object (e.g., car/toy train along the floor and vocalises engine sound effects, e.g., SP, “Vroom, vroom”, “Choo, choo” as pushes/moves the vehicle. - Moves toy aeroplane through air with screeching, or engine noises, e.g., lifts toy plane into air and vocalises “Neeeeooow”. - Lifts toy aeroplane into the air and shouts, “The aeroplane is taking off!”; “Take off!”; “Blast off!” - “Charlie ... pushed a toy train to accompanying sound effects... ordering ‘all aboard’”. (Haight & miller, 1993, p. 135) 	<ul style="list-style-type: none"> ○ If the child is just pointing to an object and vocalising sound effects, e.g., points to a dog and SP, “Woof, woof”. Child needs to be acting on an object with the sound effects <ul style="list-style-type: none"> - e.g., SP, “Ne na, ne na” pointing at fire truck; there needs to be an action, i.e., moving the object. ○ Presses toy down and vocalises, “Pop”. ○ Looking through book, vocalises sounds of animals in the book, e.g., “Roar” ○ Literal statements while acting on the object e.g., saying “Toy plane is broken”; Pushing toy car, in normal voice, “I’m going to go this way”; “Plane go up”, different to “plane taking off!”
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<p><i>-Role play - verbal announcement of a role/character, or verbal enactment of role/character</i></p>	<ul style="list-style-type: none"> ▪ Child verbally states they are enacting a role / character, examples: <ul style="list-style-type: none"> - SP, "I'm going to be a snail!" and moves along the floor. - SP, "I'm a teddy bear!". - SP, "I'm a doctor". ▪ Child uses speech/sound effects combined with action to enact a role or character, examples: <ul style="list-style-type: none"> - Enacts monkey sounds (SP, "Ee, ee, oo, oo!") and moves arms up and down. - Shouts, "I'm putting out a fire" (Thorp and colleagues, 1995, p. 270) and runs across the room. - Shouts, "Batman!", and runs across the room. ▪ Speaks as if character using different voice to own, "Say thank you to bear" – using deeper voice than own 	

Coder Rating	Rating definition
0	The coder does not observe the action to fit the coding definitions for pretend play.
1	The coder is unsure whether an observed action is a pretend play action. An act of possible pretend play. Possible pretend play acts extend beyond simply mouthing or raising a cup to the lips, but do not fully meet the operation definitions outlined in Table 1. A score of 1 could be awarded for an action where the key coding elements are not fully visible, or the child is not focused on the action but meets other operational definitions. If view is very restricted code as 0.
2	The coder observes the child to perform an act of pretend play (e.g., the action fully meets the coding definitions described in Table 1)

Appendix F

Pretend Play Enactments Included on The Different Modules (Infancy; Toddler & Early Childhood Modules) of the Pretend Play

Observational Coding Scheme

Infancy; Toddlerhood; Early Childhood	Toddlerhood; Early Childhood	Toddlerhood only	Early Childhood only
Pretend to drink	Pretend to spoon food into mouth	Pretend to season	Role Play
Pretend to eat	Pretend to talk on the telephone		
Pretend to pour (pretend to add)	Pretend to sleep		
Pretend to feed other/ pretend offer (peer; adult)	Pretend to spoon a substance from one container to another		
Pretend to feed other/ pretend offer (inanimate object)	Pretend to chop/slice/ cut		
	Pretend to stir		
	Object substitution		
	Verbally attributes absent properties to object or situation		
	Verbal statement of pretend activity		
	Acts on an object with accompanying pretend (non-literal/as-if) verbalisations/ sounds/noises		

Appendix G

Example Transcripts Coded Using the PPOCS-T Using Video Records of Wave 4 (Toddler Assessment) Free Play, Peer Interaction Session

ID: Example 1 Coder:	Focal Child Description from PICS: Date Coded:
Notes: This is not a running commentary, only record instances which are pretend play or possible pretend play (or times when the coder wants to make a note of when an action is not accompanied by enough evidence for pretend play).	

Peer session/Free Play Coding Timing: 00:00:00 – 00.20.00

TIME	OBSERVATION	Type Of Pretend Play Code (SP,O,OP,OS,V)	Pretend Play Rating Scale (0,1,2)
00:06:10	Moves purple toy vehicle along the floor and vocalises, “Nee-oww!”	V	2
00:07:28	Lifts frying pan containing egg to mouth, no evidence of pretend to eat		0
00:07:48	Pretend to add salt to frying pan containing the egg (pretend to season)	O	2
00:07:56	Moves frying pan towards mouth, tilts frying pan and tilts head - pretend to eat/drink from the frying pan	SP	2
00:08:04	Possible rotation of saltshaker over egg; however, restricted camera angle (possible pretend to season)	O	1
00:08:18	Pretend to add salt to frying pan containing the egg, pretend to season	O	2
00:08:27	Holds saltshaker above frying pan containing the egg, pretend to pour - exaggerated hold	O	2
00:09:52	Pretend to add salt to frying pan containing the egg, pretend to season	O	2

Highest level of pretend play: 2

ID: EXAMPLE 2.	Focal Child
Coder:	Date Coded:
Notes: This is not a running commentary, only record instances which are pretend play or possible pretend play (or times when the coder wants to make a note of when an action is not accompanied by enough evidence for pretend play).	

Peer session/Free Play Coding Timing: 00:00:00 – 00:20:00

TIME	OBSERVATION	Type Of Pretend Play Code (SP,O,OP,OS,V)	Pretend Play Rating Scale (0,1,2)
00:05:19	Lifts frying pan containing egg to mouth, vocalises, “Slurp” sound effect. Because of sound effect, pretend to eat.	SP+V	2
00:13:23	SP to everyone, ‘Can I cook?’, kneeling down in front of the toy kitchen.	V	0
00:13:30	Shakes the frying pan, looking towards frying pan. SP, “It’s, It’s not...h, it’s hot!” and smiles towards adults.	V	2 - because of smiling
00:13:39	SP, “Toast in there, it won’t come out.” Factual comment.		0

Highest level of pretend play: **2**

ID: EXAMPLE 3	Focal Child Description from PICS:
Coder: CR	Date Coded:
Notes: This is not a running commentary, only record instances which are pretend play or possible pretend play (or times when the coder wants to make a note of when an action is not accompanied by enough evidence for pretend play).	

Peer session/Free Play Coding Timing: 00:00:00 – 00:16:56 (3) / 00:00:00 – 00:02:56 (4)

TIME	OBSERVATION	Type Of Pretend Play Code (SP,O,OP,OS,V)	Pretend Play Rating Scale (0,1,2)
00:01:30	SP, "Hot" and tilts the frying pan towards face, small tilt of head. Pretend to eat/drink the egg.	SP + V	2
00:01:36	Pretend to drink from frying pan, definite tilt of frying pan.	SP	2
00:01:40	Raises frying pan to mouth, action is not clear. Could just be looking in the pan.	O	0
00:01:44	Pretend to drink from frying pan.	SP	2
00:01:48	Pretend to drink/eat from frying pan.	SP	2
00:02:52	Picks up block, SP, "A toast", Object substitution	OS + V	2 (PI agree verbal OS)
00:04:08	SP, "I cooks!", holding the frying pan, SP, "I cook...I cooks...I cooks" walking around with the frying pan. Verbal statement of pretend activity.	V	2
00:04:14	Possible SP, "A hot" (?) attempting to place the frying pan on the stove.	V	1
00:04:31	SP, "I cooks!", placing frying pan on the stove, "I cooks", Verbal statement of pretend activity.	V	2
00:07:05	Places frying pan on oven hob.		0
00:07:27	Lifts the pan containing the egg to mouth, tilts pan, small tilt of head, pretend to drink from the pan	SP	2
00:07:30	Lowers pan, but still in front of mouth, vocalises pretend eating noises, pretend to eat the egg.	SP + V	2
00:07:31	Tilts pan towards mouth, pretend to drink from the pan.	SP	2
00:10:11	Places frying pan on the oven hob, SP, "[inaudible]".		0
00:02:47	Possible SP, "I read it" as opens the book (it is a children's book with pictures)		0

Appendix H

Example Transcript Coded Using the PPOCS-I Using Video Records of Wave 3 (Infancy Assessment) Free Play Session

ID: Example 1	Date:	Bib:
<p>Notes: This is not a running commentary, only instances which are pretend play or possibly pretend play (or times when the coder wants to make a note of when an action is not accompanied by enough evidence for pretend play).</p>		

Peer session/Free Play Coding Timing:

TIME	OBSERVATION	Pretend Play Rating Code (0,1,2)
00:14:09:	Accepts a "cup of tea" from Mother of Child C, tilts cup towards mouth, pretend to drink. (<u>*Cup rotated approx. 90 degrees towards face and two second duration tilting + lip movements</u>).	2
00:14:24:	Pretend to drink from cup. (<u>*Cup rotates towards mouth for under two second duration, possible lip movement after action</u>)	1
00:14:34:	Pretend to drink from cup (2). (<u>*Head tilts/rotates backwards for duration of two seconds</u>)	2
00:14:42:	Pretend to drink from cup (1). (<u>*Cup rotates towards mouth for under two second duration</u>)	1
00:14:53:	Cup to mouth but no exaggeration.	0
00:15:31:	Raises cup to mouth, mouth moving while cup at mouth, Possible pretend to drink from cup (1).	1
00:15:38:	Cup to mouth but no exaggeration.	0
00:15:45:	Possible pretend to drink from cup (1).	1
00:15:53:	Pretend to drink from cup (2). (<u>*Clear lip movements continue when removes cup from mouth</u>)	2
00:16:12:	Pretend to drink from cup (2). (<u>*Cup rotated approx. 90 degrees towards face + held</u>)	2

00:16:19:	Pretend to drink from cup (2). (<u>*Cup rotated approx. 90 degrees towards face + held</u>)	2
00:16:30:	Pretend to drink from cup (2). (<u>*Cup rotated for duration of two + seconds</u>)	2
00:16:38:	Pretend to drink from cup (2). (<u>*Cup rotated for duration of two + seconds</u>)	2
00:23:19:	Raises cup to mouth, Possible pretend to drink from cup (1).	1
00:26:08:	Pretend to drink from bowl (2). (<u>*90-degree rotation angle, two second+ head tilt duration</u>)	2
00:27:31:	End	

Appendix I

Example Transcript Coded Using the PPOCS-C Using Video Records of Wave 5 (Early Childhood Assessment) Free Play Session

ID: Example 1

BIB: _____ **Date of Birthday Party:** _____

Coder: _____ **Date Coded:** _____

Notes: This is not a running commentary, only instances which are pretend play or possibly pretend play (or times when the coder wants to make a note of when an action is not accompanied by enough evidence for pretend play).

Peer session/Free Play Coding Timing:

TIME	OBSERVATION – pretend play enactment observed	Type Of Pretend Play Code (SP,O,OP,OS,V)	Pretend Play Rating Scale (0,1,2)
10.22	SP, “You want some tea” and moves teacup towards Child A, pretend to offer	OP+V	2
10.32	Offers grapes to Child A and SP, “There you go”		0
11.06	Play food into mouth, followed by exaggerated lip smacking – this lip smacking makes a noise pretend to eat	SP+V	2
11.16	Play food was at mouth and then demonstrates obvious lip movements, pretend to eat	SP	2
11.24	Lifts play food to mouth, SP, “Am”, pretend to eat	SP+V	2
11.30	Play food into mouth, possible noise but not clear that eating noise, possible pretend to eat	SP+V	1
11.34	Lifts play food to mouth, SP, “Am” and “Mmm,mmm” (I think) pretend to eat	SP+V	2
11.40	SP, “Mmm, mmm, mmm” play food not at mouth, verbally attributes absent properties	V	2

11.54	Bagel to mouth, SP, "Am", pretend to eat	SP+V	2
11.55	Bagel to mouth, SP, "Am", pretend to eat	SP+V	2
11.59	Bagel to mouth, SP, "Am", pretend to eat	SP+V	2
12.04	Possible pretend bite towards cake, possible pretend to eat	SP	1
12.47	Leave party room to use the bathroom		
14.30	Re-enters (1.43 MINUTES)		
15.05	Pretend to pour from teapot	O	2
15.16	SP about "tea" but not clear what referring to and camera turns off briefly, so the screen is black		0
15.26	Pretend to pour – finish 15.32	O	2
15.32	Give cup to CG – pretend to offer following pour	OP	2
15.45	Pretend to pour with teapot quiet, "Sss" vocalisation – finish 15.48	O+V (1)	2
15.49	Reach for milk jug		
15.51	Hold milk jug above same cup as previous action, pretend to pour – 15.54 – first hold finished	O	2
15.56	Pretend to pour from teapot into same cup with, "Sss" vocalisation	O+V	2
16.03	Out of camera shot, but I can hear the adult accepting the cup and drinking – within 5 seconds of last action but out of camera shot so possible pretend to offer	OP	1
16.13	Asks the Adult, "Sugar on it?" possibly verbally attributing item not in the environment, possible verbal offer – is looking towards adult but not clear verbal offer	OP+V	1
16.15	Pretend to pour from teapot, possible sound effect- but strange- sounds like video noise	O	2
16.19	Pretend to pour from milk jug into the same cup as previous action	O	2
16.23	Pretend to pour from teapot into same cup with, "Sss" vocalisation	O+V	2
16.25	Pretend to pour from milk jug into same cup with, "Sss" vocalisation – finish 16.28	O+V	2
16.35	Offer cup towards adult, SP, "Here", and gives cup (16.36) continuous movement, pretend to offer	OP	2

17.31	Pretend to pour from teapot into different cup	O	2
17.35	Play food into mouth, possible eating sound effect, possible pretend to eat	SP+V	1
18.00	SP, about zebra puppet in high pitched tone, but speech unclear – possibly about “teeth” from what the parent says		0
18.04	Bouncing zebra puppet up and down along the sofa, possible high-pitched sound – possible acts on object with pretend sound	V	1
18.09	SP, “I gonna eat you”, with zebra puppet on hand and uses deeper voice Verbal pretend play – attributes animacy	V	2
18.16	SP, “I gonna eat your finger” as moves zebra toy to CG finger - using a deeper voice Verbal pretend play – attributes animacy	V	2
18.18	Uses puppet toy to “bite” CG finger and SP, “Am”, “mmm”, “mmm” Verbal pretend play – attributes animacy	V	2
18.29	Using puppet toy to “bite” own finger, SP, “Ooo yucky” Verbal pretend play	V	2
18.48	SP to C “I having a tea party”		0
18.51	SP to B “Do you have grapes?”		0
18.57	Lifts melon to mouth and SP, “Am, “Mmm” pretend to eat	SP+V	2
19.27	SP to B, “This is grapes”- “You have to pretend”!	V	2
20.17	With puppet toy on hand SP, “I gonna go to sleep”- uses a different voice to own Verbal pretend play – attributes animacy	V	2
20.28	Bounces puppet up and down in the air, unclear speech		0
20.47	Places CG finger in puppet mouth		0
20.53	Holding puppet, looking at puppet toy, vocalises “Mmmm” – Verbal pretend play – attributes animacy (with previous action)	V	2
21.00	SP, “Got to go now” with puppet on hand, not clear whether speaking as the puppet/speaking to the puppet/or speaking to CG – no change of tone of voice – possibly verbal pretend play but not clear	V	1
21.09	Shaking puppet toy as if waving, I can possibly hear SP, “Bye bye”, but speech is very quiet – not certain	V	1 – because speech is quiet
21.10	Bounces puppet toy up and down along sofa - no speech		0
30.53	END		

Appendix J

Number of children displaying each type of pretend play during the Infancy, Toddlerhood and Early Childhood assessments

Pretend play type	Assessment time point		
	Number of children displaying at least one enactment of that type of pretend play		
	Infancy (% of children who showed any pretend play / % of full sample of children observed)	Toddlerhood (% of children who showed any pretend play / % of full sample of children observed)	Early Childhood (% of children who showed any pretend play / % of full sample of children observed)
Pretend action toward self (e.g., pretend to drink; pretend to eat)	46 (78% / 18%)	33 (54% / 19%)	100 (54% / 51%)
Pretend action toward object (e.g., pretend to pour; pretend to stir)	20 (34% / 8%)	25 (41% / 14%)	123 (66% / 62%)
Pretend action toward other (e.g., pretend to feed other)	13 (22% / 5%)	10 (16% / 6%)	111 (60% / 56%)
Object substitution	N/A	9 (15% / 5%)	22 (12% / 11%)
Any verbal pretend play enactment	N/A	40 (66% / 23%)	166 (89% / 84%)

Note. Verbal pretend play enactments include where the verbal enactment ‘duplicates,’ ‘specifies’ or ‘creates’ the pretend play, see section 2.1.3.3; for example, the verbal enactment could ‘duplicate’ the coding of a different category of pretend play, e.g., child pretends to drink with exaggerated tilt (pretend action towards self), accompanied by a slurp (verbal pretend play enactment), or the verbal enactment could be considered to be the pretend enactment, e.g., child runs across the room and shouts, ‘I am batman’!