A Cognitive Functional Account of Pure Intransitive Classification

Lucy Chrispin

Thesis submitted in partial fulfilment of the degree of
Doctor of Philosophy

Centre for Language and Communication Research

School of English, Communication and Philosophy

Cardiff University

December 2021

Abstract

This thesis explores the classification of pure intransitives by investigating their grammatical patterning and semantic descriptions. Pure intransitives are defined in this work as one participant constructions that lack a direct object or any transitive alternate. To achieve a broad understanding of pure intransitive classification, three studies were carried out in a multi-faceted approach. Overall, 2950 instances from the Corpus of Contemporary American English (Davies 2008-) were analysed using Corpus Pattern Analysis (Hanks 2004a), and grammatical and lexical aspectual analysis.

The first study provides empirical evidence for a category of pure intransitive verbs that represents physiological and psychological experiences (e.g., *coughing, crying*), collectively referred to as Behaviours in this work. The results reveal consistent lexico-grammatical features across the verbs (animacy, situation type, intransitivity, perfective aspect), confirming that there is a case to argue for Behaviours as a verbal category.

The second study explores the extent to which Behaviours can be empirically differentiated from another pure intransitive category, one representing actions and happenings (e.g., *walking, competing*). This second category is referred to as 'Intransitive Actions'. Collectively, lexical aspect and animacy are the best predictors in distinguishing between the two verb categories. These results suggest two sub-types of pure intransitives: instances with activity or semelfactive situation type and animate subjects (Behaviours); and instances with accomplishment or culmination situation type and/or inanimate subjects (Intransitive Actions).

The final study empirically determines what lexico-grammatical properties and semantic description can be associated to the pure intransitive construction. Results reveal an inherent activity meaning of pure intransitives, with extended meanings of other situation types (e.g., accomplishment). Verbal semantics, participant animacy, and elements in the post-verbal part of the pattern are prominent influences on the aspectual meaning of the intransitive.

This research concludes that dynamicity and durativity are significant features of the intransitive construction. The bare intransitive construction has an inherent activity meaning, with extended meanings depending on various clausal elements.

Acknowledgements

Firstly, I would like to wholeheartedly thank my supervisor, Dr Lise Fontaine, for everything she has done for me over the past six years. It was during Lise's Functions of Grammar module that I first became interested in grammar and without her encouragement I would have never even considered doing a PhD. I am so grateful for Lise's continuous support, kindness, guidance, ideas and constructive criticism throughout this whole experience, not to mention the effort she has made to provide me with other academic opportunities, such as research visits and publications. I could not imagine or wish for a better supervisor.

Thank you to the ENCAP staff who have also supported me since my undergraduate years. I would like to give a special mention to Prof Gerard O'Grady, Dr David Shönthal, Dr Andreas Buerki and Dr Katy Jones, for their continuous inspiration and encouragement. I also owe thanks to Dr Sean Roberts for support in statistics and Dr Michelle Aldridge-Waddon for her valuable comments on a final draft chapter.

I am also incredibly grateful to staff outside of Cardiff University who I have had the pleasure to collaborate with and learn from. Thank you to Prof Kristin Davidse for being so hospitable and supportive during my research visit at KU Leuven. It was an enriching and memorable experience that enhanced my research in many ways. Thanks also to Prof Patrick Hanks for meeting on several occasions for engaging discussions, including a welcoming research trip that helped me to develop my analysis skills for this thesis.

I would like to express my thanks to the Economic and Social Research Council (ESRC) for funding this 1+3 project and providing me with this opportunity.

To my PhD peers – Alex Carr, David Griffin, Dorottya Cserző, Kate Barber, Kayeryna Kryoniuk, Marine Furet. I am so grateful for the experiences we shared in Cardiff before COVID-19 split us up. A special thanks to Alex Carr for answering my endless questions, giving a second eye to my analysis, and co-organising 'Nominal Group Group' with me.

My appreciation goes out to all my wonderful friends who I can't thank enough for their encouragement, love, fun and distractions. There are too many to name, but you know who you are.

Finally, a huge thank you to mum, dad and Harry for their endless love, care, praise, reassurance and financial support. I am so lucky to have you.

Contents

List of Tables

List of Figures

Abbreviations

COCA	Corpus of Contemporary American English
CPA	Corpus Pattern Analysis
CQL	Corpus Query Language
KWIC	Key Word In Context
NP	Noun phrase
PDEV	Pattern Dictionary of English Verbs
PP	Prepositional phrase
SFL	Systemic Functional Linguistics
TNE	Theory of Norms and Exploitations
V	Verb

1. Introduction

In English, verbs are typically categorised as transitive (e.g., *The girl threw the ball*) or intransitive (e.g., *The girl coughed*), depending on features such as their ability to occur with a direct object and to be made passive. However, as with many aspects of language, the classification of (in)transitivity is not as straightforward as it might at first seem. This dissertation will contribute insights to some aspects of the intransitive classification by focussing on what are called pure intransitives and exploring how semantic features, when combined with grammatical patterning, reveal a more precise classification.

The transitivity system in English has traditionally been concerned with the presence or absence of object complements within a clause (Huddleston and Pullum 2002, p.216; Kemmer 2003, p.277). Before summarising transitivity, it should be made clear here that this thesis considers transitivity as both a semantic and syntactic feature of a word/clause, and will refer to both aspects. There are three main transitivity types, intransitive, (mono)transitive[1] and ditransitive, and these terms are used to classify both verbs and clause constructions (Huddleston and Pullum 2002, p.53). Whilst the semantic classification of transitives and ditransitives are well-grounded in the literature, the semantics of pure intransitives (those without a transitive alternate) are relatively under-studied in comparison, and this research aims to fill this gap.

To summarise transitive constructions first, a transitive construction has two core participants, the subject and direct object, for example 'the girl' and 'the ball' respectively in *The girl threw the ball*. It can be passivized when the direct object of the active construction becomes the subject of the passive construction (Dixon and Aikhenvald 2000b, pp.2–6; Wardhaugh 2003, p.124; Dryer 2007, p.250). Semantically, transitives represent a process going across from one participant to another (Hopper and Thompson 1980, p.253; Huddleston 1984, p.190) and it is the direct object that completes the clausal meaning (Walton 1965, p.187; Thorne 2008, p.8). For example, in (1) the action of *killing* is transferred from the first participant, *Ed,* to the second, *Bill*.

---

[1] The term 'monotransitive' is sometimes used to represent clauses with two core participants (Huddleston and Pullum 2002, p.53), however I will use 'transitive' in this thesis.

(1)   Ed killed Bill (Huddleston 1984, p.190)

Ditransitive clauses have three core participants – the subject, direct object and indirect object (Huddleston and Pullum 2002, p.244). Semantically they present a possessive or cognitive transfer of something, such as *giving* or *teaching* respectively (Haspelmath 2015, p.20), where the direct object is the participant being transferred and the indirect object is the goal or benefactive of the object (Wardhaugh 2003, p.90). It is possible for the indirect object to be omitted with some verbs, such as *her* in example (2). Alternatively, the indirect object can often be included in a prepositional phrase, headed by *to* or *for*, in an alternative clausal arrangement (see example (3)). This alternate ditransitive construction is said to be "mandatory when the direct object is a pronoun" (Wardhaugh 2003, p.90; see example (4))[2].

(2)   He left (her) a lot of money (Wardhaugh 2003, p.91)
(3)   He left the money to her (Wardhaugh 2003, p.91)
(4)   He left it to her / *[3]He left her it

The ditransitive construction can be passivized, where either object (direct or indirect) can be the subject of the clause, such as *the money given to the man by me* or *the man was given the money by me* (Wardhaugh 2003, p.125).

Moving onto pure intransitives, though they have a relatively clear syntactic description (i.e., a single participant construction that lacks a direct object or any transitive alternate), their semantics is less well-defined, except for general agreement that these instances involve the conception of an internally caused experience (Smith 1978a, p.107; Levin and Rappaport Hovav 1995, p.91; Davidse 2011, p.23). We will review these intransitive criteria in greater detail in the next chapter.

Whilst the summary above has considered the traditional transitivity system, the concept of transitivity was extended by Halliday (1985/94) in his theory of Systemic Functional Linguistics (SFL)[4]. His system of transitivity broadens the traditional focus on the number of verb participants by considering both semantic and syntactic information about the whole

---

[2] Although, the alternative double-object construction *give it me* is used as a valid alternative alternation in certain dialects of English (cf Gerwin 2013).

[3] Asterisks are used to represent ill-formed examples.

[4] See section 2.2 for a detailed account of SFL.

clause, including the process (expressed by the verb), participants (nominal groups) and circumstantial elements (e.g., adjuncts). SFL offers a useful starting point for exploring both the form and meaning of pure intransitives because it is the only framework that includes a category dedicated to a specific type of pure intransitive clauses – 'the behavioural process'. The process types as represented within SFL will be explained in detail in section 2.2.1 but for now we will only focus briefly on the behavioural process, which is said to represent physiological and psychological behaviours such as *he laughed* or *she is coughing* (what I shall label 'Behaviours' – see section 1.3). However, the classification of this process type is not always clear cut and it can have fuzzy boundaries, or in other words, is indeterminate in nature (Halliday and Matthiessen 1999). For example, the semantics of the participants (or arguments) as well as syntactic features of the behavioural process overlap with other process types, such as the material (action) process, as will be explained further in section 1.2 below.

Before delving too far into the details behind intransitive categories and indeterminacies, section 1.1 introduces the aims of this research. The aims are outlined here to contextualise this research for a clearer understanding of the specific motivations behind these aims (see section 1.2).

1.1 Aims of this dissertation

As I will show in what follows in section 1.2, as well as in Chapter 2, there is little known about the meaning of pure intransitives and they are often indeterminate. Therefore, the overall aim of this dissertation is to explore the classifications of pure intransitive clauses. To achieve this overall aim, there are three sub-aims:

1. To empirically evaluate the extent to which intransitive behavioural verbs exhibit sufficiently similar semantic and lexico-grammatical features which justify the Behavioural categorization.
2. To examine whether Behaviours can be empirically differentiated from Intransitive Actions (another type of 'pure' intransitive category).
3. To determine empirically what lexico-grammatical properties and semantic features can be associated to the 'pure' intransitive construction.

Each of these three aims will be explored in three consecutive studies (see section 1.4); the first aim is addressed in the 'Behaviours study' in Chapter 3, the second aim is addressed in the 'Intransitive Actions (IA) study' in Chapter 4, and the final aim is addressed in 'Intransitive study' in Chapter 5.

1.2 Motivating this research from current intransitive classification

This section details the main motivations behind this research and establishes the need to investigate intransitive classification further, drawing on Halliday's (1985/94) theory of Systemic Functional Linguistics (SFL), Levin's (1993) verb classifications, and the Collins COBUILD verb patterns (Francis et al. 1996). These approaches are addressed because they provide various ways in which intransitives are classified, revealing the gaps, overlaps and inconsistencies in current intransitive classification.

As stated above, SFL extends the traditional transitivity system by considering semantic and syntactic information about the whole clause in a multifunctional approach. One strand of meaning in the clause, the experiential metafunction, captures how experience (i.e., the "goings on" of the world) is construed lexico-grammatically in terms of six different 'process types' (Halliday 1994, p.106). Aspects of these process types, particularly the intransitive behavioural process, are explored below. As Halliday and Matthiessen (2014, p.333) state, "It is true that, from one point of view, all these types of process are different. Material, behavioural, mental, verbal, relational and existential processes each have a grammar of their own." Whilst the main lexical verb is generally the primary identifier of the process type, surrounding participants are crucial in determining their categorisation and analysis. For example, *thinking* occurs as a behavioural process in example (5) and as a mental process in example (6) and this distinction depends on clausal features such as the type of participant configuration, progressivity, ability to take *that*-complements (e.g. *They think that we're stupid*).

(5)   Be quiet! I'm thinking (Halliday 1994, p.139)
(6)   They think we're stupid (ibid)

The intransitive participant configuration, progressive aspect and inability to take a *that*-complement in (5) suggests a behavioural process, with a 'Behaver' participant as the subject. The transitive clause, simple present tense and possibility of a *that*-complement following the

verb in (6) indicates a mental process, where the subject *they* represents a 'Senser' whilst the second participant *we're stupid* represents the 'Phenomenon' i.e., the thing being sensed.

However, establishing the boundaries of these process types can be challenging, sometimes resulting in borderline cases of process types that are difficult to classify. The lack of clear boundaries in language systems and language categories is termed 'indeterminacy' in SFL (Halliday and Matthiessen 1999, p.547). While there is no claim that all clauses fall neatly into one category or another, category indeterminacies or ambiguities are prevalent and can cause uncertainty in analysis. Analyst uncertainty "leads to inconsistent interpretations" which is problematic if the analysis does not truly represent the "semiotics of the message" (Gwilliams and Fontaine 2015, p.3). Inconsistent interpretations are also a result of inconsistent SFL literature, where "the authors differ somewhat in the criteria used to classify process types" (O'Donnell, Zappavigna and Whitelaw 2009, p.1).

As stated above, SFL is a particularly useful theory in exploring the nature of intransitives because it offers a category dedicated to one semantic type of pure intransitive clauses, the behavioural process, which (to the best of my knowledge) is not provided by other theories. However, of the six process types identified within the SFL framework, the behavioural process presents the greatest difficulties since it is particularly challenging to identify and analyse due to having "no clearly defined characteristics" (Halliday 1994, p.139) to distinguish it from the remaining five process types. Its hybrid nature means that we find an overlap with respect to shared similar features associated to material (actions and happenings) and mental (inner consciousness) processes. As defined by Davidse (2017, p.81), behavioural processes "construe an external ('material') perspective on processes of consciousness". The behavioural process type is typically expressed by a pure intransitive clause with a single animate participant, the Behaver, as the Subject of the clause. Depending on the type of experience represented by a given clause, the Behaver may share semantic features with the first participant of a mental process (Senser) or the first participant of a material process (Actor). A clear example of the overlap in features is found with the verb *watch* which is considered a typical behavioural process in SFL (Halliday 1994; Davidse 2017) due to its status as a verb of perception (so mental-like), yet is highlighted as anomalous since it is transitive in nature and has a complement structure that distinguishes it from mental processes (Halliday 1994, p.139).

Despite the anomalous status of *watch*, behavioural processes are viewed as an intransitive configuration, which makes behavioural processes an ideal focus for a better understanding of the intransitive construction. However, they are not the only type of pure intransitive. The material process includes those processes which construe action, doing or happening. Within this category, we find the full range of transitivity, including intransitive, transitive and ditransitive material processes. Intransitive material processes are particularly similar to behavioural ones in terms of their lexico-grammatical configuration, since, in addition to both being expressed by intransitive clauses, they are also typically found in the progressive *-ing* form in the present tense, which is a feature exclusive to material and behavioural processes, excluding for example mental processes. A consequence of these shared features is that there are no distinguishing grammatical features between the intransitive material process of *jumping* (see Figure 1-1) and the behavioural process of *dancing* (see Figure 1-2) outlined by Halliday and Matthiessen (2014, p.333). Both examples have an animate subject, both express a type of motion event and they each have at least one circumstantial (adjunct) element. Thus, the similarities in the two process types raise questions not only about Halliday and Matthiessen's claim above that each process has a grammar of its own, but also the extent to which these types of clauses are similar (we return to these examples in Chapter 4).

The two creatures	had been jumping about	like mad things	all this time
Actor	**Process: material**	**Manner: comparison**	**Extent: temporal**

Figure 1-1: An example of an intransitive material process in Halliday and Matthiessen (2014, p.333)

We	can dance	without lobsters
Behaver	**Process: behavioural**	**Accompaniment: comitative**

Figure 1-2: An example of a behavioural process in Halliday and Matthiessen (2014, p.333)

However, the criteria of behavioural processes, as with the other process types, have largely been based on theoretical assumptions which have yet to be established empirically. Such stark overlap, as shown with Figures 1-1 and 1-2 above, exposes the categories as theoretically flawed. Empirically established criteria would address the inconsistencies between SFL authors as outlined above by O'Donnell et al. (2009, p.1). Examples found in the literature that are used to justify the theory are often prototypical (Tucker 2014, p.402) or invented and bizarre (Hanks 2013, p.307; Banks 2015, p.24). Given the lack of empirical evidence to support the

need for the behavioural category, a closer examination of the category (see Chapter 3) is needed before attempting to establish a broader category of an intransitive construction.

Different perspectives from different approaches lead to examining the verb and/or its clausal environment in different ways. While SFL has grouped physiological and psychological experiences into one category, other approaches have the representative verbs in various different categories. For example, Levin (1993) presents 48 verb classes and eight alternation categories based on the alternations in which verbs can occur, and intransitive physiological and psychological verbs are found in a variety of these classes. These verb types, as well as intransitive verbs more generally, are typically described with an animate subject and have the ability to attach prepositional complements, though intransitive classes are not labelled explicitly and are only identified through the descriptions provided under each class. As with most classifications or taxonomies, some intransitive verbs fit neatly within these verb classes, whilst others are borderline, and some are even highlighted as exceptions to the classes in terms of their lexico-grammatical features. As stated above, physiological and psychological verbs are not classified according to one specific category. For example, if we take a typical verb from the behavioural process category, such as *sneeze*, we see that it shows up in the 'hiccup verb' class and 'verbs of non-verbal expression'. Thus, the semantics and grammatical nature of these verb types means a given verb can be located in various places. We return to Levin's work in detail in section 2.3.

Other classifications, such as Francis, Hunston and Manning's (1996) collection of verb patterns, focus on the grammatical patterning of verb usage. Whilst Francis et al. (1996) outline the verb classes that occur within the patterns, emphasis is on how the verbs are used grammatically as opposed to the sematic nature of pure intransitives. For example, 24 verb meaning groups are described as occurring in the pattern *V* (the bare intransitive without any complements). Physiological and psychological experiences are distributed across various intransitive patterns as well as various meaning groups, for example *laugh* occurs in patterns *V* (in the laugh group), *V at n* (in the gasp group), *V with n* (in the remonstrate group) etc., (we re-visit this work in section 2.1.3).

Thus, there has not been any specific consideration for the intransitive pattern and semantics combined in alternative approaches to SFL, especially in relation to physiological and psychological experiences. For this reason, I will take the behavioural process in the SFL

framework as the point of departure to empirically investigate these types of intransitives. Whilst the research presented in this thesis is influenced by the behavioural process type within SFL, I will be drawing on approaches and methods outside SFL in the pursuit of clearer semantic and lexico-grammatical classifications of the intransitive construction. Therefore, a slight terminological shift is needed so that it is clear that we are not restricted to the more limited concept of the behavioural process from SFL. To capture this broader perspective of physiological and psychological experiences, the term Behaviour (capitalised for clarity) will be used. In what follows, I provide a detailed description of what is captured by this Behaviour category.

1.3 Definition of a Behaviour

While the proposed term 'Behaviour' in this study does include verbs from the behavioural process in the SFL framework, the kinds of verbs and clauses of interest to us here are also discussed by different scholars and different theoretical frameworks in a variety of ways. It would not be useful to use SFL terminology when we want a broad perspective on the nature of pure intransitives and therefore this section draws on different approaches to clarify what will be meant in this work by the term Behaviour. The detail concerning the features and properties of pure intransitives will be discussed in depth throughout the thesis.

As already noted, Behaviours are typically intransitive clauses that represent physiological and psychological experiences such as *coughing, crying, laughing* etc. They have one Subject participant labelled the 'Behaver' (Halliday 1994, p.139) that must be animate, meaning that it is an entity that has consciousness (Levin 1993; Martin et al. 1997; Halliday and Matthiessen 1999; Eggins 2004; Bartlett 2014; Halliday and Matthiessen 2014). However, although technically still intransitive, occasionally a second participant follows the verb, such as in a cognate object or reaction object construction (see sections 2.3.1 and 3.1.2 for more detail). In a cognate object construction the cognate object derives from the verb (Sailer 2010, p.192), whilst the object in the reaction object construction denoted a reaction (Levin 1993, p.98). Examples are shown in (7) and (8) respectively.

(7)   Paul laughed a cheerful laugh (Levin 1993, p.219)
(8)   She laughed her excitement (ibid)

The intransitive nature of Behaviours distinguishes them from transitive experiences (such as mental ones, introduced above) where they do not incorporate a secondary clause within the primary clause using a *that*-complement (Levin 1993; Halliday 1994, p.139; Halliday and Matthiessen 1999, p.136)[5]. For example, *Ellen talked* does not allow **Ellen talked that the party was tomorrow* (Levin 1993, p.208). Despite being intransitive, the Behavioural types of verbs do seem able to take a certain kind of complementation; adjuncts often add information to the clause, typically as prepositional complements (Levin 1993). Adjuncts most commonly indicate how the Behaviour occurs (see example (9)) or what the Behaviour concerns (Eggins 2004, p.234; Halliday and Matthiessen 2014, p.302).

(9) He coughed weakly (COCA FIC:Analog)[6]

Behaviours can also be distinguished from most transitive experiences by their grammatical aspect; in the unmarked present tense, Behavioural verbs typically occur in the progressive (i.e., continuous) aspect using the *-ing* form[7], for example *he is sneezing* as opposed to *he sneezes* (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Eggins 2004, p.234; Leech 2004, p.24; Langacker 2008, p.148). However, whilst the grammatical aspect of Behaviours differs from most transitive experiences (e.g., mental or verbal that occur in the simple present form), this is not a distinguishing factor from transitive actions. Action experiences are the only other category to include pure intransitives, showing that intransitives more generally occur in progressive aspect.

Although the semantics of intransitives is relatively under-studied (as established above), the semantics associated with behavioural verbs in the SFL framework can be used to develop a semantic description of the particular intransitive category under study in this thesis. As shown in section 1.2, Davidse's (2017, p.81) defines behavioural processes as construing "an external ('material') perspective on processes of consciousness" or as Halliday and Matthiessen (2014, p.215) put it, they represent the "outer manifestations of inner workings, the acting out of consciousness … and psychological states". For example, *coughing* involves an 'outer manifestation' of a physiological process ('inner workings'), whilst *laughing* displays the

---

[5] These are regarded as a type of sentential complement in Levin's (1993) work, and a projection in SFL (Halliday 1994).

[6] This citation refers to the source of the example from the Corpus of Contemporary American English (COCA). The genre is fiction ('FIC') and the domain is 'Analog'.

[7] Halliday (1994, p.139) refers to this tense as 'present-in-present', though the more familiar term progressive will be used in this thesis.

'acting out of consciousness'. Whilst Levin (1993) does not explicitly categorise a set of Behavioural verbs, she presents several semantic classes that include these verb types in her classification, such as 'peer verbs'; 'talk verbs'; 'chitchat verbs'; 'verbs of bodily processes' etc. We return to these classes in section 2.3.1. The following section outlines two criteria that might be considered as features of Behaviours (for example within SFL) and justifies why they were excluded from this definition of Behaviours.

1.3.1   Some exclusions to the Behaviour definition

In SFL, behavioural processes can occasionally report speech, but in highly restricted ways (Halliday and Matthiessen 1999, p.136). Instances of reported speech are considered a blend of the two process types - behavioural and verbal (defined in section 2.2.1 in more detail). There is a fixed order to these constructions as the direct speech precedes the process (Bartlett 2014, p.71), with the structure *[quote] V* (example (10)) as opposed to *V [quote]* (example (11)). According the SFL, example (10) is a Behavioural process reporting the speech *I feel a little queasy*. Example (11) shows the restricted nature of these clauses where it is ungrammatical to structure the process before the quotative.

(10)   "I feel a little queasy", she frowned. (Bartlett 2014, p.71)
(11)   *She frowned "I feel a little queasy".

However, the ability to quote in restricted ways will not be regarded as a criterion in this definition of Behaviours for the following reasons. Firstly, these reporting instances are more like instances of metonymy for verbal experiences as opposed to Behaviours, where the manner of speaking is substituted for the actual speech process (Bartley 2017, p.61). For example, the clause in (10) is used metaphorically as opposed to someone literally frowning words. Categorising these metaphorical instances as behavioural processes is problematic and "should…be reconsidered" (Bartley 2017, p.61). These instances of reporting speech are specific to particular types of verbs rather than a reflection of the general category. For example, *"kiss me" she breathed* (Halliday 1994, p.139) and *"I feel a little queasy", she frowned* (Bartlett 2014, p.71) are plausible, whilst *"kiss me" she listened /stared/talked* are not. Additionally, these *[quote] V* constructions are specific to written language, in particular written narratives (Martin et al. 1997, p.126) and are not features of spoken language. For these reasons, the quotative function is disregarded as a criterion for Behaviours.

Volition is another potential criterion for Behaviours, though descriptions and definitions differ to such an extent that both volitional and non-volitional experiences were included and so neither one nor the other was considered as a feature. For example, some scholars regard Behaviours as typically involuntary (Downing and Locke 2006, p.152), and others as the voluntary counterparts to involuntary mental experiences (Banks 2015, p.24). For example, the Behavioural experience *listening* is the voluntary counterpart to *hearing* (Eggins 2004, p.250; Thompson 2004, p.103). Additionally, there are different interpretations in the literature concerning the (in)voluntary nature of specific Behavioural experiences. For example, the experience of *laughing* is regarded by some as an involuntary reaction to something funny, which cannot be controlled (Francis et al. 1996, p.11; Tawa 2009, p.373; van Gelderen 2019, p.220), yet others regard the experience as a controlled process by the person laughing (Perlmutter 1978, p.162; Smith 1978b, p.107; Kuno and Takami 2004, p.9; Banks 2015). The topic is much disputed and certain research suggests both voluntary and involuntary forms of laughter (Keltner and Bonanno 1997; Ruch and Ekman 2001; Gervais and Wilson 2005). We return to these discrepancies of (in)voluntary Behaviours in section 3.1, but the fact that there is such variation within the literature means volition is disregarded as a criterion for Behaviours. Now the aims, motivations, and particular key concepts have been established, the following section outlines the structure of this dissertation.

1.4 Structure of this dissertation

This chapter has provided a brief overview of the thesis, including the aims and motivations of the research. Section 1.3 has defined the 'Behaviours' intransitive category, which is the point of departure for investigating pure intransitive classifications. The following chapter presents a broad review of intransitivity and verbal categorization, situating Behaviours in different approaches. Section 2.1 provides an account of intransitivity, comparing pure intransitives with ergative constructions, and also considers classifications of intransitive verb types and intransitive constructions or patterns. Section 2.2 presents the theory of Systemic Functional Linguistics (SFL; Halliday 1994), section 2.3 presents Levin's (1993) classification of verb classes and alternations, and section 2.4 presents the classification of lexical aspect (aktionsart)[8]. These approaches all incorporate semantic perspectives and consider the

---

[8] Note that lexical aspect can be used as both a theory and method in one, and it plays a major role in all parts of this thesis. Whilst an overview of aspectual theory is provided in Chapter 2, it is then implemented as part of the methodological analysis in Chapters 3-5.

interplay of the verb and its grammatical environment to some extent. Section 2.5 concludes the intransitive review of the second chapter.

As established in section 1.1, Chapters 3-5 present three individual studies that address each of the three sub-aims consecutively. The 'Behaviours' study is presented in Chapter 3 and concerns the nature of Behaviours. Section 3.1 discusses literature on the indeterminate nature of Behaviours from different perspectives, flagging the ambiguities and lack of empirical evidence for the lexico-grammatical features of this category. Section 3.2 presents the methodological approach of the Behaviours study, in which data from the Corpus of Contemporary American English (COCA; Davies 2008-) is analysed using Hanks' (2004a) Corpus Pattern Analysis (CPA) and grammatical and lexical aspect. Results are presented in section 3.3 in relation to typical grammatical patterning and semantic description of the Behavioural verbs, as well as the lexico-grammatical features of Behaviours. Section 3.4 provides a discussion of the polysemic nature of Behavioural verbs, as well as their prototypicality within this category. This investigation into Behaviours is a reflection of the nature of SFL's Behavioural processes, and it is intended that the main concepts and results can be applied to SFL theory. As well as SFL theory, this investigation has applications to the nature of Behaviours as a group more generally, for example in relation to verb classes such as in Levin (1993). Finally, section 3.5 concludes this exploration of Behaviours, pointing to a gap in the research concerning a comparison with 'Intransitive Actions'.

Chapter 4 presents the Intransitive Actions (IA) study, which compares the verbal categories Behaviours and Intransitive Actions. Section 4.1 reconsiders pure intransitive verb categories and provides a description of Intransitive Actions, which are theoretically similar to the Behaviours category. Section 4.2 explores the lexico-grammatical similarities of Behaviours and Intransitive Actions, justifying the need for stronger evidence to warrant two distinguished categories of their own. This IA study adopts a similar methodological approach to the Behaviours study and uses CPA and aspectual analysis to identify the lexico-grammatical features of the two verb categories (see section 4.3). Statistical analyses (including Phi co-efficient, Cramer's V, Chi-squared and Fischer exact tests) are also implemented to directly compare each feature. Section 4.4 presents the grammatical patterning and semantic description of each verb from the CPA results. Section 4.5 reveals the similarities and differences between the lexico-grammatical features of both categories, establishing the two as separate categories. The discussion in section 4.6 considers the set of lexico-grammatical

features collectively, identifying the most predictive features in differentiating the two verb categories, and explores a re-classification of these intransitives. Finally, section 4.7 concludes the exploration of Behaviours and Intransitive Actions, pointing to a gap in the research concerning pure intransitive patterning more generally. In terms of SFL, this chapter sheds light on the similarities and differences between behavioural and intransitive material processes.

Chapter 5 presents the Intransitive study, which investigates the inherent temporal meaning (in relation to lexical aspect) of pure intransitive constructions more generally. The Behaviours and IA studies established the pure intransitive patterns and also revealed the situation types of each instance in the data of Behaviours and Intransitive Actions. Section 5.1 recaps the notion of intransitivity, and section 5.2 motivates the investigation of pure intransitives in relation to lexical aspect. This section acknowledges current research in this area, especially in relation to unaccusativity (or ergativity), and justifies the pursuit of further investigation. Section 5.3 presents the methodology of this Intransitives study, which makes use of previous data and analyses to reveal the variation in situation types of specific intransitive constructions. The results outline the situation types of general pure intransitive patterns (see section 5.4) as well as the situation types of verb-specific intransitive patterns (see section 5.5). Discussions shed light on the extent to which lexical aspect contributes to the inherent meaning of intransitive patterns and highlight influences behind variation within the situation types of patterns. Finally, section 5.6 explores the inherent meaning of the pure intransitive, considering key influences in meaning variation such as animacy and other lexico-grammatical features.

Lastly, Chapter 6 brings together everything we have discussed and discovered in relation to pure intransitives. Section 6.1 considers the classification of intransitives in relation to each of the three studies and addresses each of the three sub-aims that have been met. The nature of the intransitive is explored in a final discussion in section 6.2 as a means of rounding off the research. Finally, limitations of the thesis are acknowledged in section 6.3 and avenues of future research are provided in section 6.4.

2. Pure intransitivity and verbal classifications

As introduced in Chapter 1, this PhD thesis concerns the classifications of intransitive verbs in terms of their semantic features and grammatical patterning. The motivation of the research is grounded within the indeterminate nature of verbal classification, and in a particular sub-type of intransitive verbs which are captured by the term Behaviours. As a reminder, Behaviours semantically represent psychological and physiological experiences of animate subjects, such as *dreaming, laughing* and *sneezing.* At this point, the definition of Behaviours is based on literature that classifies these verbs types / experiences and we are yet to establish empirical evidence for their grammatical criteria. However, as the literature currently indicates (which may or may not hold empirically), Behaviours are likely to be pure intransitives, favour the progressive form, and do not incorporate a secondary clause within the primary clause such as with a *that*-complement (see section 1.3). The purpose of this chapter is to establish the theoretical underpinnings of intransitivity as well as verbal categorisation, in order to situate Behaviours within the literature. Discrepancies or 'indeterminacies' that can arise in the classification process will come to light in certain areas, though Chapter 3 addresses these indeterminacies in detail. This literature review provides a foundation of intransitivity accounts for each of the three studies in this thesis (presented in Chapters 3-5).

The organisation of this chapter is as follows. Section 2.1 provides an overview of intransitivity, including a comparison of ergatives and pure intransitives (section 2.1.1), an exploration of intransitive verb categorisation (section 2.1.2), as well as a review of how intransitives are addressed in theories that place greater emphasis on syntax (section 2.1.3), namely in Construction Grammar (Fillmore 1988; Goldberg 1995; Goldberg 1999) and Pattern Grammar (Hunston and Francis 2000). Section 2.1.4 motivates the review of verbal classifications. We then turn to these different approaches of verbal classifications to gain an understanding of how intransitive verbs are treated, and each section situates Behaviours within these approaches. Section 2.2 presents Halliday's (1985; 1994) theory of Systemic Functional Linguistics (SFL); as shown in Chapter 1, SFL is a central account to this thesis as we explore the classification of Behaviours (behavioural processes in SFL terms), as well as other pure intransitive categories later on in this thesis (see Chapter 4). Section 2.3 outlines an alternative classification of verbal experiences, namely Levin's (1993) verb classes and alternations. Finally, section 2.4 describes the classification of verbs (and clausal elements) according to lexical aspect (Aktionsart).

2.1 Intransitivity within the transitivity system

As mentioned in Chapter 1, whilst transitive and ditransitive constructions are well defined and researched, pure intransitives, i.e. those that do not have a transitive alternate (Liu 2008, p.298; Davidse 2011, p.22), are considered less often. We can reach a relatively clear understanding of pure intransitive syntax from previous accounts, though pure intransitive semantics has rarely been addressed and there is not much consideration for this construction type, as will become evident in the following survey of the main contributions to current descriptions of intransitives.

The main defining feature of intransitive clauses is that they have only one core participant (or argument), the subject (Dixon and Aikhenvald 2000a, p.2; Dixon 2005, p.29). This subject, according to Smith (1978, fn 12 p.109), is animate in "most intransitive verbs in English", although Smith does not provide evidence such as frequencies for this claim (frequencies are however provided in Chapters 3 and 4). Given that these verbs have only one argument, intransitives do not have a direct object as has been well established in the literature (Sweet 1891, p.89; Dixon and Aikhenvald 2000a, pp.2–6; Kemmer 2003, p.277; Huddleston and Pullum 2005, p.78). The absence of a direct object means that they cannot be passivized (Whorf 1956, p.89), however, they do allow certain types of complements (Huddleston and Pullum 2005, p.78; Downing and Locke 2006, pp.85–86). Whilst some scholars include subject and direct object under the term complement (e.g., Huddleston and Pullum 2002, p.53; Wardhaugh 2003, p.124), complement is used here in the sense of a functional element in a post-verbal position (Downing and Locke 2006, p.35) that cannot be made passive (see below for contrasts with adjuncts), such as *We listened to them playing* (Levin 1993, p.187) or *We walked five miles* (ibid, p.266).

There are several complement types that occur in intransitive clauses. Predicative complements express a property of the subject, such as *Rosa felt happy*, which differs from direct objects. Not only can complements not appear as subjects in a passive version of the clause (Huddleston 1984, pp.184–187), but direct objects represent a different semantic role of the subject (Huddleston and Pullum 2002, p.53). Predicative complements are realised by adjectives and noun phrases, whereas direct objects are only realised by noun phrases. Intransitive clauses with predicative complements are sometimes labelled 'complex-intransitives' (Huddleston and

Pullum 2002, p.53; Huddleston and Pullum 2005, p.78). Another type of complement in intransitive clauses include noun phrases, such as *a mile* in *run a mile* and are labelled 'adverbial objectives' in traditional grammars (Gleason 1965, p.308). Finally, prepositional complements in intransitive clauses are headed by a prepositional phrase, such as *to the baby* in *we listened to the baby* (Levin 1993, p.187). Clearly then it is not the case that intransitive clauses simply end with the verb. These complement types are argument-like in the sense that they 'complete' the verb in some sense, i.e., the clause would be semantically and/or syntactically incomplete (depending on the clause instance) without them, as will be discussed below.

Optional post-verbal elements, adjuncts, also occur within intransitive clauses, usually in the form of a prepositional phrase though not always (Dryer 2007, p.250). Adjuncts are defined as "optional elements of a situation expressed by a clause" (Downing and Locke 2006, p.69) that provide additional information about circumstances of an action, event or situation, such as time, place etc. (Hunston and Francis 2000, p.152). The main difference between complements and adjuncts is that complements "have to be licensed by the particular head verb whereas adjuncts do not" (Huddleston and Pullum 2005, p.78), and therefore adjuncts are less dependent on the verb. For example, the frequency adjunct *every Sunday* can occur in a wide range of clauses with different verbs, whilst complements are often licensed by the verb, such as prepositional complements of *refer* (*to* complement) or *apply* (*for* complement) (see discussion below). However, there is a long-standing problem with identifying their differences (Somers 1984; Meyers et al. 1996; Dowty 2000) and circumstantial roles can become confused with inherent participant roles (Fawcett 2009, pp.212–222). Herbst (2007, p.15) states that the distinction between complements and adjuncts "takes the form of a gradient rather than that of two clearly distinct categories". The difficulty often stems from identifying whether the prepositions or particles that head the complement or adjunct are included in the verbal process or as part of an adjunctival element. If omission of the prepositional phrase results in an ungrammatical sentence or a significant change in the verb meaning, then it is an obligatory complement (Gonzálvez-García and Butler 2018, p.359). An example is shown in (12).

(12)   a) Perhaps the reason lies *in their keep-fit routine* (Gonzálvez-García and Butler 2018, p.358)
       b) *Perhaps the reason lies

Additionally, complements depend on and are determined by the main verb (see examples (13) and (14)) whereas adjuncts are not (Huddleston 1988, p.61; Gonzálvez-García and Butler 2018,

p.359). For example, the *to* prepositional phrase in example (13) is dependent on the verb *object* and replacing this verb (e.g., with *oppose*) would result in an ungrammatical clause. Instances like these are described as "word-specific" (Gonzálvez-García and Butler 2018, p.359). Example (14) shows a similar instance where the preposition *to* lexically belongs with the verb *refer* – "the entry in the lexicon for *refer* must specify that it takes a complement headed by *to*" (Huddleston 1988, p.61). Verbs such as those in (13) and (14) are labelled 'prepositional verbs'. Other examples of prepositional verbs include *apply (for), decide (on), attend (to)* etc. (Huddleston 1988, p.61).

(13)   They didn't object *to the murder and shooting* (Gonzálvez-García and Butler 2018, p.359)

(14)   Many people referred *to her article* (Huddleston 1988, p.61)

Adjuncts are not determined by the verb and can often be relocated to other parts of the sentence (see example 15b), or even omitted (see example 15c) (Quirk et al. 1985, pp.50–52).

(15)   a) I've built a neat 40f long palisade fence *in my garden* (Gonzálvez-García and Butler 2018, p.358)
b) *In my garden*, I've built a neat 40f long palisade fence
c) I've built a neat 40f long palisade fence

Whilst the grammar of pure intransitives is well-defined, their semantic description is less so. However, some scholars do outline semantic attributes of intransitives. Davidse (1999, p.108) suggests that pure intransitive clauses have just one energy source and later goes on to claim that pure intransitives represent "self, or internal, causation" (Davidse 2011, p.23). Similarly, Smith (1978a, p.107) claims that these intransitives "refer to independent activity that cannot be externally controlled", or as Levin and Rappaport Hovav (1995, p.91) put it, intransitives are "internally caused". In general, however, there is a dearth of literature concerning the meaning of pure intransitives, especially in comparison to other constructions; we saw in Chapter 1 that transitive and ditransitive constructions have a clear inherent meaning, and there also appears to be a substantial focus on the causative meaning of ergatives (see section 2.1.1 below). A potential reason for the lack in semantic description is their apparent infrequency in English (see section 5.1 for detail on this). We return to the pure intransitive meaning in Chapter 5.

So far, this section has considered the classification of pure intransitives. Although, to be clear about what this category includes, we need to consider what is excluded. Thus, the following

section addresses ergativity for a clear understanding of the different intransitive constructions and how pure intransitives differ from ergatives.

2.1.1   Ergativity

Whilst the basic distinction between pure intransitives and transitives involves the presence (or lack) of a direct object and potential for passivisation (see examples (16) and (17) respectively), ergativity relates to clauses that are not explained by transitive/intransitive contrasts alone (Keyser and Roeper 1984, p.381). In English, the ergative system is difficult to analyse because it is a language that "does not formally mark the ergativity/transitivity distinction" (Lemmens 1998, p.4).

> (16)   John talks (Keyser and Roeper 1984, p.381)
> (17)   John ate the apple (ibid)

Pure intransitive constructions are distinguished from ergative intransitive constructions (i.e., "inergatives"; Davidse and Geyskens 1998, p.158)[9] by their transitive alternations and syntactic relations of participants. Pure intransitives never alternate with a transitive cognate form whilst intransitive ergatives have a transitive alternate (O'Grady 1980, p.57; Davidse 2011). For example, *the ice* is the subject of the intransitive ergative in example (18) and the object in the transitive alternation in example (19) – compare this to example (16) where the pure intransitive does not have a transitive alternate. Verbs in pure intransitives are labelled 'unergatives', whilst verbs in ergative constructions are labelled 'unaccusative' (see section 2.1.2).

> (18)   The ice melted (Keyser and Roeper 1984, p.381)
> (19)   The sun melted the ice (Keyser and Roeper 1984, p.381)

Semantically, pure intransitives represent internal or self-causation (as we saw in section 2.1) whereas intransitive ergatives represent external causation (Davidse 2011, p.28). The external energy source is not always explicitly stated (Davidse 1999, p.108), such as the cause of the *melting* in example (18). Langacker (2008, p.356) defines this semantic distinction in terms of "archetypal roles", which include an agent and patient. The agent is the participant that carries out an action, whilst the patient undergoes the action or "change of state" (ibid). Pure

---

[9] Whilst intransitive ergatives are labelled "inergatives", this term shall be avoided so as to not cause confusion with 'unergatives' – a term used to refer to pure intransitive verbs (introduced in this section and section 2.1.2).

intransitives always have an agent as subject (e.g. *John* in example (16)), whereas ergatives can have an agent subject (*the sun* in the transitive example (19)) or patient subject (*the ice* in the intransitive example (18)).

These different participant roles represent differences in 'causativization', a process commonly viewed as adding the semantic notion of CAUSE to an intransitive base, deriving a transitive ergative (Keyser and Roeper 1984; Guerssel et al. 1985; Kitazume 1996, p.166). The causative process reflects the meaning "cause to *V*-intransitive" (Levin and Rappaport Hovav 1995, p.79). Ergatives allow a causative paraphrase (see example (20)), unlike transitives (see example (21)) (Davidse and Geyskens 1998, p.159).

(20)   The sun caused the ice to melt
(21)   *John caused the apple to eat

Within studies of ergativity, distinctions are made between ergatives and middle constructions. As this dissertation is concerned with pure intransitives, only a very brief definition is provided here (cf Keyser and Roeper 1984; Davidse and Heyvaert 2007; Davidse and Olivier 2008). Defining and identifying English middles can be complicated as opinions differ in the literature (Kitazume 1996, p.167; Davidse and Heyvaert 2007), however middles are typically defined as medio-.passive constructions where the clausal voice lies between active and passive (Davidse and Olivier 2008, p.170). As with intransitive ergative constructions, middles have an active verb form with a patientive subject and there is an implied (but not expressed) agent (Davidse and Heyvaert 2007, pp.38–50). However, middle constructions function to express properties of an object as opposed to events in time (Keyser and Roeper 1984, p.384; Fagan 1988, p.200). These properties include the ability for an action to be carried out and with what difficulty it is carried out (Davidse and Heyvaert 2007, p.38). Grammatically, middles typically occur with adverbials (*well* in example (22)) (Davidse and Heyvaert 2007, p.50).

(22)   More than 50 years later, the book still sells well (Davidse and Heyvaert 2007, p.38)

It is generally acknowledged that intransitive verbs do not occur in the English middle but they do in intransitive ergatives (Roeper and Siegel 1978, p.208; Keyser and Roeper 1984, p.392). However, previous research has been convincing in showing that certain English middles include an intransitive verb with a circumstance of location or instrument as subject (cf Davidse

and Heyvaert 2003; Heyvaert 2003; Davidse and Heyvaert 2007). For example, Davidse and Heyvert (2007 pp.45-46) show that certain circumstances of location in an intransitive middle clause (*but with the ground riding slower, he should improve dramatically*) cannot be construed as an object in an active clause (**the jockeys rode the ground slower*) or the subject in a passive clause (**the ground was ridden slower (by the jockeys)*). Though as stated above, these are not concerned with the pure intransitive construction and therefore we shall not explore middles any further. The following situation considers how the pure intransitives category Behaviours is situated in relation to ergativity.

2.1.1.1 *Ergativity and Behaviours*

Overall, Behaviours are typical of pure intransitive clauses as opposed to ergatives or middles, and so include unergative verbs as opposed to unaccusative verbs. Levin and Rappaport Hovav (1995, p.80) show that prototypical unergatives, and specifically Behavioural verbs such as *laughing* (see example (23)) or *speaking,* do not participate regularly in the causative (ergative) alternation in English. However, causation can be expressed in an alternative construction, such as example (23c).

> (23)   a) The crowd laughed (Levin and Rappaport Hovav 1995, p.80)
> b) *The comedian laughed the crowd (ibid)
> c) The comedian made the crowd laugh (ibid)

However, there are some rare instances in which Behavioural verbs appear to occur in ergative constructions. Levin and Rappaport Hovav (1995, p.116) show that whilst verbs of bodily processes (representative of Behaviours), such as *coughing*, do not typically show causative uses, the two verbs *burp* and *bleed* are exceptions. Examples are shown in (24) and (25) respectively.

> (24)   a) The baby burped (Smith 1978a, p.107)
> b) The nurse burped the baby (ibid)
> (25)   a) The patient bled (Levin and Rappaport Hovav 1995, p.116)
> b) The doctor bled the patient (ibid)

However, the verbal semantics of the examples in (24b) and (25b) is distinct from the verbal semantics of their pure intransitive counterparts in (24a) and (24b) and therefore they are not directly related ergative alternations. Levin and Rappaport Hovav (1995, pp.115-116) describe these instances as 'idiosyncratic pairs' that are "not representative of any sort of regular type of causativization". They highlight that the example in (25) can only be used in a "very

restricted way" (ibid, p.116), for example if someone bled from cutting their hand on a knife, then the causative use with *the doctor* would not be applicable. Thus, Behaviours do not have transitive alternations like ergatives do, which suggests that Behaviours belong within the category of pure intransitive constructions. Levin and Rappaport Hovav (1995, p.144) show that the reason these verb types are unable to undergo lexical causativization is because they are internally caused, and a causative counterpart would require an introduction of an external cause.

Thus, there are clear differences between pure intransitives and ergatives, and it is the pure intransitives that are most typical of Behaviours. We now take a closer look at intransitive verb classification and how it is dealt with in the literature, from semantic as well as syntactic perspectives.

2.1.2 Intransitive verb classification

Intransitivity has been approached in a variety of ways within the literature. Certain linguists focus on verbs and categorise them depending on their semantics (cf Perlmutter 1978; MacWhinney 1999; Levin and Hovav 2005; Dryer 2007) or their syntactic relations (cf O'Grady 1980; XTAG Research Group 2001). Research has also been devoted to intransitive verbs and their aspect and argument structure (Tenny 1987; Dowty 1991; Zaenen 1993; Levin and Rappaport Hovav 1995; Rappaport Hovav and Levin 2010; van Gelderen 2018), which is addressed in section 5.1.

There are a range of ways to categorise intransitive verbs semantically, and various frameworks use various semantic labels. One basic categorisation is by MacWhinney (1999, p.227), who outlines four categories of meaning that are conveyed by intransitive verbs: actions (*run, jump*), changes in state (*fall, redden*), constant states (*rest, stand*) and processes (*rain, relax*). MacWhinney (1999, p.227) describes intransitive verbs as a "rich set of embodied affordances", which allow us to not only imagine a distant object in a certain state, but to embody the state or change through imagination of human activity (see example (26)).

> (26)   The tree is standing (MacWhinney 1999, p.227)

MacWhinney explains that in example (26) it is possible to imagine the ongoing state of the tree standing still from the perception of standing still ourselves.

Another, widely referenced, approach to intransitive verb categorisation is the 'Unaccusative Hypothesis' (Perlmutter 1978), where intransitive verbs are labelled as 'unergative' and 'unaccusative' (Perlmutter 1978; Levin and Rappaport Hovav 1995; Ninio 1999; Dryer 2007; van Gelderen 2018; Vernice and Sorace 2018). As highlighted by Levin and Rappaport Hovav (1995), there are different ways in which these verbs are classified in the literature, such as syntactically or semantically, though the definition that follows here provides a general summary. Unaccusative verbs occur in intransitive ergative constructions (as outlined in section 2.1.1), whereas unergative verbs occur in pure intransitive constructions. Unergatives are regarded as compatible with adverbs like *deliberately* and have animate first participants, whereas unaccusatives are not compatible with these adverbs and can have both inanimate and animate participants (van Gelderen 2018, pp.28–29). Examples of unaccusative verbs include: those whose subjects are semantically 'patient', such as *burn, sink, boil, dry*; verbs of existence, such as *exist, happen, occur*; aspectual predicates, such as *start, continue, end*; duratives, such as *last, remain*; and verbs that impinge on senses, such as *shine, crackle* (Tenny 1987, p.261; Kuno and Takami 2004, p.10). Tenny (1987, p.261) also notes the additional categories 'inchoatives' (*melt, freeze, evaporate*), and 'verbs expressed by adjectives' which includes verbs "describing sizes, shapes, weights, colours, smells, state of mind etc". Unergative verbs include: verbs of involuntary bodily processes, such as *cough, yawn, snore*, (Tenny 1987, p.260; Levin and Rappaport Hovav 2005, p.13); verbs of volitional acts, such as *talk, smile, swim, fight* (Tenny 1987, p.260; Kuno and Takami 2004, p.10); manner of speaking verbs, such as *whisper, shout grumble*; and sounds made by animals, such as *bark, neigh, quack* (Tenny 1987, p.260).

However, the classification of unergative and unaccusative classes is not straightforwardly binary, as verbs can show variation in their behaviour (Levin and Rappaport Hovav 1995; Sorace 2000; Alexiadou et al. 2004). As Dąbrowska (2016a) points out, "Complex syntactic and semantic properties of verbs have resulted in the difficulty to distinguish clear-cut verb classes". To account for this variability of verb nature, a continuum of unaccusativity has been proposed (van Gelderen 2018, p.33), whereby 'change of location' (*fall, arrive*) and 'change of state' (*begin, rise*) verbs are at the unaccusative end and 'non-motional controlled process' (*work, talk*) and 'motional controlled process' (*walk, swim*) at the other end. The 'existence of state' category lies in the middle, which includes verbs such as *exist*, *please* and *belong*. Though, certain verb instances fit diagnostics of both unaccusative and unergative verbs, which

are accounted for as 'unaccusative mismatches' (cf Levin 1986; Zaenen 1993; Levin and Rappaport Hovav 1995; Dąbrowska 2016a). For example, change of location verbs are "unaccusative mismatches" as they have the same syntactic patterning as the typical unergative verbs, yet are telic and often caused by an external force. Despite the potential ambiguities in classification, the Unaccusative Hypothesis provides us with one perspective of intransitive verb classification.

An alternative perspective to classifying intransitive verbs by semantics is their syntactic behaviour. The XTAG research group (2001, pp.37–49) outlined five different intransitive verbs types, depending on the constructions they occur in. The first is the 'simple intransitive verb', which can take adjuncts. In total, 1878 verbs were found to occur as simple intransitives, such as *eat, sleep* and *dance* (note that these also include transitive verbs). These intransitives that have nothing following the verb but potential adjuncts are also labelled 'bare intransitives' (XTAG Research Group 2001, p.50), a term which shall be used in this thesis. Second, the 'intransitive verb particle' concerns intransitive verbs that combine with a verb particle. They are compositional, such as *add up, come out* and *sign off* (see example (27)). The XTAG research group found 159 verb/verb particle combinations.

(27)   The numbers never really *add up* (XTAG Research Group 2001, p.43)

The third type is the 'intransitive with prepositional phrase'*,* where the verb cannot occur as a bare intransitive without the prepositional phrase. Therefore, verbs that have the possibility to (but aren't required to) take a prepositional phrase are excluded from this category and occur in the simple intransitive category. Twenty-two verbs were identified in the intransitive with prepositional phrase group. An example is provided in (28).

(28)   Jones ventured *into the cave* (XTAG Research Group 2001, p.47)

The fourth intransitive verb category is labelled 'intransitive with adjective' and includes verbs constructions that have adjectives as complements. This category only includes verbs that must be followed by an adjective (see example (29)). A total of 34 verbs were identified.

(29)   The greenhouse became hotter (XTAG Research Group 2001, p.50)
         *The greenhouse became

The final category is the 'intransitive sentential subject', in which only one verb (*matter*) occurs with a sentential subject (see example (30)). Sentential subjects can be indicative, meaning a complementizer is required (see example (31)), or infinitive, where a complementizer is optional (ibid, p.61).

(30)   To arrive on time matters considerably (XTAG Research Group 2001, p.62)
(31)   That Joshi arrives on time matters to everyone (ibid)

This research from the XTAG research group has shown how intransitive verbs can be classified according to their syntactic behaviour. The following section continues the exploration of intransitive grammatical patterning by reviewing how two well-established Grammars, namely Construction Grammar and Pattern Grammar, address intransitivity.

2.1.3   Situating intransitives within Construction Grammar and Pattern Grammar

Whilst there are a variety of approaches to syntax and constructions, this section situates intransitives within two prominent grammars, specifically Construction Grammar and Pattern Grammar. These two grammars were included in this review because they provide the most detailed accounts on the syntactic nature of intransitivity amongst the current relevant literature. This section will firstly outline Construction Grammar, followed by Pattern Grammar.

Whilst there are various approaches to Construction Grammar (cf Hoffmann and Trousdale 2013b), this summary draws mainly on Goldberg's argument structure approach. Construction Grammar is "a theory of linguistic knowledge" (Hilpert 2014, p.2) and follows the notion that we form a network of language from a collection of constructions that is stored in our knowledge, which Goldberg (2003, p.219) labels a "construct-i-con". The construct-i-con "contains everything that would be contained in a lexicon" as well as "a large number of symbolic units that are larger in size than single words" (Hilpert 2014, p.2). However, the focus on the language network in the mind means that constructional approaches fall short in accounting for the socio-functional use of language (Lucy 1996; Croft 2001, pp.364–365), such as a lack of consideration for why certain constructions are used and the interpersonal function of language. Nonetheless, interactions of different frameworks can help to bridge the gaps

between contrasting perspectives, as Fischer (2015) argues with Construction Grammar and Conversation Analysis (cf Fischer (2015) for a detailed account).

Goldberg (1995, p.6) defines a construction as a "form-meaning correspondence" where a linguistic form pairs with a meaning. In this definition, morphemes and words are constructions in themselves, as are larger units of language such as phrasal patterns and idiomatic expressions (Goldberg 2003, p.219). To be determined as a construction, one or more features must not be "predictable from knowledge of other constructions" (Goldberg 1995, p.4). In other words, the meaning and form of a construction should not be derived from another construction. Construction Grammar disregards the idea that the main verb determines the form and interpretation of sentence patterns (Goldberg 2003, p.220). A frequent example used to explain this is with *sneeze* in a three-argument sense or construction, as in (32).

(32)   He sneezed the napkin off the table (Goldberg 1995, p.9)

Although *sneeze* is a "parade example of an intransitive verb" that does not intuitively require a direct object complement (Goldberg 1995, p.9), it can be used in this three-argument sense in the caused-motion construction (this construction is defined below). Thus, certain phrasal constructions exist independently of particular verbs and different complement configurations produce different meanings.

Construction Grammar's disregard for the role of the main verb in determining clausal patterns is advantageous as it helps to avoid circularity (Goldberg 1995, pp.10–11). Circularity is defined as using "the conclusion itself (or a closely related proposition) as a crucial piece of support" (Rips 2002, p.767) for the phenomenon being discussed or defined. In other approaches where lexis is given more prominence, such as Levin's (1993) classifications (see section 2.3), the verb is assumed to determine its complements in the clause. Goldberg (1995, p.11) suggests that circularity arises in these approaches because a verb is claimed to have "an *n*-argument sense" on the basis that it occurs with *n* participants (*n* meaning unspecified number), yet it can also be argued that a verb occurs with *n* participants because it is an *n*-argument sense. For example, a verb such as *kick* is considered as transitive when it has two participants (e.g., *Paul kicked the wall*) but then also ditransitive with three participants (e.g., *Pat kicked Bob the football*). Goldberg (1995, p.12) considers this as "positing a new sense every time a new syntactic configuration is encountered and then using that sense to explain the existence of the syntactic configuration". By considering the form-meaning correspondence

as one construction, Construction Grammar avoids circularity. Although, Goldberg's (1995, p.12) view that this supposed circularity is an "issue of the interaction between verb meaning and constructional meaning" could be said to undermine the importance of the lexico-grammar and how lexis and grammar interact to form meaning (see section 2.2 for Halliday's interpretation of lexico-grammar). For example, from an alternative perspective, Hanks (2013) argues the case of verb meaning potential, which accounts for variation in verb senses. According to his approach, a lexeme in isolation has meaning potential and the verb in its grammatical patterning has meaning (see section 3.2.2.1), which places an important emphasis on both the lexical item in isolation, as well as in context and use. As Boas (2013, p.238) highlights, "the status of lexical entries is problematic" in Goldberg's approach to Construction Grammar. For example, although a verb is considered a construction in its own right, this generally results in a lack of semantic description. Moreover, van Trijp (2015, p.623) argues that whilst Goldberg (1995, p.50) proposes the fusion of verbal constructions with particular argument structure constructions, she "has never offered any specific details of how this process of *fusion* might work" (cf van Trijp 2015 for further discussion).

The literature on intransitive constructions in Construction Grammar appears to be relatively scarce compared to two or three-argument constructions, which are frequently detailed. For example, in Goldberg's (1995) seminal book "Constructions: A Construction Grammar Approach to Argument Structure", the English 'ditransitive', 'caused-motion', 'resultative' and 'way' construction each bear their own detailed section. Hilpert (2014, p.xi) even highlights that readers come across construction grammar "perhaps in connection with a sentence such as *John sneezed the napkin off the table*", which is an instantiation of the well-documented caused-motion construction. Whilst there is less attention on intransitive constructions, Goldberg (1999, p.198) outlines five constructions that intransitive verbs typically fit into and provides examples for each with the intransitive verb *sneeze*. The first construction is labelled simply the 'intransitive' construction, which consists of a subject and verb predicate, with potential adjuncts (see example (33)).

(33)   She typed for three hours (Goldberg 1999, p.198)

This construction is perhaps the most obvious construction concerned with intransitivity and has already been described in the general overview of intransitivity – as shown in section 2.1, this construction is regarded a 'pure intransitive' construction and is of most relevance to this thesis. However, this intransitive construction is rarely explained or expanded on in the

construction grammar literature, and the remaining four intransitive constructions (outlined below) appear to be given much more attention. Croft (2007, pp.473–478) does also refer to the intransitive construction, although again there is no reference to its broad meaning, but only its structure.

The second construction that Goldberg (1999, p.198) refers to is the 'caused-motion' construction. In these constructions, the first argument – the causer – causes the second argument to move in a directional path (Goldberg 1995, p.152). The caused-motion construction is represented as *X causes Y to move Z*, such as the example shown above *John sneezed the napkin off the table*. Whilst intransitive verbs fit into this construction, the construction itself is not intransitive. Occasionally the intransitive-motion construction is addressed in relation to the caused-motion construction (Goldberg 1995; Perek 2015, pp.81–82), though this is still specific to motion events and does not account for other intransitives such as bodily functions or communicative events (see example (34)).

(34)   The bottle floated into the cave (Talmy 1985, p.69)

The intransitive-motion construction differs from the caused-motion, whereby the causer is not expressed, and the object moves into subject position. This construction takes the meaning *X go Y* as opposed to *X cause [Y go Z]*, where *the bottle* in (34) represents *X* and the prepositional phrase *into the cave* represents *Y*.

The third construction that intransitive verbs occur within is labelled the 'resultative' construction, whereby the first argument causes the second argument to become a certain state, as in *X cause Y to become Z* (Goldberg 1995, p.79). Again, this is not an intransitive construction, but does have an intransitive counterpart – the 'intransitive-resultative' construction. The intransitive-resultative encodes a change of state in *X become Y* (Perek 2015, p.82). Examples of the intransitive-resultative and the resultative constructions are shown in (35) and (36) respectively.

(35)   The pond froze solid (Perek 2015, p.82)
(36)   John watered the tulip flat (ibid)

The fourth construction outlined by Goldberg is the 'cognate object' construction (see example (37)). These constructions frequently occur with an intransitive verb and a noun phrase that

derives from the verb (Sailer 2010, p.192). Cognate objects are not direct objects and therefore the clause cannot be passivized, such as *a sad laugh* in example (37).

(37)   Mary laughed a sad laugh at the meeting (Kuno and Takami 2004, p.105)

Finally, intransitive verbs occur in the 'way' construction (see example (38)). This construction concerns an entity carrying out an action or motion in a certain path, denoted by the noun *way* (Goldberg 1995, p.203). It is argued that the 'way'[10] construction represents a kind of idiom (Jackendoff 1990, p.221).

(38)   She sneezed her way to the emergency room (Goldberg 1999, p.198)

There are four main intransitive constructions outlined above – 'intransitive', 'cognate-object', 'intransitive-motion', and 'intransitive-resultative' – but interestingly only the first two were explicitly stated as involving intransitive verbs by Goldberg (1999, p.198). An additional intransitive construction is the 'conative' construction (see example (39)), which denotes the "intended result of the act" in *X direct action at Y* (Goldberg 1995, p.63). In this construction, the prepositional complement headed by *at* always follows the verb (Levin 1993, p.42). The example in (39) displays the intransitive conative construction with the transitive verb *shot*.

(39)   Ethal shot at Fred (Goldberg 1995, p.63)

However, the examples listed above appear to be invented as a means to support the theoretical description of constructions. As Hanks (2013, sec.381) highlights, there is a tendency in Construction Grammar to rely on "invented evidence" which is not truly representative of language use and the frequencies of the constructions being discussed. Nonetheless, as Fischer (2015, p.575) highlights, "much of current work in [Construction Grammar] is based on corpus-linguistic studies" (cf e.g., Hilpert 2013; Kay 2013 for examples of Construction Grammar using corpus linguistics).

Additionally, only a small range of constructions are typically addressed in Construction Grammar. There is a tendency to focus on unusual constructions and scholars "have

---

[10] The 'way' construction will always be presented with single quotation marks because of the general use of *way* that is harder to distinguish as the label of a construction.

comparatively dealt less with common, mundane, and more predictable constructions, and it remains to be seen to what extent these constructions can equally be described in terms of form-meaning pairs." (Perek 2021). We have seen evidence for the limited number of constructions above; whilst there has been some evidence for intransitive constructions in Construction Grammar literature, their descriptions are less detailed than the constructions with two or more arguments, and it is hard to come across much description of pure intransitive constructions. It is worth adding that the different intransitive constructions outlined above have highlighted the clarity in using the label 'pure intransitive' than simply 'intransitive' as Goldberg (1999, p.198) does.

We now turn to the second syntactic approach addressed in this section – Pattern Grammar (Hunston and Francis 2000). Pattern grammar is similar to construction grammar in describing language use, though Pattern Grammar was developed "in the traditions of corpus linguistics" as opposed to cognitive linguistics (Hunston and Su 2019, p.569). A pattern is defined as "all the words and structures which are regularly associated with the word and which contribute to its meaning" (Hunston and Francis 2000, p.37). Patterns are identified by a relatively frequent combination of words and a clear meaning association and are outlined according to different word groups including nouns, verbs and adjectives. Specific to verbs, verb patterns are indicated by a capitalised 'V' in the pattern. For example, *V for n* represents a verb followed by a prepositional phrase with noun group, headed by the preposition *for* (Hunston and Francis 2000, p.34). Constructions and patterns often overlap in that they can be the same thing, for example the 'way' construction (as in example (38)) is also sometimes regarded as a pattern (Francis et al. 1996, pp.330–358; Hunston and Francis 2000, pp.54, 100). It is recognised as both a construction and pattern because it has a meaning and form pairing, and it is an observable construct in corpus data. Despite many overlaps, there are differences in patterns and constructions. Pattern Grammar focuses on the observability of constructs using corpus data (Hunston and Francis 2000, p.1), whilst constructions are regarded as more mental constructs (hence construct-i-con). Constructions account for all language entities, encompassing words, units of meaning and larger patterns, but patterns do not. As the focus of patterns is on corpus data, they provide useful evidence for certain constructions.

Whilst Pattern Grammar is unlikely to help identify an intransitive meaning, as it does not focus on the meaning of the generalized pattern, it is still interesting to see how intransitives are addressed in this approach. Intransitives appear to be accounted for slightly more in Pattern

Grammar compared to Construction Grammar, as they are more thoroughly documented. Though Pattern Grammar was not an established grammar at the time of Hornby's language research, he (and colleagues) provided preliminary insights into the highly patterned use of language, revealing that words, including verbs, are "typically associated with only a small number of syntactic patterns" (Hanks 2008, p.90). Hornby's (1954) early work of language learner guidance links verb (and noun and adjectival) patterns to meanings. In a revised version, Hornby (1975, pp.12–13) outlines 25 verb patterns, five of which were intransitive, such as *S + vi* and *S + vi + preposition + noun/pronoun* (*vi* indicating an intransitive verb). The 'Collins COBUILD Grammar Patterns 1: Verbs' (referred to hereafter as 'the COBUILD') (Francis et al. 1996) presents a more comprehensive compilation of verb patterns, in which around 40 intransitive patterns are outlined (such as *V about n*, *V to n*, *V in n* etc.) alongside their verb meaning groups. Whereas Hornby (1975, p.13) combines all prepositions into one pattern, the COBUILD goes into a finer level of delicacy and separates patterns by prepositions. Thus, whilst we are able to obtain verb meanings that occur within specific patterns, as well as the syntactic nature of intransitives, there is no evidence for a specific patterning meaning.

Pattern Grammar has a pedagogical objective and has been fundamental in developing learner compilations of language patterns, such as the COBUILD outlined above, however one area in which it falls short is in finer descriptions in the lexico-grammar (Teubert 2007). For example, though in reference to nominal complements, Teubert (2007, pp.75–77) points out that Francis, Hunston and Manning (1998) fail to clearly distinguish between complement and adjunct classes in certain nominal patterns, which can therefore lead to an inappropriate reading. We can also find this in their verb patterns (Francis et al. 1996), where objects, complements and adjuncts are all listed under the same pattern. Nonetheless, scholars do highlight the success of Pattern Grammar in beginning to bridge the gap between grammar and lexis (Halliday 2002a; Teubert 2007). Upon this review of the syntactic consideration of intransitivity, we now turn to motivations for an alternative perspective, which includes further consideration for the lexico-grammar.

2.1.4   Motivating the review of verbal classifications

So far, section 2.1 has provided the main descriptions of intransitivity, exploring the nature of intransitive verbs as well as intransitive constructions. The purpose of the following sections is to provide an insight into how different frameworks address the use of language in conveying

experiences and events, and where intransitives, particularly the intransitive category of Behaviours, fit into these. In doing so, the remainder of this chapter will provide insights from a variety of frameworks. These approaches all incorporate semantic perspectives and consider the interplay of the verb and its grammatical environment to some extent. Verbal or experiential categorisation is important for our understanding of how language works and how we portray our experiences.

Section 2.2 outlines Halliday's (1994) representation of experiences within Systemic Functional Linguistics (SFL). SFL is the logical starting point in describing experiential classification, as it has its own category dedicated to Behaviours (the behavioural process). Section 2.3 then addresses verbal classification from a more semantic perspective (though alternations are taken into consideration), focussing on Levin's (1993) classification of verb classes and alternations. Her work was chosen owing to its prominence in verbal taxonomy, taking a different approach to the lexico-grammatical system in SFL. Finally, section 2.4 presents the classification of verbs from the semantic perspective of lexical aspect (aktionsart). As will be motivated below, lexical aspect has the potential to contribute to our understanding of the semantic description of Behaviours.

2.2 Representing experiences in Systemic Functional Linguistics (SFL)

Systemic Functional Linguistics (SFL) is a semantic theory developed by Halliday (1994) that concerns how language conveys meaning. The theory states that language is a system network with different meaning potentials, in which speakers or writers choose specific lexico-grammatical features in order to express their desired meaning (Halliday and Matthiessen 2014, p.217). Halliday outlines three equally important meanings, also referred to as metafunctions, that are identified in each clause: ideational, interpersonal and textual. The ideational metafunction has two sub-categories, experiential and logical, and it is the experiential sub-category that is relevant here. The experiential metafunction concerns the representations of experiences and actions through transitivity choices. It reveals "who does what to whom" (Teo 2000, p.25) through differentiating processes. SFL provides a promising account of experiential classification, though indeterminacies (i.e. borderline cases or discrepancies in analysis) do occur and this is recognised within the theory (Halliday and Matthiessen 1999). While there is no claim that all verbal constructions fall neatly into one category or another, category indeterminacies and ambiguities pose problems for the theory and the researcher

(Gwilliams and Fontaine, 2015). Development of clearer criteria of process type classification would contribute to fewer ambiguities in SFL classification when put into practice – we return to this argument in Chapter 3. Section 2.2.1 now outlines the current criteria of process type classification in SFL literature.

2.2.1   Process type Classification in SFL

There are six processes in this stem of analysis – material, mental, relational, verbal, behavioural and existential (see Figure 2-1) – which are identified by the verbal group. Each process has its own set of participants that includes one obligatory participant, as well as up to two non-obligatory ones, both realised by nominal groups. Optional circumstances can also be included and are usually realised by either an adverbial group or prepositional phrase. When determining a process type, the analyst should be aware not to categorise the verbs alone; each process type has its own distinct grammatical and semantic criteria and Halliday argues that each process type should be distinguishable by their lexico-grammatical features. Lexico-grammar concerns the continuum between lexis and grammar (Halliday 1992, p.63). Halliday (1992, p.64) states that "if you interrogate the system grammatically you will get grammar-like answers and if you interrogate it lexically you get lexis-like answers", indicating that both perspectives should be taken into account. In SFL, lexico-grammatical features of process types are regarded as 'reactances', a term used by Whorf (1956, p.88) to describe "the distinctive treatment…of the category".
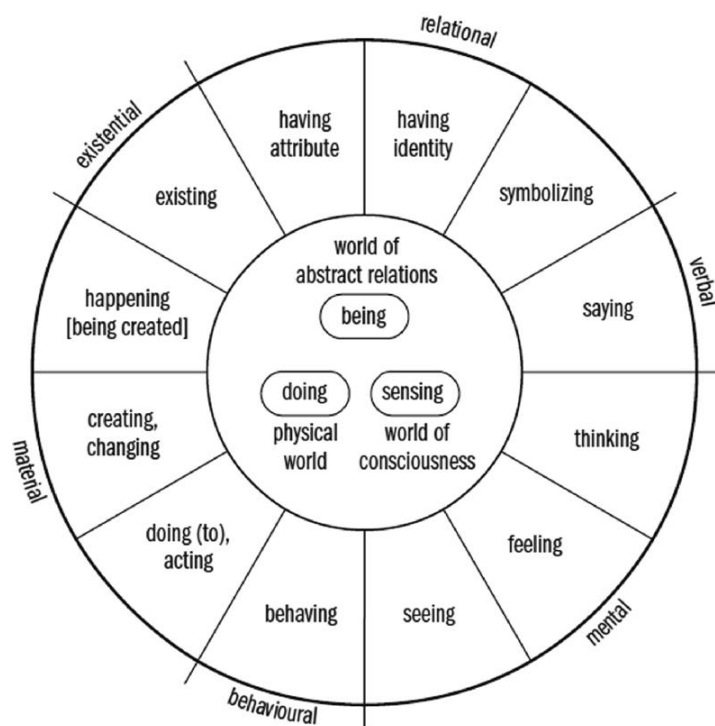
Figure 2-1: Halliday's (1994, p.108) diagrammatic summary of process types

Material processes represent physical actions and are regarded as the external doings and happenings of the world (Halliday 1994, p.108). They construe a "change in the flow of events" (Halliday and Matthiessen 2014, p.224), which occurs from an energy source. Material processes have up to three participants and are used intransitively or transitively. The 'Actor' carries out the process and is typically the energy source that causes a change in event. This participant can be represented by a human entity or something more abstract, such as *the storm* in Figure 2-2. The 'Goal' is the participant affected by the process and the 'Beneficiary' is the receiver of the action. This Beneficiary is either the 'Recipient' – when the Beneficiary has been given goods – or the 'Client' – when a service has been done for the Beneficiary (Halliday 1994, p.145). When the second participant is not directly affected but represents "the domain over which the process takes place" (Halliday and Matthiessen 2004, p.192), it is the 'Scope'[11] (rather than Goal). An example is shown in Figure 2-2, where *tennis* functions as Scope as opposed to Goal in *John and Mary were playing tennis* because *tennis* is not impacted upon by the process of *playing*. The favoured unmarked tense for material processes is the present-in-present (in SFL terms), namely the present continuous or present progressive aspect; in reference to the *now*, the progressive form is used with an *–ing* suffix. A final feature of

---

[11] The 'Scope' participant is considered the range of a Material process, introduced in the third edition of 'An Introduction to function Grammar' (Halliday and Matthiessen 2004).

material processes is that they do not 'project'. A projection occurs when a primary clause incorporates a secondary clause using either a quote or the conjunction 'that' (Halliday 1994, p.219). Examples of projections are shown in Figure 2-3 and Figure 2-5 in relation to mental and verbal processes respectively. Below, Figure 2-2 displays examples of clauses with material processes.

Actor	Material process	Goal	Recipient	Scope
They're	building	a house		
She	sent	her best wishes	to John	
John and Mary	were playing			tennis
The mayor	resigned			

Figure 2-2: Examples of Clauses with a Material process from Halliday (1994)

However, as we saw in Chapter 1, there is little to distinguish the intransitive material processes from the Behavioural processes (outlined below); the same lexico-grammatical features are outlined for each process and we are often required to judge solely on the semantics. We return to this argument in Chapter 4.

As well as outer experiences, humans experience inner consciousness. These are represented through mental processes, of which there are three semantic types (Halliday and Matthiessen 2014, p.246): mental processes of emotion, such as *love* or *hate*; mental processes of cognition, such as *know* or *remember*; and finally mental processes of perception, such as *feel* or *hear*. In terms of the grammar, mental processes are associated with two participants and are typically used transitively (though it is possible that the second participant is not explicitly present in the clause). The 'Senser', who must have consciousness, experiences the process. The second participant is the 'Phenomenon' which represents the experience that is being sensed. The set of things that can take on the Phenomenon role is broader than the Goal in a material process; whereas the Goal is always a thing, the Phenomenon can be a thing, act or fact (ibid, p.251). A distinguishing feature of mental processes is their occurrence with projections, typically a *that-*complement (see Figure 2-3).

Senser	Mental process	Phenomenon
She	likes	the gift
Jane	saw	that the stars had come out

Figure 2-3: Examples of Clauses with a Mental process from Halliday (1994)

Another feature that differentiates mental processes from material is that the favoured unmarked tense is the simple present tense. For example, as shown in Figure 2-3, this is represented by the grammatically unmarked clause *She likes the gift* as opposed to the marked *She is liking the gift.* Marked forms require a "special interpretation" such as inception (ibid, p.245), as in *She is liking the gift more and more every day.*

As well as reporting on actions and describing inner thoughts, humans learn to relate separate entities or experiences to each other – this is done through relational processes (Halliday 1994, p.119). Relational processes are typically realised by the verb *be* and are always transitive with two participants. There are two varieties of relational processes. The first is 'attributive', where the 'Attribute' participant represents a characteristic of the 'Carrier' participant. The second is 'identifying', where the 'Identifier' participant is specifically related to (or more literally, identifying) the 'Identified' participant. This explanation has followed the more simplistic labelling of identifying processes according to Fontaine (2013, pp.76–77) and Bloor and Bloor (2004, pp.120–122) – for a more detailed account, with an explanation of the alternative labels 'Token' and 'Value', see Halliday (1994, pp.124–129). Figure 2-4 demonstrates the differences between the two types of relational clause.

Sarah	is	wise
Carrier	**Relational process**	**Attribute**

I	play	the villain
Identified	**Relational process**	**Identifier**

Figure 2-4: Examples of clauses with a Relational process from Halliday (1994)

Whilst material processes represent outer experiences, and mental processes represent inner, relational processes can represent both (see examples (40) and (41)). The relational process in example (40) represents an internal feeling and in example (41) represents an external experience.

(40)   *She* is afraid (Halliday and Matthiessen 2014, p.260)
(41)   She has *a mahogany table* (ibid)

In between the three main processes (material, mental and relational) lie three minor processes; verbal, existential and behavioural. Verbal processes are situated between mental and relational

processes, and represent speech or saying, which "covers any kind of symbolic exchange of meaning" (Halliday 1994, p.140). In other words, to be classed as a verbal process a transfer of information is represented (Bartlett 2014, p.66). Verbal processes are regarded as borderline between mental and relational processes because they project "symbolic relationships" from consciousness as speech e.g., verbal clauses often represent conversations that include quotatives (Halliday and Matthiessen 2014, p.303). As in the case of mental processes, verbal processes can project, and typically occur in the simple present in the unmarked tense. Note that a projection does not have to be present in the clause, but rather should have to ability to project to be identified as a verbal process (Fontaine 2013, p.89). Another grammatical feature is that they have up to four participant functions. The 'Sayer' is an obligatory participant that expresses the message and can be a human or abstract entity. This participant is generally animate, although it can also be a "symbolic source" (Martin et al. 1997, p.109), as shown in example (42).

(42)   I have received a notice. *It* says, we have made a decision in this case […]
        (Bartley 2017, p.56)

In example (42), the Sayer *it* is a substitution for the inanimate participant *a notice* (identified from the previous clause). This participant is an instance of metonymy for an animate participant. Metonymy occurs when "one entity is used to refer to another entity that is associated with it in some way" (Hurford et al. 2007, p.339). Whilst *the notice* or *it* is inanimate, it is representing an animate entity – *we* in example (42). A projection is also evident in this example, shown by the reported clause *we have made a decision in this case […]*.

The 'Receiver' is another participant that occurs in verbal processes, which has the speech directed at them and is typically "a conscious being, a collective or an institution" (Halliday and Matthiessen 2014, p.303). Another participant is the 'Verbiage', representing what is said. Finally, the 'Target' represents the targeted entity in what has been said (see example (43)).

(43)   He also accused *Krishan Kant* of conspiring with Bansi Lal […] (Halliday and
        Matthiessen 2014, p.307)

In example (43), the Sayer *he* is targeting the person *Krishan Kant* (who therefore represents the Target) with an accusation. Figure 2-5 displays examples clauses with Verbal processes.

John	said		"I'm hungry"
The guidebook	tells	you	where everything is
Sayer	**Verbal process**	**Receiver**	**Verbiage**

Figure 2-5: Examples of clauses with a Verbal process from Halliday (1994)

Existential processes express existence and semantically fall between material and relational processes (Halliday 1994, p.107). They have one participant, the Existent, which represents the existing entity. Existential clauses are frequently recognised by the subject *there* (which does not represent a participant role), and the verb *be* as the process. Identifying these two characteristics forms the probe for Existential processes (Fontaine 2013, p.90). These process types occur transitively and cannot project or be used as quotatives. Figure 2-6 displays examples of Existential clauses.

There	's	someone waiting at the door
There	was	a hurricane
	Existential process	**Existent**

Figure 2-6: Examples of clauses with an Existential process from Halliday (1994)

Finally, Behavioural processes are situated in between mental and material processes and represent "physiological and psychological behaviour" (Halliday 1994, p.139). Figure 2-7 displays examples of Behavioural clauses.

The child	wept	copious tears
No-one's	listening	
Behaver	**Behavioural process**	**Behaviour**

Figure 2-7: Examples of clauses with a Behavioural process from Halliday (1994)

Behavioural processes are typically the most challenging process type when it comes to classification, because their lexico-grammatical features are not as clear cut as the other process types – this phenomenon is addressed in more detail in section 3.1.1. They "construe an external ('material') perspective on processes of consciousness" (Davidse 2017, p.81), such as *listening* compared to *hearing.* Downing and Locke (2006, p.152) state that behavioural processes tend to be involuntary, such as *breathing,* though they are also considered the volitional counterpart of involuntary perceptive mental processes, such as *listening* compared to *hearing* (Eggins 2004, p.250; Thompson 2004, p.103; Banks 2015, p.24) – consideration of this contradiction and its problems in process type classification are outlined in section 3.1.

Grammatically, behavioural processes typically have only one participant, the 'Behaver', which carries out the process. One major classification of the behavioural process is subject animacy; Behavers are regarded as having consciousness (Martin et al. 1997; Halliday and Matthiessen 1999; Eggins 2004; Halliday and Matthiessen 2014). In some cases, a 'Behaviour' is included in the process, which is typically a complement that acts like a second participant (Thompson 2014, p.109). The sole role of the Behaviour is to add detail to the represented process, such as *she gave a faint sigh* (ibid). This role is similar to a cognate object, where the head noun is a nominalisation of the verb and addition of a modifier can add more meaning (Levin 1993, pp.95–96; Huddleston and Pullum 2005, p.305) – see sections 2.1.3 and 2.3 for more detail on cognate objects. As a result, behavioural processes are almost always intransitive (Halliday 1994, p.139). Additional information of the process is also often introduced in circumstances, typically by prepositional phrases. Circumstances of matter and manner are most typical (Eggins 2004, p.234; Halliday and Matthiessen 2014, p.301), as shown in examples (44) and (45) respectively.

(44)   I was thinking about my holidays (Bartlett 2014, p.71)
(45)   He coughed loudly (Eggins 2004, p.234)

As with material processes, in the unmarked tense the behavioural process typically occurs in the present continuous / progressive form with an –*ing* suffix (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Bartlett 2014, p.72). However, there is also an unmarked case of the simple present in behavioural processes, which can often "sound dated or formal" (Bartlett 2014, p.72) – see example (46).

(46)   Why do you laugh? (Halliday 1994, p.139)

Several verbs that semantically denote communication occur in behavioural processes. One use of the behavioural process is to introduce direct speech within fictional narratives (Halliday 1994, p.139). In this sense, a behaviour is attributed to a process of saying (see example (47)).

(47)   "Kiss me!" she breathed (Halliday 1994, p.139)

Whilst O'Donnell et al. (2009, pp.3–4) have shown discrepancies in the coding of behavioural and verbal processes (see Chapter 3), one defining grammatical feature of the behavioural process is that they do not project (Martin and Matthiessen 1992, p.363). This can be seen in example (48).

(48) a) Marsha said that Bell was nice – Verbal process
      b) Marsha talked – Behavioural process
      c) *Marsha talked that Bell was nice

Example (48a) represents a verbal process with the projected complement clause *that Bell was nice*. Example (48b) displays a typical behavioural process with the semantics of communicating, whilst (48c) shows its unfamiliarity (or inability) with projections. There are some rare cases where a behavioural process can project, however this is only in highly restricted ways (Halliday and Matthiessen 1999, p.136), as shown in example (49). Martin et al. (1997, p.126) state that these behavioural quotatives occur in written narratives, as as Bartley (2017, p.61) points out, they are used metaphorically. Example (49a) displays a quotative, where the conscious state of frowning within a behavioural process is used to report communication (Bartlett 2014, p.71). However, this is only one directional as evidenced in example (49b).

(49) a) "I feel a little queasy" she frowned (Bartlett 2014, p.71)
      b) *She frowned "I feel a little queasy"

However, one problematic aspect of the behavioural process is that there is no robust test for its identification, unlike the other processes (cf Fontaine (2013, pp.96-107) for guidelines to identifying process types). Behavioural processes usually take the continuous form with the adverbial *right now,* though there are exceptions to this rule. For example, it would not make sense with the process of *breathing,* as in *she is breathing right now* (Bartlett 2014, p.72). Additionally, a potential behavioural process could be probed with '*what did X do?*', although this is also an identifier of material processes and therefore we run into the same difficulty of not being able to clearly distinguish these two processes. This probe can also be awkward or incompatible with certain behavioural verbs, such as *what he did next was breathe* (Bartlett 2014, p.72), and therefore it does not go far in solving ambiguities with the behavioural process. Other recommendations are to identify attributes such as if the participant involved in an activity or if there is a mental or verbal quality (Fontaine 2013, p.90), though again these are not clear distinguishing factors (we return to these ambiguities in Chapter 3).

Part of the problem in process type identification, and not just with the behavioural process, stems from the use of prototypical examples when describing SFL theory (Tucker 2014, p.402). Process type literature has been criticised for focussing on prototypical cases and so when it

comes to analysing more ambiguous examples, the analyst has less support which contributes to discrepancies. Additionally, these examples lack evidenced-based support with real language data, which is also true for SFL theory more generally. As Hanks (2013, p.307) states, linguists often invent "bizarre examples" which are then considered acceptable based on the researcher's intuition. The inclusion of bizarre examples is highlighted by Banks (2015, p.24) who regards a specific example by Bloor and Bloor as "extremely odd" (see section 4.2.1). Implementing real language data from corpora could allow for a more comprehensive understanding of process type classification and shed a better light on how we construe experiences. We return to this issue in Chapters 3 and 4.

As stated above, circumstances also contribute to the experiential meaning in a clause, which are briefly outlined here. Circumstantial elements "describe the process or situation in some way" (Fontaine 2013, p.79), such as where, when or how something occurred. Whilst the process and participant roles contribute specific lexico-grammatical features of each process type, circumstances "occur freely in all types of process" (Halliday 1994, p.150). Despite this, there are still circumstances that are typical of certain process types and less common with others. For example, behavioural processes are typical of circumstances of manner or matter (as shown above), whereas a manner circumstance in an attributive clause would be "fairly unusual" (ibid). Table 2-1, adapted from (Halliday and Matthiessen 2014, pp.313–314), summarises the different types of circumstances along with the interrogative forms (what Halliday and Matthiessen label "wh-item").

Table 2-1: Circumstance classification adapted from Halliday and Matthiessen (2014, p.313-314)

Type		Wh- item
Extent	Distance	How far?
	Duration	How long?
	Frequency	How many times?
Location	Place	Where?
	Time	When?
Manner	Means	How?
	Quality	How?
	Comparison	How? What like?
	Degree	How much?
Cause	Reason	Why?
	Purpose	Why? What for?
	Behalf	Who for?

Type		Wh- item
Contigency	Condition	Why?
	Default	
	Concession	
Accompaniment	Comitative	Who/what with?
	Additive	And who/what else?
Role	Guise	What as?
	Product	What into?
Matter		What about?
Angle	Source	
	Viewpoint	

However, different approaches to experiential analysis consider the role of certain circumstances differently (Butler 2003, p.396). For example, Fawcett (1987, p.139) introduces 'circumstantial relational processes' in his approach to SFL, where circumstances of location are analysed as participants in a relational clause (see example (50)).

(50)   Ivy went to Peru (Bartley 2017, p.115)

The prepositional phrase *to Peru* in example (50) would be analysed as a 'participant role: location' according to Fawcett, but a circumstance of location according to Halliday. As Bartley (2017, p.116) points out, this prepositional phrase is best analysed as a circumstance of location because the main verb *went* carries enough information and the prepositional phrase is "by no means needed for the clause to make sense".

Whilst this process type classification has provided a thorough description in accounting for how language is used to represent experiences, it lacks consideration for language at a cognitive level, with its main focus on social semiotics (Butler 2013; Fontaine 2017, p.116). Halliday and Matthiessen (1999) themselves acknowledge that SFL considers "language as a semiotic system … rather than a system of the human mind." In particular, this system of transitivity falls short of accounting for what these categories might be able to tell us about the language processes involved and whether these categories have any cognitive validity. Nonetheless, whilst SFL has been criticized for failing to address how the individual experiences language, cognitivism has been criticized for failing "to conceptualize practices in a way that recognises their action orientation and co-construction" (Potter 2000, p.31). A worthwhile solution could be to use aspects from different theories that can complement each other. That is not to say

theories and models should be all-encompassing as this would extend into something unmanageable, and as Butler (2013, p.192) points out (in regard to visual processing), each discipline deserves to be "studied in its own right". There is room for disciplines within linguistics to complement each other, especially with SFL and cognitive processes. As Fontaine (2017, p.116) points out, "SFL may have something to gain by considering the advances made within [Cognitive Linguistics]". Similarities of the two disciplines are highlighted, such as the fact that they both acknowledge a lexico-grammar as a continuum in terms of "the occurrence of patterns which lie somewhere between abstract structures and individual lexical items or combinations of these" (Butler 2013, p.206). Much work has already been carried out from a cognitive-functional perspective (e.g., cf Davidse and Heyvaert 2007; Davidse and Breban 2019), and Fawcett (1980; 2000) also claims his model of the Cardiff Grammar to be of a cognitive-interactive stance. In particular, lexical aspect might help to work out whether there is any evidence in how Behavioural meaning is processed or show the experience of the person in processing, as shall be addressed in sections 2.4.9 and 3.2.2. The notion of lexical aspect will be returned to in section 2.4.

2.2.2   SFL and Behaviours

The behavioural process is largely representative of the Behaviour category, as stated in Chapter 1, where Behaviours were defined using literature that predominantly drew on SFL for lexico-grammatical features. These features included single participant events (intransitivity) which do not attach a *that*-complement, subject animacy and semantic attributes of psychological and physiological experiences. However, the definition of Behaviours does not include the potential of quoting as a criterion because, as shown above, this is only done in highly restricted ways as metaphorical uses (Bartley 2017, p.61) in narrative text (Martin et al. 1997, p.126). The notion of volition is also disregarded in determining a Behaviour. This is because it is ambiguous in behavioural process type classification in SFL, whereby behavioural processes are said to be both involuntary (Downing and Locke 2006, p.152), as well as voluntary counterparts of mental processes (Eggins 2004, p.250; Thompson 2004, p.103; Banks 2015, p.24).

Behavioural processes are infrequent (Matthiessen 1999; Matthiessen 2006; Matthiessen 2015), which helps us to predict that Behaviours are too. One probability profile predicted that

behavioural processes occur in around 5% of the sample, compared to material processes in 51%, relational in 23%, mental in 10%, verbal in 9% and existential in 2% (Matthiessen 1999, p.14). A second study of 6490 process types revealed a frequency of 3.5% behaviourals, compared to 37.5% relational, 37.2% material, 10.9% mental, 8.7% verbal and 2.4% existential (Matthiessen 2006, p.126). A final study of 8,769 instances shows similar low frequencies of behavioural processes; the exact figures are not outlined, but Figure 2-8 visualises the relative frequencies (Matthiessen 2015, p.22). Behavioural processes appear to be around 300, compared to materials over 3250, relationals around 3000, mentals around 850, verbals around 600 and existentials under 250.
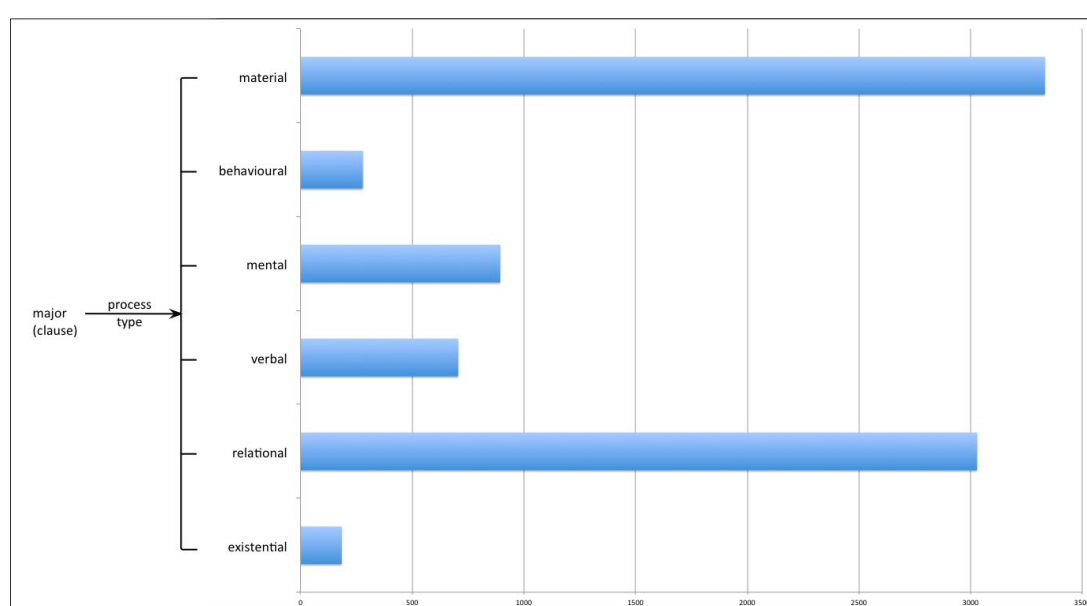
Figure 2-8: Matthiessen's (2015) Relative Frequencies of Process Types in a Registerially Mixed Sample of Texts (N= 8,769 clauses)

The infrequency of behavioural processes might be connected to a diachronic reduction in their verb types; many of the verbs referenced as becoming obsolete in English appear to include those that occur in behavioural processes, such as *bifian* (tremble / shake), *clum(m)ian* (mumble / mutter)*,* and *giscian* (sob) (van Gelderen 2018, pp.58–59). It also seems likely that their infrequency is owing to the infrequent nature of intransitives in general (see Chapter 5), as behavioural processes are typically intransitive.

The following section considers an alternative approach to verbal classification – Levin's (1993) verb classes and alternations – which takes a slightly more semantic perspective. Research has drawn similarities between SFL and Levin's (1993) research, where both

approaches acknowledge a continuum between grammar and lexis (Matthiessen 2014). Process types in SFL are located on the least delicate end of the cline (grammar), whilst Levin's verb classes are located midway between the grammar and lexis (ibid, pp.143–144).

2.3 Levin's (1993) verb classes and alternations

Levin's (1993) compilation of verb classes and alternations is one of the most prominent semantic approaches in its field and has inspired various research and research projects (cf Kipper et al. 2000; Korhonen and Briscoe 2004; Swier and Stevenson 2004; Kipper-Schuler 2005; Malchukov et al. 2010, to only name a few). Her work is based on the idea that meaning determines a verb's behaviour and verbs of similar meaning are likely to have shared syntactic behaviour (Levin 1993, p.12). Levin classifies verbs into semantic groups by their involvement in diathesis alternations, (or simply alternations), which are defined as describing "a change in the realization of the argument structure of a verb" (Sanfilippo et al. 1999, p.39) and are "sometimes accompanied by changes of meaning" (Levin 1993, p.2). Levin (1993) identifies eight core alternations with several sub-types, and under these sub-types she provides the classes of verbs that can be used in these alternations. For example, the 'induced action' alternation (see example (51)) typically has a causer inducing an act on an animate entity, and primarily concerns 'run verbs', such as *jump*, *run* and *swim* (Levin 1993, p.31).

(51) a) Sylvia jumped the horse over the fence (Levin 1993, p.31)
      b) The horse jumped over the fence (Levin 1993, p.31)

The same verb can occur in multiple alternations. For example, *appear* functions in three different constructions, that is, the 'causative/inchoative' (see example (52)), 'there-insertion' (see example (53)), and 'locative inversion' alternation (see example (54)). In the causative/inchoative alternation *appear* can only occur intransitively (Levin 1993, p.30), as an inergative construction (outlined above). In the there-insertion alternation, *there* occurs before the verb, which are typically intransitive or passive verbs (Levin 1993, p.90). The locative inversion alternation is typically found with prepositional phrases in intransitive constructions, that can be inverted.

(52) a) A dove appeared from the magician's sleeve (Levin 1993, p.30)
      b) *The magician appeared a dove from his sleeve (ibid)

(53) a) A ship appeared on the horizon (Levin 1993, p.89)
      b) There appeared a ship on the horizon (ibid)

(54)   a) A large ship appeared on the horizon (Levin 1993, p.258)
         b) On the horizon appeared a large ship (ibid)

However, in some cases not every verb of the verb class can occur in the diathesis alternation it has been classified under (Baker and Ruppenhofer 2002, pp.29–30; Hanks and Pustejovsky 2005, p.67). Baker and Ruppenhover (2002, pp.29–30) have shown that some of Levin's predictions are not attested in corpus data in the British National Corpus (BNC; version 3 (BNC XML Edition). 2007). For example, *telephone* was not found as a 'parenthetical in indirect quotations' (see example (55)) or in a dative alternation[12] (see example (56)).

(55)   *My Brother, mom had telephoned me, was now in the hospital (Baker and Ruppenhofer 2002, p.30)
(56)   *Mum telephoned me the good news (ibid)

Baker and Ruppenhover (2002 FN 2 p.30) highlight that although some individuals might regard these instances as grammatical, they were not found in any of the 1,200 instances of *telephone* in the corpus.

Alternatively, some of Levin's claims that certain verbs cannot occur in certain alternations have been disproven using corpus data. For example, Levin states that 'hold verbs' cannot be used in the conative alternation (where the verb combines with a prepositional complement headed by *at*), in which she included the verb *grasp.* However, Hanks and Pustejovsky (2005, p.72) found actual uses of *grasp* in this alternation in the BNC (see example (57)).

(57)   her hands were grasping at his coat (Hanks and Pustejovsky 2005, p.72)

Although, Levin might not classify *grasp* in this sense as a 'hold verb', as the conative alternation "describes an "attempted" action without specifying whether the action was actually carried out" (Levin 1993, p.42). As we will see below, Levin excludes several senses of verbs including *grasp* and so it is hard to tell her stance on this verb's sense in uses such as in example (57).

---

[12] The dative alternation represents an alternation between "the prepositional frame NP1 V NP2 to NP3 and the double object frame NP1 V NP3 NP2" (Levin 1993, p.47).

Levin's work reveals 47 primary verb classes, which include 150 secondary classes and 29 tertiary classes. Each verb class was formed using insights from the verb's diathesis alternations and as a result the verbs in each class have shared meanings and patterns (Tenny 1995, p.144). Thus, the verbs provide the same information but from different perspectives. Several verbs are repeated across different categories. For example, *look* is a regarded as a 'peer' verb[13], a 'stimulus subject perception' verb[14], and a 'rummage' verb[15]. The nature of this second part of Levin's verb classification will become clearer in section 2.3.1, which situates Behaviours in relation to her work.

Despite the positive contributions of Levin's work to the understanding of verb functions from a semantic perspective, some verb senses have been overlooked or even selectively ignored (Neale 2002, p.33; Hanks and Pustejovsky 2005, p.68). For example, the most commonly used sense of the verb *grasp,* as in 'understanding something', is neglected (Hanks and Pustejovsky 2005, p.72). The verb *tempt* is also only listed as an amuse verb and not in its most common sense of 'being tempted to do something', i.e. "tempted to laugh" (ibid, p.68). However, verbs taking sentential complements such as *to* infinitives "are for the most part ignored" (Levin 1993, p.18) in Levin's volume. Definitions of specific sentential complements are relatively unclear and reasons for their exclusion are not addressed. More recent work however has developed alternations that include sentential complements (cf Korhonen 2002). The verb classes were developed from intuitions and lack empirical validity (Hanks and Pustejovsky 2005, pp.67–68), which is problematic for developing accurate linguistic theory (Hanks 2013, p.307; Dąbrowska 2016b, p.484) and can lead to misleading information with "dangerous over-generalisations" (Granger 2003, p.18).

Although it would be arduous and perhaps unnecessary to provide an exhaustive list that includes every verb, a number of major verbs are not included at all in Levin's work (Neale 2002, p.33; Hanks and Pustejovsky 2005, p.68), such as *specify*, yet less common verbs are, such as *alkalify*. Phrasal verbs are also omitted, such as *work out*. Despite this, Levin does provide a detailed account for each of the 3500 (or so) verbs and her contribution to verb classification literature should not be undermined. More recent work has extended Levin's verb

---

[13] *Peer* verbs are a subclass of perception verbs, and are used intransitively with a prepositional phrase (Levin 1993, p.187)

[14] *Stimulus subject perception* verbs are similar to *peer* verbs, but take the "stimulus as the subject" (Levin 1993, p.188)

[15] *Rummage* verbs denote verbs of searching (Levin 1993, p.199)

classes (cf Dorr and Olsen 1997; Dang et al. 1998; Korhonen and Briscoe 2004), such as the development of "57 novel classes for verbs not covered (comprehensively) by Levin" (Korhonen and Briscoe 2004, p.38). An example is the novel subclass 'order verbs' to cover verbs that "direct somebody to do something" (ibid, p.41), such as *order* or *require*. For comparison, Levin (1993, p.142) classifies *order* in only one verb class, 'get verbs', with the sense of 'obtaining something'. Whilst the extension of these verb classes has been criticised for their limited practical use as "no detailed syntactic-semantic descriptions are provided", they still have the potential for useful insights within "the research community" (Kipper et al. 2008, p.22).

2.3.1 Levin (1993) and the denotation of Behaviours

Similar to many linguistic theories, Levin does not explicitly address Behaviours as a single category of its own, though Behavioural verbs are situated in various categories in her volume. Levin's (1993) work includes many Behavioural verbs such as communicative, physiological, psychological emotional and psychological perception verbs, however she generally omits psychological cognition Behavioural verbs such as *ruminate* and *ponder*.

There is a limited number of Behavioural verbs which have alternations because Behaviours are typically restricted to the 'pure' intransitive construction that lacks a transitive alternate. One common alternation that we find with Behavioural verbs is the 'cognate object' construction (Levin 1993, p.95), as shown in example (58). The cognate object construction takes several Behavioural verbs, such as *giggle* and *sneeze* under the subclass 'verbs of non-verbal expression', *dream* and *think* under 'other verbs', and *dance* under the subclass 'waltz verbs' (though whether experiences of *dancing* are Behaviours or actions is a debate within itself – see Chapter 4). As stated in section 2.2.1, the head noun in the cognate object is a nominalisation of the verb and can include modifiers to add meaning (Levin 1993, pp.95–96; Huddleston and Pullum 2005, p.305). The construction is practically intransitive, as the cognate object adds little extra meaning to the clause as a whole (Levin 1993, p.95) and cannot be made passive (Jones 1988, p.91; Moltmann 1990, p.301; Matsumoto 1996, p.201) (see examples (58) and (59)).

(58) Sarah smiled a charming smile (Levin 1993, p.95)
(59) *A weary sigh was sighed by Bill (Jones 1988, p.91)

In example (58), *smile* represents the cognate object and adds little meaning to the clause. It is the adjective *charming* that contributes to the meaning, as it describes the manner in which *Sarah* smiled.

The same Behavioural verb can be found in multiple alternations, as shown by examples (58) and (60).

(60)   Pauline smiled her thanks (Levin 1993, p.98)
(61)   Pauline expressed her thanks by smiling (ibid)
(62)   *Grateful thanks were smiled by Ted (Massam 1990, p.180)

The 'reaction object' construction in (60) is similar to the cognate object construction, but instead of a cognate object a reaction is expressed (Levin 1993, p.98). A useful paraphrase to identify this reaction is *express (a reaction) by V-ing* (see example (61)). Reaction object constructions are also intransitive and cannot be made passive, as shown in example (62).

There is no verb class solely dedicated to Behaviours in Levin's work, but rather various classes that include Behaviours: 'peer verbs'; 'marvel verbs'; 'talk verbs'; 'chitchat verbs'; 'verbs of manner of speaking'; 'verbs of bodily processes'; 'verbs of nonverbal expression'; and 'verbs of body-internal states of existence'. Alternations of verbs in these classes are used intransitively with prepositional phrase complements. These verb classes typically take animate subjects and represent psychological and physiological processes, several of which are involuntary (including those under 'verbs of bodily processes', 'verbs of nonverbal expression'; and 'verbs of body-internal states of existence'). No primary, but only secondary verb classes (i.e., sub-classes of the primary classes), include Behavioural verbs. For example, 'peer verbs' under the primary class 'verbs of perception' represent Behaviours, whilst the other secondary class 'see' verbs represents more mental experiences. The difference here is between the grammatical features, for example peer verbs are intransitive with prepositional complements and 'see verbs' are typically transitive and can occur with *that*-complements.

There are also differences within classes and some classes include Behaviours as well as verbs of other meaning. For example, the 'verbs of manner of speaking' group appears to include Behavioural experiences as well as other communicative experiences. Certain verbs can be used transitively and take a *that*-complement, which represent communicative or verbal events (see example (63)).

(63)   They whispered that the winner would be announced tonight (Levin 1993, p.205)

Other verbs, such as those that overlap with 'verbs of animal sound' (*chirp*) or 'verbs of sound emission' (*whistle*) are most likely used intransitively, representing Behavioural experiences. If these verbs were to attach a *that*-complement, these instances would likely be metaphorical as it would be very difficult to literally *whistle* words. As we saw in section 1.3.1, the definition of Behaviours in this thesis excludes the ability to attach a form of verbiage in metaphorical instances. Levin (1993, p.206) notes that the *verbs of manner of speaking* class "show an extremely complex set of properties" and therefore "the different verbs in the class might behave differently", such as transitively or intransitively. However, she does suggest that a more "careful consideration" of this class will "lead to a more refined analysis of these verbs" (ibid).

Levin's classification highlights that there are variations of lexico-grammatical features within specific verb classes, and that what are considered different categories of experience in SFL (e.g. verbal and behavioural processes), are in fact often classified together in Levin's semantic verb classes. The following section now turns to an alternative semantic verbal classification, namely lexical aspect (aktionsart).

2.4 Classification of lexical aspect (aktionsart)

Broadly speaking, aspect concerns "the semantic domain of the temporal structure of situations…and their presentation" (Smith 1991, p.1). In general, there are two main aspectual types: grammatical (viewpoint) aspect and lexical aspect (also known as 'ontological'/ 'situation' aspect, or 'aktionsart'). Grammatical aspect concerns how temporal structure is expressed by grammatical forms, whereas lexical aspect is positioned further on the cline towards the lexis and inherent temporal meaning. Whilst the verbal group is central to both types of aspect, it is not the only factor in influencing or determining aspect. For example, verb forms or markers on the verb refer to different types of grammatical aspect, although other factors play a role such as adjuncts that indicate habituality. Similarly, the verbal group plays a predominant role in representing lexical aspect, though various other clausal elements contribute to the aspectual meaning. These differences are addressed in more detail below.

Whilst the literature on aspect is vast with varying interpretations (and labels) of concepts, this section attempts to summarise the lexical aspect categories – or 'situation types' – and

discusses their classifications, drawing on key contributors such as Vendler (1957), Smith (1991) and Declerck, Reed and Capelle (2006). Despite the differences in construal of grammatical and lexical aspect, there is an interplay between these distinct concepts, which has led to differences of interpretation between researchers. Thus, section 2.4.7 defines grammatical aspect in more detail, which is necessary to explore the interplay of these two aspectual types in section 2.4.8. Finally, section 2.4.9 situates Behaviours within the aspectual literature.

Lexical aspect refers to the expression of inherent temporal meaning by lexical verbs and their arguments (Comrie 1976; Smith 1991; Declerck et al. 2006). The literature on lexical aspect is vast and can be challenging to grasp as it involves a variety of perspectives and a range of terminology. Vendler's (1957) early work into lexical aspect introduced four situation types (what he termed "time schematas") – 'state', 'activity', 'accomplishment' and 'achievement'. Situation types are the different aspectual classes that denote "the temporal structure of situations" (Smith 1991, p.xvii). Each situation type is defined in detail below, but a very brief overview is provided here: states are non-dynamic situations (*feel unwell*); activities are dynamic and durative situations with no inherent endpoint (*walk, run*); accomplishments are dynamic and durative situations with an inherent endpoint (*build a house*), and achievements are dynamic and punctual situations (*win a race*). Whilst Vendler's research laid an essential foundation to the field of aspect, it focusses largely on verb categorisation (though as Koenig (2016, p.389) highlights, it's generally hard to tell exactly what is being classified). Later works have been seminal in recognizing the importance of other clausal components (Verkuyl 1972; Smith 1991; Rothstein 2004b; Declerck et al. 2006), where the verb has the potential to construe multiple situation types depending on the clause it occurs in (Rosen 1999, p.5). For example, the difference in situation type between *I went cycling* (activity) and *I cycled to the shops* (accomplishment) is influenced by the telic prepositional phrase *to the shops*. Thus, expression of situation types is influenced by the verb and other clausal components such as subjects, direct objects, complements and adjuncts (Van Rompaey 2013, p.195). These influences are described in more detail below.

On top of Vendler's (1957) four situation types, a fifth situation type was introduced by Smith (1991), labelled 'semelfactives', to refer to punctual, repetitive situations such as *knocking* or *sneezing* (see below for full definition). In this thesis, the terms 'activity', 'accomplishment', 'state' and 'semelfactive' are all used, and the situation type 'achievement' will be referred to

as 'culmination' (Moens and Steedman 1988) hereafter because semelfactives are included in Vendler's (1957) classification of achievements, and therefore using the subclassifications culmination and semelfactive better distinguishes the two types of achievements. These five situation types have detailed criteria and provide useful analyses for lexical aspect. It is worth noting that different literature outlines different taxonomy of aspect. For example, Lyons (1977) proposed a four-way taxonomy of 'states', 'actions' 'processes' and 'events'. Whilst this classification is detailed and interesting, it is not always explicitly clear. For example, Declerck et al. (2006, p.70) highlight the "puzzling nature" of their classification, particularly in determining whether 'processes' are agentive, non-agentive or both. Thus, lexical aspect is best considered in terms of the widely referenced five situation types outlined above (state, activity, accomplishment, culmination, semelfactive). In what follows, these five situation types are defined with examples.

Each situation type has defining criteria, which includes whether the clause is: dynamic or stative; durative or punctual (a sub-type of dynamicity); transitional or non-transitional (a sub-type of punctuality); evolving or non-evolving (a sub-type of durativity); telic or non-telic; and agentive or non-agentive. These criteria are described in sections 2.4.1-2.4.6 and a brief overview is provided here. Firstly, 'states' are non-dynamic, atelic, non-agentive events such as *feel unwell*. 'Activities' on the other hand are dynamic and durative, with multiple, distinguishable phases and a change in the process. They are also atelic meaning that there is no inherent end point, such as *walk or swim*. 'Accomplishments' are similar to activities, though they are telic – a common example of an accomplishment is *build a house*, where the process is not carried out until the end (a house is not built if you stop halfway through, whereas a person has run if they stop running after a period of time). 'Culminations' are dynamic and telic, though they are punctual instead of durative, meaning that there is an instantaneous change in the process and they do not last in time, such as *win a race*. Finally, semelfactives are also dynamic, telic and punctual, but differ from culminations as they are non-transitional i.e., there are no preliminary stages leading up to the events. Semelfactives can also be recognised from the representation of repetitive sequences, such as *blink* or *knock*. This summary is presented in

Table 2-2, with the selected labels in bold. The following sections (2.4.1-2.4.6) describe each criterion (e.g. dynamicity vs. stativity) in succession.

Table 2-2: A summary of situation types adapted from Van Rompaey's (2013)

	Dynamicity and durativity	Telicity	Agentivity
State (Vendler 1957; Moens and Steedman 1988)	Stative	-	-
Activity (Vendler 1957) or process (Moens and Steedman 1988)	dynamic durative or evolving	-	+
Accomplishment (Vendler 1957) or culminated process (Moens and Steedman 1988)	dynamic durative	+	+
Culmination (Moens and Steedman 1988) or achievement (Vendler 1957)	dynamic punctual transitional	+	+
Semelfactive (Smith 1991), achievement (Vendler 1957), series (Brinton 1988) and point (Moens and Steedman 1988)	dynamic punctual non-transitional	-	+

2.4.1 Dynamicity and Stativity

Dynamic events involve a "change, motion or activity", from an agent (see section 2.4.2 below) or external force (Van Rompaey 2013, p.196). The stages in a dynamic event are each slightly different from the previous, such as changing body positions whilst walking (Declerck et al. 2006, p.51). Stative situations represent states that exist as opposed to occurring, and are unchanging/homogenous in terms of their stages (ibid). They tend to be revealed by typical stative verbs, such as *be, have,* and *seem*, but also include verbs that represent unobservable mental processes, such as *feel, love* and *know* (Van Rompaey 2013, p.198). The importance of the verb's arguments is highlighted here, as the same verb can be used in both stative and dynamic clauses, such as *feel good* versus *feel for the light switch* (Quirk et al. 1985, pp.204–6; Smith 1991, pp.82–3; Van Rompaey 2013, p.198). Of the five situation types, states are classified as stative, and the remaining four are classified as dynamic (see Table 2-2).

Several tests for stativity include the lack of an agent (see section 2.4.2), however this causes issues with regard to dynamic events with no agent. To resolve this issue, a test can be used which is concerned with pseudo-cleft constructions; the stative clauses will not allow periphrasis with *do* (Dowty 1979, p.55; Smith 1991, p.68), as in (64), compared to the durative event in (65).

    (64)   *What John did was know Greek (Smith 1991, p.68)
    (65)   What John did was wash the car (ibid)

Additionally, stative situations cannot have adjuncts of manner relating to speed, such as *quickly* or *slowly* (Dik 1997, pp.107–108; Van Rompaey 2013, p.197). An example can be seen in (66), compared to the durative situation in (67).

    (66)   The substance was red (*quickly) (Dik 1997, p.108)
    (67)   John opened the door quickly (Dik 1997, p.107)

2.4.2   Agentivity

The agentivity of a situation is determined by whether it is performed by an agent or instigator (agentive) or simply happens (non-agentive, Van Rompaey 2013, p.206). An agent "is responsible for the actualization of the situation, in the sense that it actually does something that induces the situation to actualize" (Declerck et al. 2006, p.53). An example is shown in (68), compared to the non-agentive state in (69).

    (68)   She's walking home now (Declerck et al. 2006, p.53)
    (69)   Bill is an old man (ibid)

Agency is closely linked with dynamicity/stativity, as stative situations are characteristically non-agentive (as stated in section 2.4.1) and dynamic situations are typically agentive. As discussed in section 2.1.1, agents are not always expressed in the clause such as in ergative constructions that have an external force. Scholars do also reference occasional non-agentive dynamic situations, such as *fall down* (Declerck et al. 2006, p.53; Van Rompaey 2013, p.197).

Agents are typically animate but it is also possible to have an agentive reading on an inanimate entity (Cruse 1973, p.16; Declerck et al. 2006, p.53). As Cruse (1973, p.16) states, "inanimate objects can, as it were, acquire a temporary 'agentivity' by virtue of their kinetic (or other) energy" (see example (70)). Metonymy also allows agentive inanimate objects, for example

when an organisation represents the people working for that organisation (Van Rompaey 2013, p.207).

(70)   The bullet smashed John's collar-bone (Cruse 1973, p.16)

Non-agentive events are generally considered incompatible with the imperative form (Dowty 1979, p.55; Rothstein 2004b, p.15; Van Rompaey 2013, p.206). This can be seen in example (71), which is agentive, and (72) which is non-agentive.

(71)   Tell the story! (Van Rompaey 2013, p.207)
(72)   *know the answer! (Dowty 1979, p.55)

However, it is not clear how well attested this is in corpus data. In English, imperatives can be used to express a desire of the speaker in non-agentive clauses, such as *be happy!* (Verhoeven 2010, p.223). A second test to help identify agentivity is the compatibility with verbs such as *to force* and *to persuade* (Dowty 1979, p.55; Van Rompaey 2013, p.207) (see examples (73) which is agentive, and (74) which is non- agentive).

(73)   He forced him to tell the story (Van Rompaey 2013, p.207)
(74)   *John forced Harry to know the answer (Dowty 1979, p.55)

Finally, whilst some adverbials express agentivity such as *deliberately*, a situation does not have to be intentional to have an agent. In other words, intentionality and agentivity are independent features (Cruse 1973, p.19; Smith 1991, p.59), such *break the vase* or *fail the test* (Van Rompaey 2013, p.207).

2.4.3   Durativity and Punctuality

Events that are durative have multiple, distinguishable phases whereas punctual events have a single phase and only need a moment to actualize (Declerck et al. 2006, p.57; Van Rompaey 2013, p.199). Of the five situation types, activities and accomplishments are durative whilst culminations and semelfactives are punctual (see Table 2-2). One identifying test is that the complement of *stop* corresponds to durative (see example (75)) but not punctual events (see example (76)).

(75)   He stopped telling the story (Van Rompaey 2013, p.199)
(76)   *He stopped choosing the president (Van Rompaey 2013, p.199)

Another test for durativity is the compatibility with adverbs of duration, such as 'for months' (Declerck et al. 2006, p.59). Durative events can take these adjuncts whereas punctual events depend on the situation (see example (77)).

(77)   He ran for five hours (Van Rompaey 2013, p.199)
(78)   * Jill reached the church for three hours (Declerck et al. 2006, p.59)

However, neither of these tests apply to situations that are created from repetition of punctual situations i.e., when the event is a series of a single action. These are commonly recognised as semelfactives, which are non-transitional (see section 2.4.4 for further detail on the transitionality of punctual events). The 'stop' test in example (79) construes the person stopping in between knocks, as opposed to in the middle of a knock. The durative adverbial in example (80) construes someone knocking consecutively for five seconds. The following section describes the punctual sub-type of transitionality in more detail.

(79)   He stopped knocking on the door (Van Rompaey 2013, p.199)
(80)   He knocked on the door for five seconds (ibid)

2.4.4   Transitionality

Transitionality is classed as a subtype of punctuality. Transitional situations involve a single moment of change from one state to another (Kearns 2000, p.204; Declerck et al. 2006, p.59), such as *dying, killing, choosing a president, winning a race, passing a test* etc. In the progressive form, the transition cannot "form part of the 'middle' part of the situation"; in the clause *John was dying*, *John* has not yet died (Declerck et al. 2006, p.59). Therefore, transitional situations in the progressive typically focus on the preliminary stages of the situation (Smith 1991, p.97; Kearns 2000, p.217; Leech 2004, p.24). The interplay of progressivity (in the grammatical aspect) and transitional events is a complex phenomenon and is addressed in section 2.4.8. The notion of preliminary stages is a key difference between transitional and non-transitional situations, whereby transitional ones have stages leading up to the event itself whereas non-transitional do not (Kearns 2000, p.204; Van Rompaey 2013, p.200). For example, passing a test involves the revision and active taking of that test before it is possible to pass. Another difference is that non-transitional events tend to represent repetitive situations, such as *coughing,* whereas transitional events do not.

2.4.5 Evolvement

Evolvement is classed as a subtype of durativity, because "evolution takes time" (Declerck et al. 2006, p.65). Evolving situations are characteristic of the activity situation type, and represent a gradual change or development, such as *increasing*, *changing, improve* etc. Other representations include verbs of quality, or "verbs derived from gradable adjectives", such as *get dark* or *widen* (Van Rompaey 2013, p.202). Adverbials of change, such as *less and less* or *increasingly,* have been shown to indicate evolvement (Smith 1991, p.84; Van Rompaey 2013, p.202). This is evident in example (81).

(81)   These examples seem less and less unacceptable to me (Smith 1991, p.84)

2.4.6 Telicity

A telic event is one that has a natural or inherent endpoint "beyond which the situation…cannot continue" (Declerck et al. 2006, p.60). For example, the event *pushed his mountain bike into the garage* in example (82) has reached an endpoint and does not continue.

(82)   John pushed his mountain bike into the garage (Declerck et al. 2006, p.60)

Declerck (2006, p.61) emphasises the difference in grammatical and lexical aspect when determining the telicity of a situation. For example, in *John wrote a book* the situation is bounded, and in *John was writing a book* the situation is unbounded (see the grammatical aspect classification in section 2.4.7). In terms of lexical aspect, both situations are telic as both situations develop towards a natural endpoint.

Atelic (non-telic) events have arbitrary endpoints, and therefore can stop at any moment rather than a specific one (Smith 1991, p.29). An atelic situation is shown in example (83). This example highlights the importance in determining situation types by more than just the verb, as *driving* could be telic in specific situations such as *driving to the petrol station.*

(83)   John drove the car (Declerck et al. 2006, p.60)

One test for telicity is the addition of "completive duration adverbials" – such as *in an hour* – whereby telic events can take them but atelic events cannot (Rothstein 2004b, p.26). Examples are shown in (84) and (85) respectively.

(84)   Mary painted a picture in an hour (Rothstein 2004b, p.26)
(85)   *John pushed the cart in an hour (Rothstein 2004b, p.26)

Atelic events can take non-completive duration adverbials such as *for an hour*, whilst telic events occur less frequently with these (Dowty 1979, p.56; Van Rompaey 2013, p.203). Dowty (1979, p.57) highlights that the difference is in entailment: "If John walked for an hour, then, at any time during that hour it was true that John walked. But if John painted a picture for an hour, then it is not the case that he painted a picture at any time during that hour".

Another test for telicity is to use *finish* or *complete* with the gerund form of the verb phrase (Declerck et al. 2006, p.62). The telic event in (86) if compatible with *finish,* whereas the atelic event in (87) is not.

(86)   I finished repairing the roof (Declerck et al. 2006, p.62)
(87)   *He finished being their leader in 1988 (ibid)

(Un)specified quantity of direct object complements can determine (a)telicity, whereby a specified quantity indicates a telic event (Van Rompaey 2013, p.204); *write a/the book* represents a telic situation, whilst *write letters* is atelic. Prepositional complements can also restrict the progress of the event, such as *running to Paris* (ibid).

Telicity is a key distinguishing factor between activities (atelic) and accomplishments (telic). Culminations are telic as there is an inherent termination at the culmination point, whilst semelfactives are typically atelic because the repetitive event has no indication of an inherent endpoint[16]. States are also typically atelic, although cases of inchoative readings (as in *begin to*) are telic, such as *it took John an hour to be happy (again)* (Rothstein 2004b, p.27).

In summary, this section so far has outlined the criteria that are used to classify lexical aspect. Whilst these criteria are relatively clear in theory, identification of situation types is not always straightforward because the theoretical descriptions fail to account for certain attested uses (as we see in section 4.3.2.2). Additionally, Shirai (2013) highlights that specific instances might be analysed as two different situation types, such as the posture verb *to sit* as either a state or activity. The main reasons for these discrepancies concern the interaction of grammatical and

---

[16] Some scholars take the view that telicity is not regarded as a classification of punctual events because a development towards a natural endpoint requires duration (Declerck et al. 2006, p.62). Therefore, semelfactive and culmination situation types are not always analysed for telicity.

lexical aspect. The following section provides an overview of grammatical aspect, which is intended to prepare the reader for the exploration of grammatical and lexical aspect interactions in section 2.4.8.

2.4.7   Grammatical Aspect

Grammatical aspect refers to the expression of temporal meaning by grammatical forms (Declerck et al. 2006, p.28). It denotes the flow of an event from the speaker's perspective, hence why it is also labelled 'viewpoint' aspect (Brinton 1988, p.3). The representation of grammatical aspect depends on whether the speaker refers to the situation as a whole (perfectivity) or at a specific point of that event (imperfectivity) (Comrie 1976, p.3; Declerck et al. 2006, p.28). A perfective clause is often referred to as 'complete', although this does not necessarily mean the event has been completed. For example, some clauses refer to an event that will happen in the future but is still "referred to in [it's] entirety" (Declerck et al. 2006, p.30). Evidence for this is shown in the perfective clause in example (88).

(88)   I will write an essay tomorrow (Declerck et al. 2006, p.30)

Perfectivity concerns boundedness, meaning the situation has "reached a temporal boundary" (Depraetere 1995, p.3). Conversely, an imperfective clause is unbounded, and "represents the internal temporal structure" of an event (Declerck et al. 2006, p.31). Unboundedness describes situations that haven't reached a temporal boundary (Depraetere 1995, p.3) and either represent stativity, or focus on the beginning (ingressive), middle (progressive) or end (egressive). In terms of stativity, imperfective clauses concern situations that are constant through time (Langacker 1987, pp.254–255). An example of an unbounded imperfective clause is shown in (89), where the state of hair being green or someone being tall is constant and does not change through phases in time.

(89)   His hair is green / He is tall (Van Rompaey 2013, p.186)

This example contrasts with perfective clauses that relate to a change through time, or 'dynamism' (as discussed in section 2.4.1). For example, (88) shows a bounded clause that can be split into smaller phases of the event, which differ in certain ways from another phase.

As well as stativity, imperfective aspect can also focus on the beginning (ingressive), middle (progressive) or end (egressive) of the situation. These three imperfective types represent

situations in which the component phases of the situation differ (as with the perfective aspect) yet the clause is still unbounded, as opposed to identical component phases in stative situations (Van Rompaey 2013, p.186). The ingressive viewpoint occurs at the initial phase and the situation is represented as just beginning (Declerck et al. 2006, p.31) (see example (90)). These semantic distinctions of phase describe languages more generally, compared to language-specific grammatical realisations.

(90)   She began to cry (Declerck et al. 2006, p.31)

In ingressive viewpoint, the event is presented as bounded to the left and the final boundary is ignored (to the right), as there is no information on the completion of the event (Van Rompaey 2013, p.188). There is no special verb form to convey ingressive aspect; it is conveyed through aspectual lexical verbs (namely aspectualizers) such as *start* and *begin* (Declerck et al. 2006, p.31).

The egressive viewpoint – also known as 'terminative' – occurs at final phase, and so the event is presented as bounded to the right. The initial stage is ignored (to the left) as there is no information on the onset of the event. Egressive aspect is also conveyed through aspectualizers, such as *stop* and *finish* (see example (91)).

(91)   He finished painting the wall (Declerck et al. 2006, p.31)

Finally, the progressive viewpoint ('durative', 'continuous') occurs at the middle phase, neglecting initial and final phase (see example (92)).

(92)   I was reading a book (Declerck et al. 2006, p.31)

In other words, the clauses represent events that have already started and will potentially continue (Declerck 1991, p.157), though it is not within the progressive viewpoint to confirm this. In English, the progressive aspect has a specialised verb form, structured as *be V-ing*.

Whilst the meanings of boundedness and telicity are similar (in terms of temporal boundaries), these parameters should be considered separately as they are concerned with different presentations of temporal structures (cf Declerck et al. 2006, sec.1.47; Crainiceanu and Baciu 2009). For example, telicity concerns how the speaker "conceptualizes" a situation with a

predominant focus on the verb phrase, whilst boundedness concerns how the speaker "represents" the temporal structure of the clause (Declerck et al. 2006, p.77).

2.4.7.1 *Iterative and Habitual aspect*

Whereas perfective and imperfective aspect cannot be construed simultaneously, 'iterative' and 'habitual' aspect can occur at the same time and be incorporated with both perfectivity viewpoints (Van Rompaey 2013, p.190). These viewpoints provide information on the frequency of an event, and can both be expressed by "lexical elements such as adverbials" (ibid, p.192). Firstly, iterativity concerns the repetitiveness of an event, in terms of an event reoccurring on a separate occasion or a reoccurrence in the same event (Declerck et al. 2006, p.35) (see examples (93)-(95)).

> (93)   I phoned him twice (Van Rompaey 2013, p.190)
> (94)   Over 1,000 people have visited the exhibition so far (Declerck et al. 2006, p.36)
> (95)   Someone was tapping on the window (Declerck et al. 2006, p.36)

Iterative events can be expressed by repetitive adverbials, e.g. *repeatedly*, frequency adverbials, e.g. *sometimes*, or "a plural or collective subject or complement NP accompanied by a non-progressive tense form" (Declerck et al. 2006, p.36). Punctual repetitive situations are represented in durative forms, such as the progressive in (95).

Habituality concerns situations that are "characteristic of the referent of the subject NP over a certain period of time" (Declerck et al. 2006, p.34). They can be identified by repetitive adverbials, e.g., *usually*, or durative time adverbials, e.g., *these days* (see example (96), as well as context. An example of using context to identify habituality can be seen in (97), which states what someone's current occupation is at that moment in time. In the past tense, habituality is expressed by the semi-auxiliary *used to,* or the auxiliary *would* (see example (98)). The auxiliary *will* can be used to refer to a present habit, as shown in (99).

> (96)   We aren't eating any beef these days because pork is exceptionally cheap (Declerck et al. 2006, p.35)
> (97)   He sells cars (Van Rompaey 2013, p.191)
> (98)   He {would often / used to} come and talk to her when he had finished working (Declerck et al. 2006, p.35)
> (99)   On the weekends, he will sleep until 11am (Declerck et al. 2006, p.35)

This section has compared perfective and imperfective instances, and also discussed habituality and iterativity. Now we have a clearer understanding of grammatical aspect, this review moves on to its interaction with lexical aspect.

2.4.8   Interactions of grammatical and lexical aspect

Whilst grammatical and lexical aspect provide different perspectives on the temporality of situations in different ways, they interact to create full meaning. The interaction of grammatical and lexical aspect and the potential dominance of one aspectual type is debated within the literature. For example, Declerck et al. (2006, p.49) state that "grammatical aspect may sometimes overrule the ontological aspect of the unmarked verb phrase" (ontological meaning lexical aspect). However, this view overlooks inherent temporal meanings in the lexical aspect of situations. This thesis considers Olsen's (1997, p.16) view that "grammatical aspect acts as an overlay on lexical aspect" to be most suitable, which shall be justified below.

Following the view that grammatical aspect overrules lexical aspect, the progressive form in the present tense is interpreted as referring to a dynamic event, such as *John is walking to work,* whereas the non-progressive form in the present tense is interpreted as referring to a state, such as *John walks to work* (Declerck et al. 2006, p.49). However, interpreting these present tense event verbs as states disregards the inherent dynamicity of such events. As Kearne (2000, p.201) states, "the aspectual characteristics of events (that is their internal structures in time) are already coded to some extent in the basic verb phrases which are the predicates on events", highlighting their inherent temporal meanings such as dynamicity. It is also widely acknowledged that activities in the simple present tense have a habitual reading (Dowty 1979, p.60; Brinton 1987; Levin 2009; Kearns 2011, p.179), indicating the interaction of both perspectives rather than overruling the grammatical aspect. Following this, examples such as *John walks to work* can still be interpreted as habitual (grammatically) as well as dynamic (lexically) – in this case an accomplishment. We will now move on to alternative support for the interpretation that grammatical aspect does not overrule lexical aspect, in the discussion of progressive aspect and situation types.

Another interaction between grammatical and lexical aspect involves the progressive aspect and culminations or accomplishments. Instances like these can be challenging to analyse, as the interaction skews the temporal interpretation that is being construed. When an

accomplishment occurs in the progressive form, it does not entail that the event reaches "the resultant state" (Van Rompaey 2013, p.228), and therefore might be considered atelic. For example, Radden and Dirven (2007, p.184) recognise these situations as giving an activity reading and label them 'accomplishing activities'. Similarities between activities and progressive accomplishments can be drawn, including both situations being able to take time adverbials such as *for an hour*. However, there is still a strong expectation that progressive accomplishments will be completed. As we saw in sections 2.4.6 and 2.4.7, telicity should be regarded separately to progressivity when determining situation types (Declerck et al. 2006, p.61). As Van Rompaey (2013, p.229) states, the ambiguity "is, however, resolved when telicity is recognized as a lexical aspect parameter, i.e. when potential termination is part of the situation type and not encoded in the progressive form." Additionally, there are clear differences in activities and accomplishments, in what is known as 'the imperfective paradox' (Dowty 1977; Dowty 1979), or as Bach (1986) labels, the 'partitive puzzle'. In this paradox, progressive activities entail that the event has occurred (see example (100)), whilst progressive accomplishments do not (see example (101)), which "allows us to distinguish between them" (Rothstein 2004b, p.22).

(100) John is singing ENTAILS John has sung (Comrie 1976, p.44)
(101) John is making a chair DOES NOT ENTAIL John has made the chair (ibid)

Though accomplishments and activities easily occur in the progressive form, the interaction of culminations in the progressive form has "puzzled linguists considerably" (Rothstein 2004b, p.36). Rothstein (2004a, p.542) points out that the "received wisdom has been that achievements do not appear in the progressive" because progressive aspect presents ongoing situations, whereas culminations present punctual situations that lack duration. Note that whilst semelfactives are also punctual (as outlined in section 2.4.3 above), the progressive form attributes duration to semelfactives as a series of events (Leech 2004, p.24). By contrast, culminations in the progressive form have proved more challenging (see examples (102) and (103)). Certain instances, such as the example in (102), are accounted for as exceptions of "well-defined procedure[s]" (Rothstein 2004b, p.37). Additionally, it is generally agreed that culminations in the progressive form indicate the lead up to a transition rather than the culmination itself (Smith 1991, p.97; Kearns 2000, p.217; Leech 2004, p.24), as in example (103). In other words, the focus includes the "preliminary" (Smith 1991, p.237) or "preparatory" (Mittwoch 1991, p.72) stages of the event.

(102) Dafna is finding her shoes (Rothstein 2004b, p.36).
(103) The old man is dying (ibid)

Progressive culminations induce an imperfective paradox, for example *he is dying of disease* does not entail *he has died of the disease* (Rothstein 2004b, p.39). Similar to progressive accomplishments, some linguists argue that the progressive form converts situations such as these into activities (Brinton 1998, p.48), though as stated above, grammatical aspect should overlay as opposed to override lexical aspect. This perspective is supported by Hayvaert, Maekelberghe and Buyle (2019, p.42), who (despite focussing on gerunds of the nominal form) argue that the conversion of situation types by progressive aspect is an overgeneralisation. Additionally, although certain linguists group culminations and accomplishments together (Verkuyl 1989), differences in their aspectual structures indicate that culminations cannot be disguised accomplishments (cf Rothstein 2004b section 2.3 for a full explanation). For example, Rothstein (2004b, p.40) shows differences in temporal modifications, such as *for//in α time* adverbials. Moreover, Kearns (2011, p.166) uses examples (104) and (105) to exemplify the difference between culminations and accomplishments in the progressive.

(104) Jones was dying for months and finally died just before Christmas (Kearns 2011, p.166)
(105) *Jones was building that house for months and finally built it just before Christmas (ibid)

In addition to this, Dowty (1986, pp.42–43) recognises the compatibility of culminations in the progressive form. He shows that they can be recognised by the ability of one state replacing another, such as being alive or dead in the event of *dying*. These can be contrasted with accomplishments which have sub-stages, such as laying foundations and raising walls when building a house. These instances of progressive culminations are described as 'abstract/ derived accomplishments' in Rothstein (2004b, p.48) and 'culminating activities' in Radden and Dirven (2007, p.181). Whilst these are useful descriptions of the durative nature of the preliminary stages of the event, the labels are focused on this durative property rather than the culmination part. Therefore, this thesis adapts 'culminating activities' to 'activity-culminations' instead, to remain focussed on the culmination characteristic of the situation. For the same reasons, I change the label of Radden and Dirven's (2007, p.184) 'accomplishing activities' (outlined above) to 'activity-accomplishments'. These intermediary classes are supported by Mittwoch (1991, p.82), who suggest that intermediary categories of Vendler's (1957) situation types are needed for certain purposes (see Figure 2-9 for a visualisation of

situation type with intermediary categories). The following section now considers where the category of Behaviours is situated within aspectual theory.

```
┌─────────────┐      ┌──────────────┐      ┌─────────────┐      ┌──────────────┐      ┌────────────────┐
│             │      │ Activity –   │      │             │      │ Activity –   │      │                │
│             │      │ Culmination  │      │             │      │ Accomplishment│     │                │
│ Culmination │ ◄─── │ e.g., The baby│◄─── │  Activity   │───►  │ e.g., Ann is │ ───► │ Accomplishment │
│             │      │ is falling    │      │             │      │ changing the │      │                │
│             │      │ asleep        │      │             │      │ nappy        │      │                │
│             │      │ (Radden and   │      │             │      │ (Radden and  │      │                │
│             │      │ Dirven        │      │             │      │ Dirven       │      │                │
│             │      │ 2007, p.181)  │      │             │      │ 2007, p.181) │      │                │
└─────────────┘      └──────────────┘      └─────────────┘      └──────────────┘      └────────────────┘
```

Figure 2-9: A visualisation of the adapted situation type framework

2.4.9   Aspect and Behaviours

According to the literature, Behavioural verbs most naturally occur in the progressive (-*ing*) form (i.e., imperfective progressive aspect) when referring to the 'right now' (Martin and Matthiessen 1992, p.363; Halliday 1994, p.116; Langacker 2008, p.148), for example, *she is {sleeping / dreaming / perspiring}* rather than *she {sleeps / dreams / perspires}*. The preference of the progressive is a notion we have seen in the definition of a Behaviour (section 1.3) and in Behavioural processes in SFL (section 2.2.1), and one that will also be re-addressed in the following chapter (section 3.1). Whilst claims have been made about the interaction between Behaviours and grammatical aspect, the inherent temporal meaning (i.e. lexical aspect) of Behaviours is not as well-documented. In a brief review of Vendler's (1967) examples of situation types, Halliday and Matthiessen (1999, p.471) identify the potential Behaviour *think about* as an activity, and add their own Behavioural verbs to the activity category, including *ponder*, *listen to*, *look at*, and *smile*. However, the verb phrase alone is not enough to determine their situation type. For example, instances of *listen to* can represent activities or accomplishments depending on the goal in the prepositional complement. This aspectual potential emphasises the need to consider more than the verb when determining the situation type, as has been established above. Halliday and Matthiessen (1999, p.471) do highlight this, where they argue that Behaviours "with a delimited range would not presumably be classified as activities, because they are bounded".

There is negligible acknowledgement of aspectual features, both grammatical and lexical, in relation to Behaviours in Levin's (1993) work (outlined in section 2.3). The verb classes that include Behavioural verbs do not typically address the grammatical aspect of these verb types (such as progressivity), or situation type features (such as telicity, agentivity or durativity). The alternations give slightly more information on aspectual features, though this is still minimal. For example, the 'swarm' alternation is displayed with imperfective progressive aspect, which includes Behaviours such as *crying*, *trembling*, and *sweating* (Levin 1993, pp.53–4). Lexical aspect features are shown in 'directional phrases with nondirected motion verbs', which include sound-emission Behaviours such as *crying* or *murmuring* (ibid, pp.105–6); it is stated that without a goal prepositional phrase the situations are activities in Vendler's (1957) terms. Instances with a goal prepositional phrase are accomplishments, though it is unlikely Behaviours would occur with these as it creates an extended sense of "go by V-ing", which imposes an action as opposed to Behaviour reading.

Literature has pointed towards a link between the intransitive verb type 'unergative', under which Behaviours typically fall (Levin and Rappaport Hovav 1995, p.137), and lexical aspect (Tenny 1987; Dowty 1991; van Gelderen 2018). As we saw in section 2.1.2, with unergative verbs the element in subject position is always the subject and never becomes the object, such as *Mia is coughing.* Unergatives have been identified as typically atelic (Dowty 1991; Levin and Rappaport Hovav 1995, p.71; van Gelderen 2018, p.10), a feature of activities, with the Behavioural verb *talk* used as an example (Levin and Rappaport Hovav 1995, p.71). Tenny (1987, p.264) also classes unergatives as non-delimited events, which have no fixed length of time and include activities. Finally, Behavioural verbs are found as examples of situation types in lexical aspect literature. For example, *coughing* (Brinton 1988, p.38; Smith 1991, p.28; Rothstein 2004b, p.28; Kearns 2011, p.159) and *sneezing* (Quirk et al. 1985, p.201; Kearns 2011, p.159) are typically outlined as a semelfactive, whilst *crying* (Smith 1991, p.112; Rothstein 2004b, p.22; Van Rompaey 2013, p.213), *laughing* (Smith 1991, p.6), *thinking about* (Vendler 1967, p.152; Smith 1991, p.38), *chatting* (Brinton 1988, p.49; Kearns 2011, p.158), *looking* (Brinton 1988, p.49) etc., are regarded as activities. However, classifying unergatives, or outlining specific Behavioural verbs, as one situation type is too rigid, because as section 2.4 has shown, complements and adverbials of the verb can affect the telicity of a situation (Mourelatos 1978; Smith 1991; Declerck et al. 2006).

Overall, this review of literature indicates a strong consensus of Behaviours in the imperfective progressive aspect (as we have seen from the definition in section 1.3), and hints at a relation between Behaviours and activities in terms of lexical aspect. Nonetheless, there is a clear dearth of literature explicitly connecting Behaviours and lexical aspect, providing a gap in the research to be addressed – this will be readdressed in section 3.2.2.

2.5 Concluding the intransitivity and verbal classification review

This chapter has reviewed research on intransitivity and considered various approaches to verbal classification, in order to situate this thesis within the literature. Descriptions of (in)transitivity have been outlined in section 2.1, including current classifications of their syntactic and semantic features. A contrast was then made between the ergativity system and transitivity system, revealing the different types of intransitive alternations (section 2.1.1). A key term to come out of this review is the notion of 'pure' intransitives (intransitives that do not alternate with a transitive form), which are the typical construction of Behaviours and are at the forefront of this research. We have seen from section 2.1.2 that intransitive verbs are classified by their semantics (cf Perlmutter 1978; MacWhinney 1999; Levin and Hovav 2005; Dryer 2007), but also in terms of their syntactic relations (cf O'Grady 1980; XTAG Research Group 2001). From an alternative perspective to verb classification, intransitives can be classified according to constructions or patterns, as shown in section 2.1.3.

This chapter has also explored different approaches to verbal classifications on a cline of lexico-grammar. In particular, focus has been on the category of Behaviours (introduced and defined in Chapter 1) and several sections have considered its position within the literature. The verbal classifications have shown that language does not fit neatly into categories, but rather there are borderline cases and 'indeterminacies'. In particular, sections 2.2.1 and 2.2.2 introduced the indeterminacy of Behaviours from an SFL perspective. Section 2.2.1 indicated that the behavioural process, representative of Behaviours, is the most challenging process type to categorise. Its lexico-grammatical features overlap with other process types, especially material processes, which raises questions about this category (although this was only touched on and the following chapter explores this area in depth). Alternative verb classifications, namely Levin's (1993) verb classifications and lexical aspect, were presented in sections 2.3 and 2.4 respectively. Whilst both approaches offer valuable insights into how we can categorise and represent experiences, as with most classifications in linguistics, it is not always

straightforward, and indeterminacies or ambiguities in categorisation can occur. Behaviours were situated in relation to both these approaches, revealing alternative ways in which these experiences can be classified. In particular, the lexical aspect review revealed that the situation types of Behaviours could be explored in more depth, to give more insights into the nature of this category.

This chapter has also highlighted another central concern of this research; the benefit of using real language data to develop or attest theoretical claims, as opposed to using researcher intuitions (sections 2.2.1 and 2.3). The lexico-grammatical features of Behaviours are currently based on theoretical claims, motivated particularly from SFL. Thus, the indeterminate nature and ultimately lack of attested theoretical claims of Behaviours is central to the following chapter, which presents the first study of this thesis, namely the 'Behaviours' study. This Behaviours study incorporates Corpus Pattern Analysis (Hanks 2004a) with grammatical and lexical aspectual analysis to empirically evaluate the theoretical description of the Behaviours category.

3. Exploring Behaviours and their indeterminacies

So far in this thesis, section 1.3 has established the definition of a Behaviour and Chapter 2 has used theoretical literature to demonstrate where Behaviours fit into different grammatical systems and categorisations. The inclusion criteria for a Behaviour is repeated here for ease of reference: Behaviours are semantically defined as "outer manifestations of inner workings, the acting out of consciousness and psychological states" (Halliday and Matthiessen 2014, p.215). The first participant, the Behaver, is typically animate. The constructions in which they appear are typically intransitive and do not bear another clause in the form of a *that*-complement. Finally, they favour the progressive form in the present tense.

This chapter presents the first empirical study of this thesis, which focuses on the nature of Behaviours (and shall be referred to as the 'Behaviours study' from here onwards). Behaviours are interesting as they tend to lack defining characteristics that distinguish them from other verbal categories, especially from an SFL perspective (as will become clearer in this chapter). Specifically, this Behaviours study addresses the first aim of this thesis: to empirically evaluate the extent to which intransitive behavioural verbs exhibit sufficiently similar semantic and lexico-grammatical features which justify the Behavioural categorization.

The organisation of the chapter is as follows: section 3.1 presents the fuzziness and challenges that arise when identifying the characteristics of the Behaviours category, with reference to Systemic Functional Linguistics (SFL; 3.1.1), Cognitive Grammar (3.1.2), and Levin's verb classes and alternations (3.1.3). Section 3.1.4 motivates the aims and necessity for empirical research in this area, and introduces the sub-aims of this Behaviours study. Section 3.2 outlines the methodology of this Behaviours study, including the data selection process (section 3.2.1) and the method of analysis (3.2.2). The results and discussion are presented in section 3.3, which considers the status of Behaviours as their own verbal category. In this section, section 3.3.1 firstly presents the Corpus Pattern Analysis results, whilst section 3.3.2 provides the results and discussion of the lexico-grammatical features of Behaviours. Section 3.4 then goes on to discuss the nature of Behaviours in terms of verb polysemy and prototypicality of the category. Finally, section 3.5 concludes this Behaviours study and motivates the Intransitive Action (IA) study, which is presented in Chapter 4.

3.1 Behaviour ambiguities

Whilst many approaches concern the classification of verb processes, few pay attention to Behaviours specifically (besides Systemic Functional Linguistics (SFL)), though Behavioural verbs are included in many classifications (West 1953; Palmer 1974; Levin 1993; Francis et al. 1996). It is widely noted that there are borderline cases to categorisation within linguistics (Palmer 1974; Halliday and Matthiessen 1999; Taylor 2003) and scholars tend to use different labels when referring to this notion. For example the terms 'fuzzy edges' or 'fuzziness' tend to be used in cognitive and lexical semantics (Declerck et al. 2006, p.69; Langacker 2008, p.138; Geeraerts 2010, p.183; Löbner 2013), whilst SFL linguists typically refer to the notion of 'indeterminacy' (Halliday and Matthiessen 2006; Gwilliams and Fontaine 2015). Borderline cases and ambiguities can occur when categorising verbs, verbal processes or verbal constructions, and this is especially true for Behaviours, as this section will detail. Certain aspects of Behaviour criteria are particularly unclear or restricted, including volition and use with reported speech (see section 1.3.1) and for these reasons were not included in the Behaviours definition.

Volition is a clear example of potential ambiguities in the categorisation of Behaviours (Banks 2015, pp.23–25). A voluntary process is defined as a process that is "under the control of the person that experiences them" (Levin 1993, p.218). Hopper and Thompson (1980, p.252) regard all low transitivity constructions as non-volitional; as Behaviours are intransitive, they are non-volitional according to Hopper and Thompson's criteria. However, much research categorises certain Behavioural verbs as volitional and others as non-volitional (Tenny 1987, pp.261–263; Levin 1993; 1995, p.91). For example, Levin (1993) regards 'talk' or 'chitchat' verbs (which typically include Behavioural verbs) as voluntary and 'hiccup verbs' or 'verbs of body-internal states of existence' as involuntary. Within the theory of SFL, Downing and Locke (2006, p.152) consider behavioural processes (representative of Behaviours, as established in section 1.2) as "typically involuntary", yet go on to state "it may be that there is a slight agency involved". They also show how adjuncts of manner imply volition, such as *he coughed discretely* (Downing and Locke 2006, p.152). This is "bordering on a contradiction" (Banks 2015, p.24) within the same literature let alone across literature. Other researchers regard behavioural processes as the voluntary counterparts of mental experiences. For example, the Behaviours of *looking* and *listening* are the voluntary counterparts of *seeing* and *hearing* (Eggins 2004, p.250; Thompson 2004, p.103; Banks 2015, p.24). Thompson (2004, p.103)

even argues that this difference in behavioural and mental experiences is "one of the main reasons" for setting up the behavioural process category in SFL.

There are even divergences in determining the volition of specific Behavioural experiences. For example, *laughing* is outlined as both a voluntary (Perlmutter 1978, p.162; Smith 1978a, p.107; Kuno and Takami 2004, p.9; Banks 2015, p.24) and involuntary reaction (Francis et al. 1996, p.11; Tawa 2009, p.373; van Gelderen 2019, p.220), however, this literature does not provide reasons or justifications for their descriptions. Verbs can often represent both voluntary and involuntary experiences (Perlmutter 1978, p.162), depending on the context it is in (Dixon 1998, p.53), and therefore labelling a single verb as either volitional or non-volitional without reference to a particular context is problematic. For example, *laughing* is sometimes involuntary and other times controlled (Keltner and Bonanno 1997; Dixon 1998; Ruch and Ekman 2001; Gervais and Wilson 2005), which usually depends on the semantic nature of the subject (Dixon 1998, p.53). Similarly, although *coughing* is often regarded as involuntary (Tenny 1987, pp.261–263; Sorace 2000, p.877), it is also possible to control the urge to cough (Banks 2015, p.24) and people can cough with volition (Tenny 1987, pp.261–263; Sorace 2000, p.877; Downing and Locke 2006, p.152).

Future research considering the volition of Behaviours could determine whether this is an additional inherent characteristic of the verbal category, in order to address the current divergences of literature on this matter. For example, a participant role analysis or adjunct tests (e.g., adding *on purpose* or *accidentally*) could be applied to a dataset of Behaviours, obtained from a corpus, to empirically establish the typicality of voluntary vs. involuntary instances. This investigation however would likely require a detailed analysis and is not in the scope of this thesis. The following sections will now introduce ambiguities of Behaviours in several areas of research. Section 3.1.1 will firstly address the potential indeterminacy of Behaviours within SFL, followed by ambiguities within Construction Grammar (section 3.1.2) and then Levin's verb classes (section 3.1.3).

3.1.1   Ambiguities in the behavioural process within Systemic Functional Linguistics

As described in Chapter 2, Halliday's (1994) theory of Systemic Functional Linguistics (SFL) represents experiences through six process types: material, mental, relational, verbal, existential and behavioural. Halliday (1994, p.106) argues that each process type is distinguishable by its own distinct lexico-grammatical features. Many clausal configurations

fit neatly into these process type categories in SFL analysis, however, as Thompson states, process type criteria "are often difficult to apply, or give ambiguous results" (2015, p.29). Ambiguity in process type classification is especially true for the behavioural process, as it has "no clearly defined characteristics" (Halliday 1994, p.139) and the lexico-grammatical features are not as clear as the other process types.

The ambiguity in defining characteristics of the behavioural process is typically caused by 'indeterminacy', that is, the lack of determinate boundaries in language systems and language categories (Halliday and Matthiessen 1999, p.547). The indeterminacy subtype 'overlap', which concerns two groups that share similar features (Halliday and Matthiessen 1999, pp.549–551), applies to behavioural processes as they are "partly like the material and partly like the mental" (Halliday 1994, p.139). In particular, the theory lacks reliable lexico-grammatical features to distinguish behavioural processes from material processes that are intransitive, i.e., neither take a *that*-complement, they both favour the progressive aspect in present tense, and behaviourals are typically intransitive. Semantically, the first participant (Behaver) is similar to the Senser in mental processes as they both have consciousness (Halliday and Matthiessen 1999, p.136). The process itself is arguably most similar to a material process as they typically involve physicality compared to the internal experiences of mental processes. Despite Halliday situating behavioural processes between material and mental ones, some are also similar to verbal processes (Martin and Matthiessen 1992, p.364; O'Donnell et al. 2009; Bartley 2017, p.109) as they can portray communicative experiences by reporting speech. In these instances, the Behaver has the same participant role of a Sayer in a verbal process, which is "the originator …of saying" (Halliday and Matthiessen 1999, p.151), however they are used metaphorically and only in restricted ways (see sections 1.3.1 and 2.2.1). For example *"kiss me" she breathed* cannot be alternated to **she breathed "kiss me"* and someone cannot literally breathe words (Bartley 2017, p.61). This has led some researchers to reconsider these behavioural instances as a sub-type of verbal processes (Banks 2015; Bartley 2017). Thus, the lack of clearly defined characteristics and indeterminate nature of the behavioural process leads to overlaps with other process types.

These overlaps of process types lead to inconsistencies in process type analysis, as shown in empirical research (O'Donnell et al. 2009; Gwilliams and Fontaine 2015). One study by O'Donnell et al. (2009) aimed to advance understanding of how individuals classify process types and the difficulties that arise when doing so. For their research, 68 SFL users identified

the process types of 32 clauses. The overall findings revealed discrepancies in the classification of every clause that was given, as well as a divide between coders who classify based on semantics and those who classify based on syntax. Specific to the behavioural process, O'Donnell et al. (2009, p.4) found discrepancies in the coding of the processes involving the verb *talk*, and the grammatical construction was shown to have an effect. The first clause that caused discrepancies in behavioural process analysis is shown in example (106).

(106) We talked for hours (O'Donnell et al. 2009, p.3)

For the analysis of the clause in example (106), 59% of coders analysed it as behavioural, 32% as verbal, and 6% as material. Those who coded a verbal process appeared to rely on the semantics of the communicative act. The behavioural coders tended to acknowledge grammatical criteria, in particular the fact that there was no 'projection' – as shown in section 2.2.1, verbal processes are able to project another clause, such as a *that*-complement, whereas behavioural processes cannot. Two of the four coders who selected material stated that they converge the behavioural and material process in analysis i.e., "behaviourals are not part of their process type model" (O'Donnell et al. 2009, p.3). Discrepancies in behavioural coding also occurred with the analysis of the clause in example (107).

(107) The talented junior sat down with Samantha Kilgore *and talked about his hometown of Motown* (O'Donnell et al. 2009, p.4)

In example (107), 53% of coders analysed the second (italicised) clause as a verbal process, 40% as a behavioural process, and 7% as a material process. O'Donnell et al. (2009, p.4) suggest that the decrease of behavioural coders of example (107) compared to (106) is because the prepositional phrase *about his hometown* implies a cline towards a projection of the speech. This prepositional phrase is a circumstance of matter, which Matthiessen (2015, p.28) describes as "manifestations of projection" (see section 2.2.1 for more detail on circumstantial elements). O'Donnell et al.'s (2009) study reveals ambiguities in categorising behavioural processes in SFL and emphasises the mismatch of syntactic and semantic coding. Although Halliday (1994, p.106) claims that our experiences should be distinguishable in the grammar of the clause, the lack of clear behavioural features means that they "are largely identified on semantic grounds" (Thompson 2014, p.109).

One problem within SFL is that explanations tend to be based on prototypical cases (Tucker 2014, p.402) and so indeterminacies arise when applying process classification to "real-world

practice" (Gwilliams and Fontaine 2015, p.7). Halliday and Matthiessen (1999, p.457) believe that indeterminacy "is something that should be built in to our ways of representing and interpreting language: part of the background, rather than the foreground, to our account of the construal of experience." However, discrepancies in process type analysis are problematic for the theory and its applications to wider research (Gwilliams and Fontaine 2015, p.3). Clearer criteria would increase consistency across SFL analysts and the validity of future research, which in part has motivated the exploration of Behaviours in this chapter.

The lack of clearly defined characteristics has led to some SFL accounts and users excluding the behavioural process altogether (cf Fawcett 2000; Neale 2002; Banks 2015; Bartley 2017). In the Cardiff model of SFL, proposed by Fawcett (cf Fawcett 2000), there is no behavioural process. These experiences are modelled under 'one-role affected-only Action' processes (material is re-named to Action in Cardiff Grammar) or 'agentive perception mental' processes. Similarly, Banks (2015) proposes a system network that omits the behavioural processes, and distributes them into subtypes of material, mental and verbal processes, such as 'non-projecting verbal process' or 'involuntary perception mental process'. Matthiessen (1995, p.251) places behavioural processes as a sub-category of material processes and outlines them in regard to two groups; 'intro-active' and 'inter-active' behaviours. However, the diversity of the material process already causes difficulties in analysis (Thompson 2014), before considering these extensions outlined above. Combining intransitive behavioural processes with transitive verbal or mental processes is questionable considering the inherently different grammatical nature (for example its inability to take a *that*-complement or typical present progressive aspect). This dilemma of the positioning of behavioural processes will be returned to in section 4.6. Gwilliams and Fontaine (2015, p.3) point out that indeterminacies still exist regardless of the "different varieties of SFL", and each approach must address the challenges that arise. For now, the focus remains on behavioural processes within the Hallidayan Grammar, or 'Behaviours' as I have referred to them. This ambiguous nature of Behaviours is not restricted to SFL, but also occurs across different theories. Sections 3.1.2 and 3.1.3 address these ambiguities, first within Cognitive Grammar, followed by verbal classification in Levin's (1993) Verb Classes and Alternations.

3.1.2 Ambiguities in Behavioural verbs within Cognitive Grammar

The categorisation of verb perfectivity in Cognitive Grammar reveals fuzzy boundaries of Behavioural verbs. Langacker's perfectivity verb class is just one of many perspectives of perfectivity (cf Brinton 1988; Smith 1991b; Givón 1993; Langacker 1995; Declerck et al. 2006; Van Rompaey 2013) and differs from the grammatical aspect classification outlined in Chapter 2 (though there are parallels between the two). According to Langacker's (2008, p.147) classification, the two main classes of verbs are perfective and imperfective.

Perfectives are bounded in time and convey a change from a beginning to an end, such as *fall, jump, kick, bite, persuade, learn* and *cook.* Imperfectives are not specifically bounded in time and convey a continued event, such as *be, have, know, believe, love, hope,* and *exist*. In other words, they have an "indefinite duration" (Langacker 2008, p.148). Langacker (2008, p.148) presents the contrast of perfective/imperfective verbs using the difference between the verbs *learn* and *know*; *learning* something involves a change at a point in time, but *knowing* is an on-going state without an endpoint. Whilst this is a predominantly semantic classification of verb types, there are grammatical distinctions such as tense and aspect. Differences are highlighted between the simple present tense and the progressive aspect (marked by the verb *be + –ing*) (ibid, p.155). Perfective verbs take the progressive over the simple present form (see example (108)), whereas imperfective verbs occur in the simple present tense (see example (109)).

> (108) a) *He learns the poem (Langacker 2008, p.148)
>   b) He is learning the poem (ibid)
> (109) a) He knows the poem (Langacker 2008, p.148)
>   b) *He is knowing the poem (ibid)

However, there are also numerous verbs that semantically denote stable situations and grammatically occur in the progressive as opposed to the simple present form. These verbs refer to an event that occurs in that exact moment, and semantically denote imperfectives but grammatically function as perfectives (see example (110)). These instances typically represent Behaviours.

> (110) a) *She {sleeps/swims/dreams/perspires/meditates} (Langacker 2008, p.148)
>   b) She is {sleeping/swimming/dreaming/perspiring/meditating} (ibid)

However, I take issue with Langacker's notion of 'stable situation' to refer to certain experiences such as *swimming* (as outlined in (110)). Langacker (2008, p.148) states that the process of *swimming* "is homogeneous in the sense that any stretch of swimming is comparable

to any other, with repetitive movement of arms and legs resulting in steady progress through the water." Though, I believe that the active experience of *swimming* is more similar to the actions of perfectives, such as *learning* or *jumping*, as opposed to the stative situations of imperfectives, such as *knowing* or *loving*. This is highlighted by literature that classes *swimming* as a manner of motion verb (Levin 1993, p.266; Sorace 2000) or physical action process (Thompson 2014, p.112).

Examples such as those in (110) demonstrate the overlap in categorising Behavioural verbs as perfective and imperfective, where their grammatical form tends to reflect the grammar of perfective verbs, whilst there semantics is arguably closer to the semantics of imperfective verbs. Langacker (2008, p.148) recognises the inevitability of indeterminacy in verbal classification and states that categorising verbs as perfective and imperfective "is anything but a rigid lexical specification". He acknowledges that many verbs are used in both ways; a primarily perfective verb (see example (111)) becomes imperfective in certain situations (see example (112)). In example (111), the perfective verb *surrounded* represents a bounded event. In example (112), *surrounds* is an imperfective verb representing a continuous, stable situation. Langacker (2008, p.149) labels this "flexible categorization".

(111) The SWAT team surrounded the house (Langacker 2008, p.148)
(112) A hedge surrounds the house (Langacker 2008, p.148)

Nonetheless, the fuzzy boundaries in (im)perfectivity highlighted above are representative of Behavioural verbs, highlighting their indeterminate nature. The following section acknowledges crossovers of Behavioural verbs in another verb classification, by Levin (1993).

3.1.3 Ambiguities in Behavioural verbs within Levin's (1993) Verb Classes and Alternations

Cross-over in Behavioural verb categorisation is found in Levin's (1993) verb classes and alternations. We saw in Chapter 2 that Behavioural verbs are listed under several verb classes and can occur in several alternations. For example, the 'cognate object' construction hosts several Behavioural verbs, such as *giggle* and *sneeze* under the subclass 'verbs of non-verbal expression' and *breathe* under the subclass 'breathe verbs'. A single Behavioural verb is also found in multiple alternations. For example, *cry* functions in five different constructions, including 'dative', 'locative', and 'reaction object' alternation. This variation is expected as

verbs are "argument-taking elements" (Levin 1993, p.2) which often function in different clausal configurations. However, as we saw in Chapter 2, an issue with Levin's classification is that some Behavioural verbs are not listed under the alternation it can occur in, despite being included in her verb classes. As Kuno and Takami (2004, p.106) point out, involuntary bodily processes such as *belch, vomit, cough* and *hiccup* are typical of the cognate object construction. Whilst Levin includes all of these verbs in her research, only *cough* is outlined under the cognate object alternation (Levin 1993, p.95). The exclusion of the other bodily process verbs suggests that her verb classification falls short in accounting for a comprehensive profile of the verb. As we saw in Chapter 2, the reason for these exclusions of certain verbs is because it is the classes of verbs that are included rather than individual verbs – if only some, but not all, verbs from a verb class fit the cognate object construction, then they weren't included under this alternation. This highlights the problems that can arise in verb classification and with Behavioural verbs more specifically, as some verbs are omitted owing to the classification method used.

Behavioural verbs exist in various verb classes and several are repeated in different classes. For example, *shake* is included within 'verbs of existence', 'verbs involving the body', 'verbs of psychological state' and 'verbs of combining and attaching'. Whilst the verbs tend to adhere to the verb class criteria, in some cases Levin notes exceptions within verb classes. One example is in the class 'peer verbs', which are a subset of 'verbs of perception' (ibid, p.187). These are used intransitively and take prepositional phrase complements, and every verb involves sight except for two; *sniff* and *listen. Listen* also differs in its grammar – whereas most verbs take the preposition *at* as the head of the prepositional phrase, *listen* takes the preposition *to* E.g., *We listened to them playing.* This is rather surprising seeing as the difference between some verb classes relies on the prepositional head, for example 'chitchat verbs' are differentiated from 'talk verbs' by the fact they cannot take a *to* phrase. Levin (1993, p.208) even highlights that a closer examination of the 'talk verbs' could reveal differences between verbs within this group, although interestingly there are only two verbs are included in the talk group (*talk* and *speak*). The exception of some Behaviour verbs within semantic classes indicates the fuzzy boundaries or borderline cases that arise in their classification. Levin's work highlights that Behaviours cannot be classified by the verb alone, given that a particular verb appears in multiple categories.

3.1.4   Summarising the indeterminacy of Behaviours and motivating this study

This section has explored the classification of Behaviours and where some ambiguities lie in the categorization process. From this review, we can gather that Behaviours are an indeterminate category, which stems in particular from a divergence in the syntax and semantics. Based on SFL literature, their lexico-grammatical features do not clearly distinguish them from other categories of experiences; grammatically, Behaviours have the same features as action processes, but they are also semantically similar to mental and verbal experiences. However, the research reviewed in this section is not based on empirical evidence, and so we cannot be entirely confident about the typical features of Behaviours, such as whether they are typically intransitive, or grammatically progressive.

Thus, using corpus data, this Behaviours study aims to empirically evaluate the extent to which intransitive behavioural verbs exhibit sufficiently similar semantic and lexico-grammatical features which justify the Behavioural categorization. This aim is dealt with in two parts:

1.1.   To use empirical evidence to identify a reliable set of lexico-grammatical descriptors of Behavioural verbs.
1.2.   To determine the extent to which Behaviours can be empirically established as a category.

The following section outlines the methods that were carried out to achieve these sub-aims, and the overall aim of this Behaviours study.

3.2 Methodology of the Behaviours study

This section presents the methodology of this Behaviours study. Section 3.2.1 outlines the data collection process, and looks at including the selected corpus, how the data was obtained from the corpus, and exclusions that were made to the dataset. The data analysis is described and motivated in section 3.2.2, which uses several approaches to investigate five main lexico-grammatical features of Behaviours: Behaver animacy, (in)transitivity and *that*-complements in section 3.2.2.1 and grammatical aspect and lexical aspect in 3.2.2.2.

3.2.1 Data Collection of Behaviours

The first step of this empirical analysis was compiling a dataset of Behaviours using corpus data. Whilst linguists have often been selective and based examples on intuition when supporting theoretical claims (Granger 2003, p.18; Hanks 2009, p.64; Dąbrowska 2016b, p.484), obtaining authentic data using corpus linguistics reduces this researcher bias (Koller and Mautner 2004, p.218). As McEnery and Gabrielatos (2006, p.34) point out, "corpus linguistics is empirical, in that it examines, and draws conclusions from, attested language use, rather than intuitions".

3.2.1.1 *Corpus Selection*

The Corpus of Contemporary American English (COCA) was the chosen data-collection source for this study for several reasons. It comprises 560 million words of data up to 2017, with a wide range of text genres (Davies 2008-). Therefore, the COCA is representative of current verb use, which increases the reliability of the data (Neale 2002, p.195). The large corpus size was also required considering the estimated low frequency of Behaviours (see section 2.2.2) and intransitive verbs more generally (see section 5.1). Another advantage is that the COCA has been filtered for incomprehensible or ungrammatical instances, making it user friendly and the analysis time efficient (compared to the enTenTen13 for example, which included a considerable amount of these instances (Chrispin 2017, p.38)).

3.2.1.2 *Behaviours Verb selection and corpus search*

To obtain a dataset of Behaviours, verbs that are typically presented as examples of Behaviours or in Behavioural constructions in the literature were identified and used in a corpus search. A list of Behavioural verbs was compiled according to the criteria provided in the definition of Behaviours in this thesis (see section 1.3). It was the intention to capture the most typical Behavioural verbs to gain a clear sense of their typical features. Verb choices were supported using Banks' (2015, pp.27–34) review of "potential behavioural verbs", which outlines the examples of behavioural processes used across eight SFL books.

Drawing on behavioural process descriptions from Halliday (1994, p.139), Halliday and Matthiessen (1999) and Banks (2015), five semantic categories of typical Behaviours[17] were determined: 'Psychological Perception', 'Psychological Cognition', 'Communicative', 'Physiological Emotion' and 'Other Physiological'. Psychological Perception Behaviours represent conscious processes of perception or observation and include experiences such as *listening* and *looking*. These are similar to mental experiences, such as *hearing* and *seeing*, but differ in that they represent more physical manifestations. Psychological Cognition Behaviours can be defined as cognitive processes represented as forms of behaviour and include experiences such as *dreaming* and *ruminating*. Communication Behaviours represent communicative acts, such as *talking*, *mumbling* and *gossiping*. Finally, Physiological Behaviours concern physical functions, and tend to represent bodily reactions to the environment. Specifically, Physiological Emotion Behaviours refer to bodily functions that represent emotions and include experiences such as *sobbing* (typically expressing sadness) and *grinning* (typically expressing happiness or pleasure). Other Physiological Behaviours represent involuntary bodily functions, which are not necessarily linked to emotions, and include experiences such as *coughing*, *hiccupping* and *blinking*.

Each verb from the list of Behavioural verbs was classified as one of the five semantic categories, using SFL literature and Levin's (1993) verb classes. Three verbs were obtained at random from each semantic category to provide an equal spread of semantic meanings in the data, providing 15 verbs in total (see Table 3-1). The randomisation process involved numbering each verb and using a random number generator to select them. The psychological perception verbs were *look, stare* and *listen*, the psychological cognition verbs were *ponder, ruminate* and *meditate*, the physiological emotion behaviours were *frown, laugh* and *cry*, the other physiological behaviours were *hiccup, shiver* and *sneeze,* and the communication verbs were *talk*, *converse* and *gossip*.

Table 3-1: Fifteen verbs representing Behaviours

Psychological		Communicative	Physiological	
Perception	Cognition		Emotion	Other
Look	Ponder	Talk	Frown	Hiccup
Stare	Ruminate	Converse	Laugh	Shiver
Listen	Meditate	Gossip	Cry	Sneeze

[17] Halliday does also have a 'near material' (process) category, although considering how similar they are to material processes, and could be defined as material by some, these have not been included as typical Behavioural processes (see Chapter 4).

The Key Word In Context (KWIC) search query function in the COCA was used for each verb search. The search formula entered for each verb was 'VERB_v', for example, 'CRY_v' for the verb *cry*. Capitalising the word creates a lemma search, meaning that all inflections of the word are returned. Behaviours are regarded as typically occurring with the *-ing* form and so all forms of the lexeme were analysed to determine if this was the case. Adding '_v' to the query ensures only verbs are returned. The clause of each Behavioural verb is displayed in a concordance line. A random sample of 30 concordance lines was obtained for each target verb form. Sinclair (2003, pp.xiii–xiv) suggests an exploratory procedure in which a preliminary sample of around 25 instances is inspected and analysed, repeating the process with successive samples until the analyser is "satisfied that most of the main patterns are evidenced in sufficient quantity". Whilst Sinclair proposes successive examinations, as this Behaviours study acts as a preliminary and exploratory study of Behaviours, the initial sample of 30 concordance lines for each target verb form was explored (see Chapter 4 for a more in-depth investigation with larger samples per verb). The semantic grouping of the verbs created larger samples, amounting to 90 instances of each semantic category and a total of 450 instances of Behaviours, enabling a richer understanding of the category more generally.

3.2.1.3   *Exclusions of the Behaviours dataset*

In line with Baker's (2006, p.92) recommendation to "clean" the data, several concordance lines were excluded and replaced (still at random). These exclusions were made to a larger sample (50 concordances per target verb) that was obtained from the corpus in a pilot stage, which was used to develop the final sample of 30 instances per target verb, to uphold the representativeness of the sample. Non-finite clauses were excluded because they lack tense, modality or mood (Fontaine 2013, p.117), as shown in example (113). Only instances in which the search verb was the main verb were selected, excluding verbs like catenative verbs – verbs that create 'chains' of verbs (Huddleston and Pullum 2002, pp.1225–1228) – such as to-infinitivals (see example (114)) and gerund-participial complements (see example (115)). Non-finites were the most frequent exclusions, appearing in around 24% of the dataset.

(113) In talking to skaters, I was aghast to learn that judges routinely hang around practice rinks (COCA MAG: Ms)
(114) I began to shiver again (COCA FIC: BkSFAmericanHistory)
(115) I started crying (COCA NEWS: Chicago)

Further exclusions included tagging errors of adverbials[18] as the nodes rather than verbs (see example (116)). Although the 'part-of-speech' function was set to verbs in the KWIC search, it is not always accurate and tagging errors occur. This error occurred in around 7% of the dataset.

(116) "Isn't it locked" Will asked, *frowning* (COCA FIC: Cloud Nine)

Another error tagged nouns as the node (in around 5% of the dataset) and was most common with proper nouns (see example (117)). In the verb search for *gossip,* the concordance line in example (117) returned *Gossip Wars* as the proper noun to a new television show. A similar error also occurred with adjectives (see example (118)) in around 1.5% of the dataset.

(117) *Gossip Wars* coming up soon on showbiz tonight (COCA SPOK: CNN_Showbiz)
(118) Her…staring eyes (COCA FIC: NewEnglandRev)

Concordances of quoting speech were also omitted as these did not fit the criteria of a Behaviour (see section 1.3.1). As a reminder, these are regarded as metaphoric for verbal experiences as opposed to Behaviours, where the manner of speaking is substituted for the literal speech process (Bartley 2017, p.61). The order for these is fixed, with the structure *[quote] V* (see example (119)) as opposed to *V [quote]* (see example (120)), and therefore they were excluded as reporting. Some verbs used in the corpus search are not used in this quoting way, such as *listen, stare, sneeze* and *look,* and so it is not plausible to use this quotative criteria as an exception for some behaviours but not others.

(119) "wolves?" Paul shivered (COCA FIC: Analog Science Fiction & Fact)
(120) *Paul shivered "wolves?"

Finally, a frequent exclusion with the experience of *looking* was in the context of describing something's appearance or what it "seems to be" (Francis et al. 1996, p.15). In the COBUILD these are classed in the 'seem group' of verbs, which are a sub-type of 'link verbs' and take the patterns *V n*, *V prep* or *V like n* (Francis et al. 1996, pp.450–452). Levin (1993, p.188) classes these as 'stimulus subject perception verbs' where the perceiver is not the subject but rather the stimulus is. These instances were excluded because they do not represent the perceptive Behaviour but rather attribute features to entities (see example (121)). After removing and replacing these exclusions, the data was analysed.

---

[18] A follow-up investigation of how Behaviours are used as manner adverbials would be interesting, though is not in the scope of this research.

(121) The place *looked* more like an old plantation house (COCA FIC: The Fireman's Fair)

3.2.2   Data Analysis of Behaviours dataset

As stated above, the data was analysed for five main lexico-grammatical features: Behaver animacy, intransitivity, (lack of) occurrence with *that*-complements, grammatical aspect and lexical aspect. Motivations for investigating these five lexico-grammatical features are as follows. According to literature, Behaver animacy, intransitivity and a lack of occurrence with *that*-complements are three lexico-grammatical features of Behaviours (see section 1.3). Investigating these categories using corpus data will empirically establish whether they are features of this category. Grammatical aspect was selected in order to empirically investigate claims that progressive aspect in present tense is a typical feature of Behaviours. Grammatical aspect was selected over a simple analysis of the progressive form because it is regarded as "an extra layer of aspectual meaning which is added by particular contextual features" (Heyvaert et al. 2019, p.37) and gives a more fine-grained analysis between progressive and non-progressive forms, which Bache (2008, p.39) highlights is needed in analysing English. Lexical aspect was chosen as a feature because it has potential to offer a new perspective of Behaviours and in particular sheds light on the nature of the category's temporal meaning. Section 2.4.9 outlined current links between potential Behaviour verbs and lexical aspect (Tenny 1987, pp.17–20; Dowty 1991; Levin and Rappaport Hovav 1996, p.137; Halliday and Matthiessen 1999, p.471; van Gelderen 2018, p.10), and whilst this is an interesting starting point, the direct link between lexical aspect and Behaviours is not empirically established.

To investigate these features, several separate analyses were carried out on the data. Hanks' (2004a) Corpus Pattern Analysis (see section 3.2.2.1) identified the three features animacy, (in)transitivity, and *that*-complements, and revealed fine-grained verb senses of Behaviours that contributed to our overall understanding of this verb category. A tense and aspectual analysis (in accordance with Vendler 1957; Smith 1991; Declerck et al. 2006) identified the grammatical and lexical aspectual features of Behaviours (see section 3.2.2.2). A score was devised for each verb to determine how representative or 'prototypical' the verbs were of the Behaviour category, according to the five typical lexico-grammatical features that are revealed in section 3.3.2. The most typical features were: Behaver animacy, intransitivity, lack of *that*-complements, activity or semelfactive lexical aspect and perfective grammatical aspect. A score was given for each feature of each verb, to calculate an overall mean – the closer the

score to 1 is, the more prototypical of the Behaviour group. We shall return to this in the discussion (see section 3.4).

The manual analysis process was carried out using Microsoft Excel, as this programme allows each type of analysis to be clearly displayed in separate columns. The date, genre and domain were automatically inputted from the corpus data, alongside the concordance lines. An additional column was created for notes. This data analysis is presented in appendix one, which shall be referenced from here out to support the explanations of data analysis (in section 3.2.2) as well as the results (in section 3.3). Each analysis process will be outlined below with justification as to why it was chosen.

3.2.2.1 *Hanks' (2004) Corpus Pattern Analysis*

As stated above, the analysis used to identify three lexico-grammatical features of Behaviours (animacy, intransitivity, and *that*-complements) was Hanks' (2004a) Corpus Pattern Analysis (CPA). This section firstly introduces CPA and describe the work it is grounded in, then provides justifications for selecting CPA, before finally outlining the CPA process used in this study.

To very briefly summarise (see below for detail), CPA identifies typical word uses by obtaining concordance lines of a target word, analysing their patterns and assigning each pattern a meaning. CPA is based on Hanks' Theory of Norms and Exploitations (TNE), which addresses how people use words to make meanings (Hanks 2009, p.64). Norms are defined as patterns of the conventional uses of language (Hanks 2013, p.91), where a pattern consists of "a valency structure, together with a set of preferred collocations" (ibid, p.92). An exploitation is defined as a "deliberate departure from an established pattern of normal word use" (ibid, p.212). Thus, exploitations are unusual and creative uses, and include: anomalous arguments i.e., unexpected members of lexical sets; figurative uses i.e., non-conventional metaphors; and unusual syntax. TNE is viewed on a cline, with norms at one end, exploitations at the other, and alternations in the middle (Hanks 2009, p.66). Alternations include: lexical alternations, which substitute one word without changing meaning (*grasping* vs *clutching at straws*); syntactic alternations, as described in Levin (1993) (see section 2.3); and semantic-type alternations, which refer to the same event with a different focus (*calming someone* vs *calming someone's anxiety*). The alternative focus does not have a great influence on the meaning, like exploitations do.

Frequencies of use are central to this theory, where norms are identified through "repeated use" and exploitations show "abnormality, aberration, eccentricity or other departure from the norm" (Hanks 2013, p.147). Distinguishing between exploitations and alternations is also largely based on frequency (ibid, p.216).

CPA is applicable to a variety of word classes, including verbs, nouns (Hanks 2004a, p.92) or prepositions (Litkowski 2014), but the procedure outlined below focusses on the analysis of verbs for the obvious reason that they are central to this research. Hanks (2013, p.66) argues that a verb in isolation has a "meaning potential" which is developed through their grammatical patterning. Meaning potential can be explained using the verb *blow,* which has several associations of meanings: the action of the wind; the action of a fist; doing something really badly; the feeling of disappointment; something you do to a nose; or to a balloon; or to a fuse; etc (Hanks 2010, p.2). Emphasis in this analysis is therefore on the usage of the verb as opposed to the verb in isolation.

There are several justifications for why CPA was identified as an appropriate analysis in this Behaviours study. The use of a corpus in the analysis provides empirical validity with authentic data (Tognini-Bonelli 2001, p.2), which is required in this Behaviours study to investigate the theoretical claims that have been made in the literature about Behavioural features. As Hanks (2009, p.63) argues, although it is very common practice, basing theory on intuitions is "a very poor source of evidence". The method in CPA allows the analyst to identify typical uses of language based on frequency, which can be used to determine the description of the category of Behaviours. Additionally, to the best of my knowledge, there are no computer-assisted tools that would reveal reveals fine-grained senses of different verbs and detail the lexico-grammatical nature of verbs, to the extent that CPA does.

It has been suggested that CPA falls short of accounting for the overall organisation of the lexicon, because it focuses on the individual word from a bottom-up approach (Viberg 2014, p.372). However, this shortcoming situates Hanks' work in relation to Cognitive Linguistics, rather than outlining a "serious criticism" (ibid). Additionally, models of overall organisation, such as Framenet (Fillmore and Baker 2010), have inadequacies for different reasons (Viberg 2014, p.372). Like CPA, Framenet takes a lexicographical approach in developing a database of word meaning, however it follows the theory of 'frame semantics' in which word meaning is understood by semantic frames. A Frame is defined as "a script-like conceptual structure that

describes a particular type of situation, object, or event along with its participants and props" (Ruppenhofer et al. 2016, p.7) and is supported by annotations from the BNC. Framenet differs from CPA which uses corpus data to identify the arguments of each word instance and build up patterns connected to implications based on frequencies. Whilst Framenet provides useful insights into the nature of certain words, one shortcoming is that it neglects prevalent meanings of a certain words (Rosca 2013; Hanks 2017), despite its aim of documenting "the range of semantic and syntactic combinatory possibilities —valences— of each word in each of its senses" (Ruppenhofer et al. 2016, p.7). For example, as Hanks (2017, p.8) points out, the verb *repair* only has the Self-Motion frame which does not refer to more typical meanings of repairing an artifact/bodypart, damage to an artifact or damage to a relationship – which accounts for 96% of *repair* uses according to the Pattern Dictionary of English Verbs (PDEV; 2014-). Additionally, there is no systematic criterion for distinguishing between normal and creative uses of language patterns in Framenet, meaning that metaphorical instances are often excluded, or, if included, their uses are not explained (Rosca 2013, pp.23–25). Contrary to this, Hanks' approach acknowledges variation in use through norms and exploitations.

Now the background of CPA has been established, we will turn to the analysis process used in this study. Firstly, a sample of concordance lines, or instances, was obtained for each of the 15 target verbs (see 3.2.1.2 for verb selection). Each verb's sample was then analysed consecutively. For each concordance line, the words that co-occur with the target verb were attributed a 'semantic type' – "a class to which a term can be assigned" (Hanks and Pustejovsky 2005, p.64) – which form the patterns. In doing CPA, linguists have a challenging task of deciding on the exact level of analysis (Hanks 2004a, p.88; Campo and Araque 2013, p.28) and this is also an issue for linguists more generally. For example, in Natural Language Processing applications a computer needs to distinguish between *firing a person* and *firing a gun* and even *firing a bullet* (Hanks and Pustejovsky 2005, p.68). This highlights another benefit of CPA; it extends the traditional view of Pattern Grammar (introduced in section 2.1.2), where Pattern Grammar focuses on word classes and function words in a pattern (Hunston and Francis 2000) and classifies the instances above as the pattern *V n* rather than making a distinction between each one (Hanks 2013, p.6).

Two levels of semantic types were analysed. The first was the general participant type which was analysed in terms of animacy, such as *[[animate participant]] V to [[inanimate*

participant]]. For example, in (122) *Karl* represents an animate participant and *the glob of grease* represents an inanimate participant.

(122) Karl stared at the glob of grease (appendix one, line 43)

What constitutes an animate participant is not always clear. For example, mythical participants such as *beasts* (appendix one, line 233) were analysed as animate participants because despite being fictional, they were represented as having consciousness. It is also unclear whether participants are animate in certain cases of metonymy (see example (123)) and meronymy (see example (124)). As shown in section 2.2.1, metonymy occurs when "one entity is used to refer to another entity that is associated with it in some way" (Hurford et al. 2007, p.339). In example (123), the first participant *the other professions* is used to refer to the professionals within these occupations.

(123) The other professions will not listen (appendix one, line 61)

Meronymy is typically used as a type of metonymy, and occurs when part of an entity is used to refer to that entity (Croft and Cruise 2012, p.159). In example (124), the subject *her brow* refers to the person frowning.

(124) Her brow frowns (appendix one, line 271)

In the analysis, these instances of metonymy and meronymy were analysed as animate; in their literal sense the objects were inanimate, but as some were referring to animate beings it was possible to analyse them in this way.

In line with Hanks' (2004a, p.93) guidelines, the second level of patterning concerned the semantic types of the animate or inanimate participants that had already been analysed, which revealed a deeper level of meaning and identified any differences that were not revealed solely using the participant types. For example, the pattern *[[animate participant]] looks at [[inanimate participant]]* was divided into separate patterns depending on the semantic types of the second participant. These were *[[human]] looks at [[physical object]]* with the implicature *human views or fixes their gaze on a physical object* and *[[human]] looks at [[eventuality]]* with the implicature *human thinks about an occurrence or event, usually mentioned or indicated* (see results section 3.3.1.1). A list of semantic types is provided by Hanks (2000-2014), which was used to form the patterns. If two or more arguments in a pattern

had the same semantic type, numbers were used to classify them (Hanks 2004a, p.93), such as *[[human_1]] talks to [[human_2]]*. When five or more semantic types occurred in a pattern, the semantic type was labelled *[[(in)animate participant]]* to prevent patterns becoming too long. The semantic type *[[anything]]* is provided in the ontology suggestions in CPA, however this semantic type was not used as it was too suggestive that absolutely any semantic type fits into this slot, which is unlikely to be the case for most verbs. Thus, *[[(in)animate participant]]* was chosen to describe the varying potential of semantic types that are both animate and inanimate, where *(in)* shows it was either animate or inanimate. Semantic types are displayed in double square brackets, and alternative semantic types are differentiated with a disjunctive bar (El Maarouf 2013, p.122), for example *[[animal / human]]*. Semantic roles were occasionally added to the semantic types, which are connected using an '=' sign. Semantic roles are context-specific roles that elaborate on the semantic type (Hanks and Pustejovsky 2005, p.64). For example, the pattern *[[human]] talks of [[(in)animate_participant = topic]]* is context specific to the discussion of a *topic* (see pattern 3 in section 3.3.1.3).

 Adjuncts were included in the patterns if they occurred in over 60% of instances. The CPA literature does not outline when exactly an adjunct should be outlined as part of the pattern, so this percentage was selected as it represents a reasonable majority in frequency. Optional arguments were displayed in round brackets or parentheses, e.g., *(adverbial)*. CPA adjunct labels were used, which included 'direction', 'location', 'manner', 'time point' and 'time period', such as *human stared (direction)* (see section 3.3.1.1). In situations where an adjunct label had not been outlined in CPA, Halliday and Matthiessen's (2014, pp.313–314) circumstantial adjunct labels were used. Whilst these circumstantial adjuncts are specific to experiential functions (see section 2.2), they provided enough detail for this analysis. These were analysed according to the criteria in Table 3-2 below, which is provided in Halliday and Matthiessen (2014, pp.313–314). The first column displays the adjunct types, which typically have sub-types, for example 'manner' adjuncts express the 'means' to which something occurred, 'quality' of how it occurred, a 'comparison' to another experience, or the 'degree' to which it occurred. The second column provides the 'wh-item' which can be used as a probe to identify adjuncts, for example asking *how?* is indicative of *manner: means* or *manner: quality*. The final column provides examples of realizations, for example adverbs of *-ly* indicate the quality of something. An example of a Behaviour with a *manner: quality* adjunct within the data is displayed in (125).

(125) The young man was listening attentively (appendix one, line 79)

Table 3-2: Halliday and Matthiessen (2014, pp.313-314)'s classification of adjuncts

Type		Wh- item	Examples of realization
Extent	Distance	How far?	for; throughout 'measured' nominal group
	Duration	How long?	for; throughout 'measured' nominal group
	Frequency	How many times?	'measured' nominal group
Location	Place	Where?	at, in, on, by, near; to, towards, into, onto, (away) from, out of, off; behind, in front of, above, below, under, alongside ... adverb of place: abroad, overseas, home, upstairs, downstairs, inside, outside; out, up, down, behind; left, right, straight ...; there, here
	Time	When?	at, in, on; to, until, till, towards, into, from, since, during, before, after adverb of time: today, yesterday, tomorrow; now, then
Manner	Means	How?	by, through, with, by means of, out of [+ material], from
	Quality	How?	in + a + quality (E.g., dignified) + manner/way, with + abstraction (E.g., dignity); according to adverbs in -ly, -wise; fast, well; together, jointly, separately, respectively
	Comparison	How? What like?	like, unlike; in + the manner of ... adverbs of comparison differently

Type		Wh- item	Examples of realization
Manner	Degree	How much?	to + a high/low/... degree/extent; adverbs of degree much, greatly, considerably, deeply [often collocationally linked to lexical verb, E.g., love + deeply, understand + completely]
Cause	Reason	Why?	because of, as a result of, thanks to, due to, for want of, for, of, out of, through
	Purpose	Why? What for?	for, for the purpose of, for the sake of, in the hope of
	Behalf	Who for?	for, for the sake of, in favour of, against ['not in favour of'], on behalf of
Contigency	Condition	Why?	in case of, in the event of
	Default		in default of, in the absence of, short of, without ['if it had not been for']
	Concession		despite, in spite of
Accompaniment	Comitative	Who/what with?	with; without
	Additive	And who/what else?	as well as, besides; instead of
Role	Guise	What as?	as, by way of, in the role/shape/guise/form of
	Product	What into?	into
Matter		What about?	about, concerning, on, of, with reference to, in ['with respect to']
Angle	Source		according to, in the words of
	Viewpoint		to, in the view/opinion of, from the standpoint of

In some cases, it was difficult to distinguish between adjuncts and complements within a pattern. As outlined in section 2.1, individuals confuse circumstantial roles with inherent participant roles (Fawcett 2009, pp.215–217) and this is a long-standing problem within linguistics (Somers 1984; Meyers et al. 1996; Dowty 2000). For example, it was difficult to establish whether the prepositional phrase in the pattern *human_1 talks with human_2* was a complement or an accompaniment adjunct. In line with Hanks' focus on "prototypical norms

of usage" (Hanks 2004b, p.6), frequencies were used to establish complements of patterns; if a preposition was high in frequency for a particular verb, then it was reasonable to predict that it is more closely related to that verbal process. The following criteria were also applied to support this analysis. Firstly, obligatory complements were recognised by a significant change in the verb meaning or ungrammatical use when the prepositional phrase was removed (Gonzálvez-García and Butler 2018, p.359), as illustrated in example (126).

> (126) a) Kittridge looks at his watch (appendix one, line 14)
>   b) *Kittridge looks

Secondly, complements and adjuncts were identified by their dependence on the main verb; main verbs determine certain complements but adjuncts are used more freely (Huddleston 1988, p.61; Gonzálvez-García and Butler 2018, p.359). For example, the prepositional phrase headed by *at* in example (127) is specific to the verb *shivered* in the dataset.

> (127) a) I shivered at the thought of severed chicken and pig souls… (appendix one, line 414)
>   b) *I looked at the thought of severed chicken and pig souls…

Adjuncts were also identified by their mobility and optionality in the clause (Quirk et al. 1985, pp.50–52), as exemplified with the locative adjunct *for a few moments* in example (128).

> (128) a) Lucian pondered for a few moments (appendix one, line 116)
>   b) For a few moments, Lucian pondered
>   c) Lucian pondered

A separate column was used to record the (in)transitivity of each instance. The criteria for intransitive clauses are outlined in detail in section 2.1 and summarised here for clarity. Intransitive clauses were most frequently recognised by simple one argument (subject and verb) structures, potentially with adjuncts. Transitive phrasal verbs were recognised by a (potential) direct object that could be situated between the phrasal verb units or after the phrasal verb (Aarts 2013, p.189). These instances have the transitive alternations *V+Particle+NP* and *V+NP+Particle* (see example (129)).

> (129) a) [machine]…looked up recipes online *(appendix one, line 1)*
>   b) [machine] looked recipes up

Clauses with *that*-complements were analysed as transitive constructions because they can be passivized (Francis et al. 1996, p.102), they are controlled by transitive verbs (Downing and Locke 2006, p.100), and *that* is used in the object function (ibid, p.449). The 'way' construction was also analysed as transitive because it takes a direct object noun phrase followed by a prepositional phrase (Israel 1996, p.218; Kuno and Takami 2004, p.67). As established in section 2.1.3, cognate object constructions are intransitive as the nominal form acts as an extension of the verb. Braces i.e., curly brackets, are used to either signify specific lexical items, or for phraseological groupings (Hanks 2004a, p.93), including clauses with *that*-complements (see Table 3-3). Similar to Pattern Grammar (Hunston and Francis 2000), patterns are always displayed in the active voice, even if the instance is in the passive alternation (El Maarouf 2013, p.134).

Table 3-3: Concordance Analysis of a Pattern with that-complement

Concordance (appendix one, line 245)	*They'd gossip that I don't earn enough money to provide for you*
Pattern	[[human]] V {that-clause}

The instances were then grouped and numbered depending on their patterns, and each pattern was given an 'implicature'. The term implicature originates from Grice (1968) and concerns the inferred meaning of an utterance that is not explicitly expressed. In CPA, implicatures represent the basic meanings of each pattern (Hanks 2004a, p.88). As an example, the first pattern of *meditate* is shown in Table 3-4.

Table 3-4: Pattern 1 Entry of the verb Meditate

Pattern	[[Human]] meditates
Implicature	[[Human]] focusses their minds on calm thoughts in order to achieve an altered state of consciousness
Concordance Example	*The Elder meditated for a long while* (appendix one, line 155)

The implicatures of each pattern, where applicable, were taken or adapted from the Pattern Dictionary of English Verbs (PDEV; 2014-). The PDEV is currently being developed using CPA and reveals the prototypical pattern uses associated with nearly 1500 verbs (so far). In circumstances where the PDEV could not be used, for example if it is yet to include one of the

verbs in this study, then verbs of similar meaning were used as a guide, and implicatures were developed with support from other sources. These other sources included the COBUILD (Francis et al. 1996) and Levin's (1993) verb classes as they are well established resources of verb meaning. If these sources lacked detail, the Oxford English Dictionary was used to support or develop implicatures (Oxford English Dictionary. 2021). Another means was using Construction Grammar to identify fixed constructions (Goldberg 1995), such as the 'way' construction which occurred in an instance of *ruminating*. Producing implicatures for metaphors proved more difficult. In these cases where it was not possible to use existing data sources, the implication was developed using collocational evidence. For example, the pattern *[[machine / vehicle]] V* was attributed the implicature *machine or vehicle breaks, usually moving with one or more sudden convulsive movements* through collocational evidence (see example (130)). Example (130) was one of six instances with the pattern. The collocational evidence "forward", "blurry", "stuttering" and "relentless stutter*"* indicated implications of breaking with sudden movements.

> (130) the film and soundtrack hiccup forward (appendix one, line 365; COCA FIC: Devil's corner)

Once every pattern was assigned an implicature, frequencies of each pattern in each verb were calculated and the CPA process was complete. Section 3.2.2.2 describes the other analyses carried out on the dataset.

3.2.2.2 *Tense and Aspect Analysis*

An analysis of mood, tense and aspect identified the remaining two features: grammatical and lexical aspect. This section will firstly detail the mood analysis, followed by tense analysis, grammatical aspect analysis and then lexical aspect analysis.

Mood choice concerns the role adopted by the speaker when communicating with a listener (Halliday 2002b, p.189). Mood structure is not usually included as a lexico-grammatical feature of Behaviours but was included to see if there were any tendencies towards one mood structure. In addition, mood plays an important role in identifying grammatical aspect. For example, the mood analysis identified imperative forms, which were excluded from the analysis of grammatical aspect (detailed below) since they have no tense (Depraetere and Reed 2006, pp.269–270) and so cannot denote the flow of an event. The three main mood structures analysed in this study were 'declarative', 'interrogative' and 'imperative', and were identified

by the interaction of the subject and finite operator which is part of the verbal group (Halliday 1994, pp.42-48;71-87). Declaratives typically express statements and were identified by the order of subject-finite (see example (131)). Interrogatives typically function to ask questions and were identified by the order finite-subject and *yes/no* or *wh-* questions (see example (132)). Imperatives function as commands and do not express the subject or are finite, but were identified by the main verb form only or because they started with *let's* (see example (133)).

    (131) He was frowning (appendix one, line 276)
    (132) Did he cry? (appendix one, line 346)
    (133) Let's listen to one (appendix one, line 77)

As well as mood, tense plays an important role in identifying grammatical aspect. It has been established above (and in section 1.3) that Behaviours are most typically in the progressive *-ing* form in present tense, according to literature. Thus, tense was recorded for each instance in terms of past and present. The literature on tense is vast and linguists refer to concepts in different ways, with varying levels of tense systems. In this thesis, tense is defined as relating the time being referred to to the time of orientation (Huddleston 1995; Declerck et al. 2006). The primary tense system contrasts past tense with present tense (Huddleston and Pullum 2005, p.44), where past tense locates the situation or event "prior to the present moment", whilst the situation or event coincides with the present moment in present tense (Comrie 1985, p.36). Tense is marked by the main verb or by the first auxiliary in a complex verb form (Declerck et al. 2006, pp.22–23). In this dataset, present tense Behaviours were recognised by the stem verb (no morphological attachment), an *-s* suffix when referring to the third person, or the auxiliary *is* in the verb phrase. Past tense was recognised by *-ed* suffix or the auxiliary *was* in the verb phrase. There is dispute over the future tense in English, with some scholars acknowledging a future tense in English (cf Halliday 1994; Declerck et al. 2006) and others not (cf Quirk et al. 1985; Huddleston and Pullum 2005, p.56). This debate is not central to this thesis, though instances with future time markings were acknowledged in the tense analysis as an expansion of the present tense system. Future time markings are represented in auxiliaries such as *will* and *shall*, and are regarded as belonging to the modal system as opposed to the tense system in English (Palmer 1974, p.144; Huddleston and Pullum 2005). As Huddleston and Pullum (2005b, p.31) put it, the present tense form is not "invariably used for referring to present time". Modal auxiliaries and adjuncts are used with the present tense to talk about the future time, for predictions of events that are yet to occur. The future markings were not considered as present

tense when identifying present progressive aspect, in line with Halliday's view of a future tense, because the claim about Behaviours is that they only occur in the progressive in the present tense (Halliday 1994, p.139).

Perfect tense, or aspect, is also much disputed in the literature, with some researchers positioning it in the tense system (McCoard 1978; Huddleston and Pullum 2002; Declerck et al. 2006; Velupillai 2012) but others in the aspect system (Comrie 1976; Leech 1987). It is regarded in the tense system in this thesis because it relates one reference point in time to another (Velupillai 2012, p.207) and "is not a question of different ways of representing the internal temporal constitution of a situation" (Declerck et al. 2006, p.38). Even Comrie, who regards the perfect as aspect, highlights how it is "rather different from other aspects" (Comrie 1976, p.52). For Huddleston and Pullum (2002, p.139), the perfect tense is dealt with in secondary tense system. Perfect tense is marked by *have + verb + past participle* (Huddleston and Pullum 2005) – an example of past perfect is shown in (134) and present perfect in (135). Any instances with perfect tense were recorded in the data analysis.

(134) but Yolanda had laughed (appendix one, line 308)
(135) we've been talking in this hour about fungus… (appendix one, line 200)

After the tense analysis, the dataset was analysed for aspect. As we saw in section 2.4.7, grammatical aspect concerns the expression of aspect by grammatical items (Declerck et al. 2006, p.28), and was analysed in terms of perfectivity, habituality and iterativity. Perfectivity concerns the boundedness of an event and refers to a situation in totality (Declerck et al. 2006, p.30), as in example (136), whilst imperfectivity concerns situations that have not reached a temporal boundary (Depraetere 1995, p.3), as in example (137).

(136) He talked to her about this job (appendix one, line 205)
(137) He was talking about the Gnalish (appendix one, line 187)

Imperfective situations are either stative and constant through time – simply labelled 'imperfective' – or they focus on a specific part of the situation, such as the beginning, middle or end – labelled 'imperfective ingressive', 'imperfective progressive', or 'imperfective egressive'. Instances in this dataset were either 'perfective' or 'imperfective progressive'.

Analysis of perfectivity was based on the literature outlined in section 2.4.7, which largely depended on context and how temporal meaning was construed in the grammatical items. Tests

were also applied to identify perfective clauses, such as compatibility with adverbs of repetitive construal (Langacker 1990, p.88). In some cases, these were already present in the clause (see example (138)).

(138) She looked at the slip of paper again (appendix one, line 30)

Imperfective progressive instances were identified by the form *auxiliary be V-ing* (Van Rompaey 2013, p.193). Only instances where the search verb was the main verb were included, and instances such as *began to V* or gerund-participial complements such as *begin V-ing* were omitted (see section 3.2.1.3). Therefore, imperfective ingressive and imperfective egressive situations (recognised by aspectualizers like *begin* or *stop*) were not part of the dataset. Depraetere (1995, p.5) argues that not all progressives are unbounded, and those in present perfect form overrule the progressivity and give a bounded reading. However, as this thesis regards perfect tense as tense and not aspect, the perfect tense refers to a situation in progress, indicating incompleteness and therefore imperfective progressive aspect (Declerck et al. 2006, p.38).

Habituality and iterativity were identified by "lexical elements such as adverbials" (Van Rompaey 2013, p.192). As described in section 2.4.7.1, iterativity concerns the repetitiveness of an event. Iterative events were identified from repetitive adverbials (see example (139)), frequency adverbials (see example (140)) and "a plural or collective subject or complement NP accompanied by a non-progressive tense form" (Declerck et al. 2006, p.36) as in example (141). Iterativity is also construed in unbounded imperfective progressive situations, such as in (142).

(139) She hiccupped again (appendix one, line 362)
(140) Thomas sneezed three times (appendix one, like 442)
(141) For years Conservatives ruminated about how… (appendix one, line 139)
(142) I was hiccupping (appendix one, line 387)

Habituality is concerned with situations that are characteristic of the subject. Habituality was identified by repetitive adverbials (see example (143)), frequency adverbials (see example (144)), and context (such as describing someone's characteristic as in example (145)). Past auxiliaries such as *would* also indicate habituality, as shown in (146).

(143) he meditates day and night (appendix one, line 161)
(144) Bodhidharma meditated for 9 years… (appendix one, line 164)
(145) She listens (appendix one, line 70)

(146) They would gossip about their circle of friends (appendix one, line 243)

Following this grammatical aspectual analysis, the dataset was analysed for lexical aspect. We saw in section 2.4 that lexical aspect concerns the expression of inherent temporal meaning aspect by lexical verbs and their arguments (Smith 1991; Declerck et al. 2006). As with the literature on tense and grammatical aspect, there are also differences in the views and categorisations of lexical aspect. The analysis of lexical aspect in this thesis was carried out in line with criteria reviewed in section 2.4, which is based mainly on Vendler (1957), Smith (1991), Rothstein (2004b), Declerck et al. (2006) and Van Rompaey (2013, pp.181–219). Each instance was classified as one of five possible situation types: 'state', 'activity', 'accomplishment', 'culmination' or 'semelfactive'. To identify the situation type, every instance was coded for the six following criteria: dynamic or stative; durative or punctual; transitional or non-transitional; evolving or non-evolving; telic or non-telic; and agentive or non-agentive.

Dynamic events were manly determined by the verbal semantics and additional arguments, as they represent a "change, motion or activity" (Van Rompaey 2013, pp.196-197). Dynamic events were also recognised by adjuncts of manner, such as *frantically* in example (147). Dynamic instances were confirmed using the *do* test, where dynamic events allow periphrasis with *do* (Smith 1991, p.68).

(147) a) They sneezed frantically (appendix one, line 442)
     b) What they did was sneeze frantically
(148) The Soviets are looking for the US to remove the long-standing COCOM (appendix one, line 15)

Stativity is typically identified by the verb type, such as *be, have, seem, feel, love* and *know* (ibid, p.198), though these verb types were not included in this study. In some cases, semantic types in the CPA analysis and the pattern implicatures were used to identify stative or unobservable events, such as metaphors. For example, the instance in (148) had the pattern *[[human]] V for [[event]]* with the implicature *human wants something in relation to a future action*.

The second criterion of situation types – agentivity – was determined in two ways. As a reminder, a situation has an agent if it is performed by an agent or instigator rather than simply happening. The first test for agency was compatibility with the imperative mood; example

(149) shows an agentive clause in the imperative form, whilst example (150) shows how the imperative test does not work with non-agentive clauses, as in (148).

(149) Listen to me (appendix one, line 66)
(150) *look for the US to remove the long-standing COCOM (adaptation of appendix one, line 15)

The second test for agentivity was compatibility with verbs such as FORCE and PERSUADE (Dowty 1979, p.55; Van Rompaey 2013, p.207), as shown in example (151) compared to (152).

(151) I persuaded her to listen to me (adaptation of appendix one, line 66)
(152) *I persuaded him to shiver in the thick coat he'd just bought (adaptation of appendix one, line 393)

The third criterion concerned durativity – situations that last in time – and punctuality – momentary situations (Declerck et al. 2006, p.57; Van Rompaey 2013, p.199). Identifiers of durative events include the compatibility with *stop* complements (see example (153)) and compatibility with adverbs of duration (see example (154)).

(153) a) Everyone was looking at us (appendix one, line 13)
     b) Everyone stopped looking at us
(154) Hume listens for a while (appendix one, line 62)

However, these tests are compatible with punctual situations when the event is a series of a single action (Van Rompaey 2013, p.199), as shown in example (155); in (155b) the person would stop hiccupping in between hiccups, as opposed to in the middle of a hiccup. In (155c) one hiccup does not last for five minutes, but rather hiccups occur consecutively for five minutes.

(155) a) I was hiccupping (appendix one, line 387)
     b) I stopped hiccupping
     c) I was hiccupping for five minutes

Punctual events were identified as transitional or non-transitional as the fourth criterion of situation types. In the progressive form of transitional events, the transition cannot "form part of the 'middle' part of the situation", but non-transitional events can (Declerck et al. 2006, p.59). In example (155), the person has hiccupped in the middle of the situation, and therefore indicates a non-transitional situation. Another key indicator of transitionally is that they have

"preliminary stages" leading up to the event itself, whereas non-transitional events do not (Van Rompaey 2013, p.200).

The fifth criterion of situation types concerns evolvement (see section 2.4.5). Evolving situations represent a gradual change, and are typically recognised by typical verb types such as *increase*, *change, improve, widen,* and *get darker* (Van Rompaey 2013, p.202). No instances were analysed in terms of evolvement as these are not verbs which are representative of Behaviours.

Telicity was the sixth criterion of situation types. We saw in section 2.4.6 that telic events have an inherent termination point whereas atelic events do not (Declerck et al. 2006, p.60). There are several tests that identify telicity, such as compatibility with durative adverbials, completive complements (*to finish* or *to complete*) or prepositional phrases. The telic events that occurred in this dataset were from prepositional phrases headed with *to*, which added a goal to the situation (see example (156)).

> (156) They listened attentively to the announcement (appendix one, line 67)

Table 3-5 visualises how the instances were coded using the criteria above, giving an activity situation as an example. Note that transitionality is marked 'NA' as this criterion is a sub-type of punctuality, and therefore not applicable here.

Table 3-5: The coding process of one instance (concordance line)

Concordance line	Dynamic/ Stative	Durative/ Punctual	Transitional/ Non-transitional	Telic/ Atelic	Agentive/ Non-agentive
People did gossip about us	Dynamic	Durative	NA	Atelic	Agentive

To summarise situation type criteria (see section 2.4), an activity situation type is: dynamic, durative, sometimes evolving, atelic and typically agentive. Accomplishments are similar to activities, though are differentiated by their telicity (compared to atelic activities). Culminations are dynamic, punctual, transitional and agentive, whilst semelfactives are dynamic, punctual, non-transitional and agentive. Finally, states are stative, atelic and non-agentive.

As established in section 2.4.8, whilst there is debate on how to treat the interaction of grammatical and lexical aspect, they were treated and analysed as separately in this study (and thesis more broadly). For example, certain situations in the present simple tense were still considered durative (see example (157)).

(157) She always…gossips (appendix one, line 31)

Researchers such as Declerck et al. (2006) would interpret instances such as those in (157) as states, however this overlooks the inherent dynamicity of the situations where there is an energy input to the event, and skews the data with a high proportion of states (12.4%). Instead, these instances were interpreted as both habitual (grammatical aspect) and dynamic (lexical aspect), as activities have a habitual reading in the simple present tense (Dowty 1979, p.60; Brinton 1987; Levin 2009; Kearns 2011, p.179).

Another feature to potentially influence the interpretation of stative situations was negative polarity i.e., instances of negation. Negators such as *did not* or *cannot* marked negative polarity, as shown in example (158).

(158) He did not gossip to patients (appendix one, line 260)

These instances of negative polarity were treated as part of the verb as opposed to influencing the situation type, for the same reasons as above that it would overlook the inherent dynamic nature of the situation being construed. Having outlined the methodology used in this study of the features of the Behavioural category, we will now consider the results obtained from the analysis process.

3.3 Results: Behaviours as a verbal Category

As outlined in the previous section, 30 concordance lines of 15 verbs (a total of 450 concordance lines) were analysed using Corpus Pattern Analysis (CPA) and tense and aspectual analysis, as a means of exploring the lexico-grammatical features of Behaviours. This section presents the results in two parts. The first part outlines the syntactic patterning and polysemy of each Behavioural verb, revealed from CPA (section 3.3.1). The second part of the results reveals the nature of Behaviours in terms of the five lexico-grammatical features that were investigated, namely, Behaver animacy, intransitivity, (lack of) occurrence with *that*-complements, grammatical aspect and lexical aspect (section 3.3.2). Finally, section 3.4

provides a discussion of the results in terms of the polysemy and prototypicality of the Behaviours.

3.3.1 Results: Corpus Pattern Analysis of Behaviours

This section presents the CPA results of this Behaviours study. Each verb is outline in succession in relation to their patterns, implicatures and frequencies. To clearly represent the patterns in the results, adjuncts are italicised, prepositions are capitalised and optional units are in round brackets. Patterns with phrasal verbs are represented by 'PV'. When five or more semantic types occurred in a pattern, the semantic type was labelled *[[(in)animate participant]]*. If the pattern is dependent on the semantic type, i.e., it changes meaning depending on semantic types, then each semantic type is displayed. Sources of the implicatures are indicated by [P] for Hanks' PDEV, [C] for the COBUILD, [L] for Levin, [G] for Goldberg and [OED] for the Oxford English Dictionary. In the few situations where the implicature was developed from other means, such as collocational, [O] was used for 'other' (see section 3.2.2.1). A frequency count of mood is also displayed for each verb.

3.3.1.1 *Psychological Perception Behaviours*

The three psychological perception Behaviours include *look, stare* and *listen*. Eight patterns were identified for the verb *look* (see Table 3-6). *Look* has the highest number of patterns amongst all the verbs and therefore is the most polysemous. We shall return to a discussion of verb polysemy in section 3.4. In terms of mood, 90% of clauses were expressed in the declarative mood, 7% imperative, and 3% interrogative.

Table 3-6: Corpus Pattern Analysis of the verb Look

Pattern number	Pattern	Implicature	Frequency in data
1	[[human]] V *direction*	[[human]] fixes their gaze in a particular direction [C,OED] E.g., *They looked the other way* (appendix one, line 9)	36.7%
2	[[human]] V AT [[physical_object]]	[[human]] views or fixes their gaze on a [[physical_object]] [C] E.g., *Peter looks at the paper* (appendix one, line 26)	23.4%

Pattern number	Pattern	Implicature	Frequency in data
3	[[human]] V AT [[eventuality]]	[[human]] thinks about an occurrence or event, usually mentioned or indicated [C] E.g., *Look at how he inspires his teammates* (appendix one, line 23)	16.67%
4	[[human_1]] V FOR [[human_ 2 | abstract_entity]]	[[human_1]] actively searches for [[human_ 2 | abstract_entity]] [C] E.g., *I may as well look for him* (appendix one, line 18)	10%
5	[[human]] V FOR [[event]]	[[human]] wants something in relation to a future action [C, OED] E.g., *the Soviets are looking for the US to remove the long-standing COCOM restrictions…* (appendix one, line 15)	3.3%
6	PV: [[machine]] V UP [[information]]	[[machine]] engages in activity of searching for [[information]] [C] E.g., *Resident intelligent agents… looked up recipes online* (appendix one, line 1)	3.3%
7	[[human_1]] V TO [[human_2]] *adverbial*	[[human_1]] views [[human_2]] as a role model [OED] E.g., *Students look to MMEs as a model* (appendix one, line 3)	3.3%
8	[[human]] V ON	[[human]] perceives something, without being involved in the process themselves [C] E.g., *The Panhandler looks on* (appendix one, line 22)	3.3%

Only two patterns were identified for the verb *stare* (see Table 3-7), which was the lowest number of patterns to occur in the data with any given verb. The first pattern with a prepositional complement headed by *at* accounts for nearly two thirds of instances. Every clause (100%) was expressed in the declarative mood.

Table 3-7: Corpus Pattern Analysis of the verb Stare

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal | human]] V AT [[(in)animate_participant]]	[[human]] looks fixedly at [[(in)animate_participant]] (mostly human) with their eyes wide open [P,C] E.g., *Angela Baker stared at her phone receiver* (appendix one, line 34)	63%
2	[[human]] V *direction*	[[human]] looks fixedly with their eyes wide open [P,C] E.g., *You stare out the window* (appendix one, line 35)	37%

Three patterns were identified for the verb *listen* (see Table 3-8). The first two patterns are dominant and are close to an even split between the pattern with a prepositional complement headed by *to* (pattern 1) and the pure intransitive pattern (pattern 2). In the mood analysis, 67% of clauses were expressed in the declarative mood, 30% imperative, and 3% interrogative.

Table 3-8: Corpus Pattern Analysis of the verb Listen

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V TO [[(in)animate_participant]]	[[human]] pays attention to [[(in)animate_participant]] [P,C] E.g., *I could listen to other musicians* (appendix one, line 82)	50%
2	[[human | institution]] V	[[human | institution]] concentrates on hearing or paying attention [P,C] E.g., *Hume listens for a while* (appendix one, line 62)	47%
3	[[human]] V IN ON [[(in)animate_participant]]	[[human]] secretly concentrates on hearing or paying attention to [[(in)animate_participant]] [OED] E.g., *She could listen in on the spaceport security net* (appendix one, line 85)	3%

3.3.1.2 Psychological Cognition Behaviours

The three psychological cognition Behaviours are *ponder*, *ruminate* and *meditate*. Three patterns were identified for the verb *ponder* and the first, transitive pattern was most frequent by almost two thirds (see Table 3-9). *Ponder* was the only verb in this study with a dominance in transitivity, as shall be discussed in section 3.3.2.2. In terms of mood, 93% of clauses were expressed in the declarative mood, and the remaining 7% were interrogative.

Table 3-9: Corpus Pattern Analysis of the verb Ponder

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V [[(in)animate_participant]]	[[human]] wonders about or speculates [[(in)animate_participant]] [C, OED] E.g., *Abby pondered those final words* (appendix one, line 96)	60%
2	[[human]] V	[[human]] thinks in depth [C, OED] E.g., *Lucian pondered for a few moments* (appendix one, line 116)	33.3%
3	[[human]] V ON/OVER [[(in)animate_participant]]	[[human]] reflects on or thinks over [[(in)animate_participant]] [C, OED] E.g., *He pondered over my answer for a while* (appendix one, line 117)	6.7%

Four patterns were identified for the verb *ruminate* (see Table 3-10). The pattern with prepositional heads *on*, *over* or *about* was most common (50%), followed closely by the pure intransitive (40%). Every clause (100%) was expressed in the declarative mood.

Table 3-10: Corpus Pattern Analysis of the verb Ruminate

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V ON/ OVER/ ABOUT [[(in)animate_participant]]	[[human]] reflects on or thinks over / about [[(in)animate_participant]] repeatedly [C, OED] E.g., *my character ruminates on his mama* (appendix one, line 127)	50%

Pattern Number	Pattern	Implicature	Frequency in data
2	[[human]] V	[[human]] thinks in depth and turns over repeatedly in mind [C, OED] E.g., *as the emperor ruminated* (appendix one, line 131)	43.4%
3	[[animal]] V [reflexive] WAY THROUGH [[plant]]	[[animal]] eats their way through [[plant]] [G, OED] E.g., *the picturesque but impractical cows ruminated their way through much of the family fortune* (appendix one, line 132)	3.3%
4	[[human V]] FOR [[abstract_entity]]	[[human]] searches for/thinks deeply about own views on [[abstract_entity]] [O] E.g., *He ruminated for his own [afterthoughts]* (appendix one, line 123)	3.3%

Two patterns were identified for the verb *meditate* (see Table 3-11). The first, pure intransitive pattern is most dominant by nearly two thirds. In terms of mood, 90% of clauses were expressed in the declarative mood, 6.7% interrogative, and 3.3% imperative.

Table 3-11: Corpus Pattern Analysis of the verb Meditate

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] focuses their mind on calm thoughts in order to achieve an altered state of consciousness [P] E.g., *The Elder meditated for a long while* (appendix one, line 155)	63%
2	[[human]] V ABOUT/ ON/ UPON [[(in)animate_participant]]	[[human]] thinks deeply and at length about [[(in)animate_participant]] [P] E.g., *The priest meditated on his celibacy* (appendix one, line 165)	37%

3.3.1.3 Communication Behaviours

The three communicative Behaviours are *talk*, *converse* and *gossip*. Four patterns were identified for the verb *talk* (see Table 3-12). The first pattern is the most dominant (79.9%) and

the remaining three each are equally as infrequent. In terms of mood, 83% of clauses were expressed in the declarative mood, 10% in the imperative, and 7% in the interrogative mood.

Table 3-12: Corpus Pattern Analysis of the verb Talk

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human_1]] V (TO/WITH [[human_2]]) (ABOUT [[(in)animate_participant = topic]])	[[human_1]] discusses topic with [[human_2]] [P] E.g., *Whenever I talk to women about the new book I've written…* (appendix one, line 208)	79.9%
2	[[human]] V	[[human]] engages in the unique human ability to use language [P] E.g., *As he talks,…* (appendix one, line 183)	6.7%
3	[[human]] V OF [[(in)animate_participant = topic]]	[[human]] mentions a topic [P] E.g., *We are not talking of driving ability* (appendix one, line 203)	6.7%
4	[[human_1]] V [[reflexive | human_2]] *direction*	[[human]] persuades [[reflexive | human_2]] into doing something [C,OED] E.g., *Then I talked myself back to Boise State* (appendix one, line 185)	6.7%

Two patterns were identified for the verb *converse* (see Table 3-13). The first pattern is nine times more common than the second. In terms of mood, 97% of clauses were expressed in the declarative mood and 3% in the interrogative mood.

Table 3-13: Corpus Pattern Analysis of the verb Converse

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal_group | human | human_group]] V (with [[human_2]]) (about [[(in)animate_participant = topic]])	[[animal_group | human | human_group]] discusses topic (with [[human_2]]) [P,C] E.g., *We converse like old times* (appendix one, line 218)	90%

Pattern Number	Pattern	Implicature	Frequency in data
2	[[animal_group | human]] V in [[tone | language]]	[[animal_group | human]] communicates in a particular way [P,C] E.g., *Rist could converse in a pidgin Low Land tongue* (appendix one, line 232)	10%

Two patterns were identified for the verb *gossip* (see Table 3-14). Similar to *converse,* the first pattern of *gossip* is over nine times more dominant than the second. In terms of mood, 97% of clauses were expressed in the declarative mood and 3% in the imperative mood.

Table 3-14: Corpus Pattern Analysis of the verb Gossip

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human_1]] V (TO/WITH [[human_2]]) (ABOUT [[(in)animate_participant]])	[[human_1]] engages in talk of casual and trivial nature, typically regarding the lives of other people and often unsubstantiated (to/with [[human_2]]) (about [[(in)animate_participant]]) [P] E.g., *People did gossip about us* (appendix one, line 262)	93.3%
2	[[human]] V {THAT-CLAUSE}	[[human]] engages in talk of casual and trivial nature, that [clause] [P] E.g., *They'd gossip that I don't earn enough money to provide for you* (appendix one, line 245)	6.7%

3.3.1.4 *Physiological Emotion Behaviours*

The three psychological emotion Behaviours are *frown*, *laugh* and *cry*. Two patterns were identified for the verb *frown* and the most dominant pattern is the pure intransitive (see Table 3-15). Every clause (100%) was expressed in the declarative mood.

Table 3-15: Corpus Pattern Analysis of the verb Frown

Pattern Number	Pattern	Implicature	Frequency in data
1	[[body_part | human]] V	[[human]] furrows their brows, usually expressing disapproval or displeasure [P] E.g., *The cop frowned* (appendix one, line 286)	77%
2	[[human]] V AT/OVER [[(in)animate_participant]]	[[human]] furrows their brows, expressing disapproval at/over [[(in)animate_participant]] [P] E.g., *Dolly Jaye frowned at Christina* (appendix one, line 298)	23%

Three patterns were identified for the verb *laugh* (see Table 3-16). The first, pure intransitive pattern is by far the most dominant (93.4%). In terms of mood, 97% of clauses were expressed as declarative and 3% imperative.

Table 3-16: Corpus Pattern Analysis of the verb Laugh

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] expresses amusement by expelling air from the lungs and making an inarticulate voiced noise with the mouth open [P] E.g., *He really laughed a lot* (appendix one, line 304)	93.4%
2	[[human_1]] V AT [[human_2]]	[[human_1]] expressing amusement at [[human_ 2]] [P] E.g., *Caz laughs at the attempt to seduce with black music* (appendix one, line 316)	3.3%
3	[[human]] V{laugh}	[[human]] expresses amusement by expelling air from the lungs and making an inarticulate voiced noise with the mouth open, in a particular manner [OED] E.g., *Judar laughed that course laugh of his* (appendix one, line 306)	3.3%

Two patterns were identified for the verb *cry* (see Table 3-17). The first pattern of *cry* is the pure intransitive and by far the most dominant (93.3%). In terms of mood, 93.4% of clauses were expressed as declarative, 3.3% interrogative and 3.3% imperative.

Table 3-17: Corpus Pattern Analysis of the verb Cry

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] weeps (usually because human is unhappy or in pain) [P] E.g., *He is crying silently* (appendix one, line 341)	93.3%
2	[[human]] V OUT	[[human]] shouts loudly (usually because [[human]] is distressed or in pain) [P] E.g., *Our pursuers cried out also* (appendix one, line 337)	6.7%

3.3.1.5 *Other Physiological Behaviours*

The other physiological Behaviours are *hiccup*, *shiver* and *sneeze*. Six patterns were identified for the verb *hiccup* (see Table 3-18), which is the second highest number of patterns of a given verb (behind the eight patterns of *look*). The first, pure intransitive pattern accounts for almost two thirds of *hiccup* instances. Every clause (100%) was expressed in the declarative mood.

Table 3-18: Corpus Pattern Analysis of the verb Hiccup

Pattern Number	Pattern	Implicature	Frequency in data
1	[[body_part	human]] V	[[human]] makes sudden, violent, and involuntary contraction, causing a gulping sound [L] E.g., *She hiccupped again* (appendix one, line 362)	63.4%
2	[[machine	vehicle]] V	[[machine	vehicle]] machine or vehicle breaks, usually moving with one or more sudden convulsive movements [O] E.g., *The machine would hiccup* (appendix one, line 374)	20%

Pattern Number	Pattern	Implicature	Frequency in data
3	[[human]] V [[speech_act]]	[[human]] draws a slight breath/laugh in a state of weakness [O] E.g., *She hiccupped a breath* (appendix one, line 368)	6.7%
4	[[heart]] V *accompaniment*	[[heart]] skips a beat, in a state of fear [O] E.g., *Vicki's heart hiccupped with fear* (appendix one, line 377)	3.3%
5	[[human]] V	[[human]] makes a mistake [O] E.g., *You can hiccup [and go $10 million over]* (appendix one, line 361)	3.3%
6	[[machine]] V [[fluid]]	[[machine]] expels [[fluid]], usually because machine is faulty [O] E.g., *The generator hiccupped some bad diesel* (appendix one, line 367)	3.3%

Two patterns were identified for the verb *shiver* and the first, pure intransitive pattern is by far the most dominant (see Table 3-19). Every clause (100%) was expressed in the declarative mood.

Table 3-19: Corpus Pattern Analysis of the verb Shiver

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal | body_part | human]] V	[[human]] shakes slightly and uncontrollably, typically as an involuntary reaction to cold or Emotion [P] E.g., *Jonah shivered* (appendix one, line 401)	97%
2	[[human]] V AT [[concept]]	[[human]] shakes slightly and uncontrollably, when reflecting on or bringing to mind a [[concept]] [P] E.g., *I shivered at the thought of severed chicken and pig souls trying to find their way to Heaven to piece themselves together again* (appendix one, line 414)	3%

Two patterns were identified for the verb *sneeze* (see Table 3-20). The first, pure intransitive pattern is by far the most dominant (97%). Every clause (100%) was expressed in the declarative mood.

Table 3-20: Corpus Pattern Analysis of the verb Sneeze

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal	human]] V	[[human]] makes sudden, violent, and involuntary expulsion of air and mucus through the nose and mouth [P] E.g., *Aunt Manjit sneezed twice* (Appendix one, line 437)	97%
2	PV: [[human]] V OUT [[particle]]	[[human]] makes sudden and violent expulsion of [[article]] through the nose and mouth [OED] E.g., *Microscopic particles…can't be sneezed out* (Appendix one, line 437)	3%

3.3.2   Results: Lexico-grammatical Features of Behaviours

The aims of this Behaviours study are twofold: to use empirical evidence to identify a reliable set of lexico-grammatical descriptors of Behavioural verbs; and to determine the extent to which Behaviours can be empirically established as a category. Each of the five lexico-grammatical features will be presented in turn.

3.3.2.1   *Animacy of Behaviours*

Overall, 98.2% of the Behaver participants were animate (see Figure 3-1). The most frequent animate semantic type was *human* (97.5%), and the remaining included *animal* (1.6%) or instances of metonymy such as *body part* (0.7%) or *institution* (0.2%). The large majority of animate subjects suggest a strong correlation between animacy and Behaviours and therefore we can assume that most Behaviours have animate subjects. This animacy result supports the claim made in relation to Systemic Functional Linguistics (SFL), that the Behaver in the behavioural process is "typically a conscious being" (Halliday 1994, p.139). However, subject animacy may rather be a feature of intransitive verbs more broadly since, as Smith (1978a, fn 12 p.109) explains, "most intransitive verbs in English require animate subjects". In addition,

van Gelderen (2018, pp.28–29) points out that the subject of unergative verbs (see discussions in Chapter 2) are typically human or animate. Given these two descriptions about intransitive clauses, animacy is likely a feature of intransitives in general rather than of Behaviours specifically, though Behaviours inherit the animacy feature given their typical unergative intransitive clause structure. While this seems highly probable, the position that unergative intransitives are always expressed with an animate subject has not yet, to the best of my knowledge, been tested empirically. We will return to this question of intransitive animacy in Chapter 4.
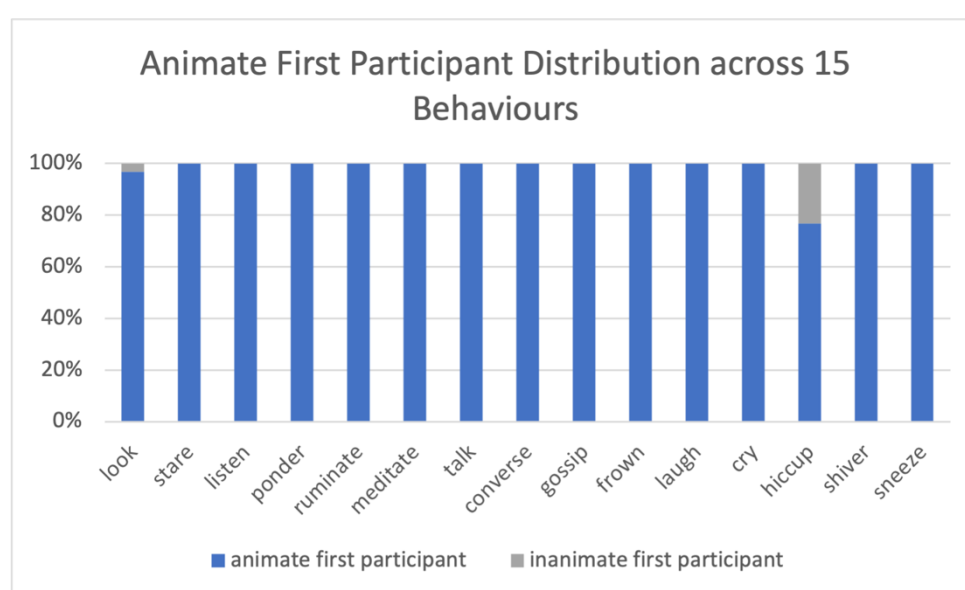
Figure 3-1: A graph displaying the distribution of animate Behavers across 15 Behaviours

There were no trends or differences in animacy between the five semantic sub-groups and the only verbs associated with an inanimate participant were *look* (3% of *look* instances) and *hiccup* (23% of *hiccup* instances). The instances of *look* had the pattern *machine looks up information* and the instances of *hiccup* had the patterns *machine/vehicle hiccups* or *machine hiccups fluid* (see sections 3.3.1.1 and 3.3.1.5 respectively). Whilst the high frequency of subject animacy was no surprise considering the verbal semantics of these Behavioural experiences, it was interesting that the semantic types of the remaining inanimate instances (1.8%) were either a *machine* or *vehicle*. It might be that these semantic types take the metaphorical interpretation more easily as they are both objects that operate, so have the ability to 'behave' in certain ways such as in example (159).

(159) The car hiccupped to a stop (appendix one, line 366)

The semantic type of the subject of *hiccup* changed the Behavioural implicature in *human V* ('human makes sudden, violent, and involuntary contraction, causing a gulping sound') to a motion verb of manner in *machine/vehicle V* ('machine / vehicle breaks, usually moving with one or more sudden convulsive movements'). This latter pattern is likely reflective of a different verbal category, such as an action event or the material process in SFL (which represent physical happenings, as shown in section 2.2.1), as they do not necessarily have animate first participants or actors (Halliday 1994, p.115).

However, as mentioned above, we do not yet know whether the features in question are inherent to Behaviours or to the more general category of unergative intransitives. For example, to be confident about the discussion here, we would want to know what (if any) differences there are between Behaviours and other unergative intransitives such as action events (e.g., material processes in SFL) that only take an animate first participants. This overlap of Behaviours and Intransitive Actions will be explored later on in the thesis (see Chapter 4).

3.3.2.2   *Intransitivity of Behaviours*

The intransitivity analysis revealed that 94.2% of instances were intransitive and therefore intransitivity seems to be a prevalent feature of Behaviours. The large majority of intransitive clauses upholds claims in SFL literature regarding the behavioural process that "the most typical pattern is a clause consisting of a Behaver and Process only", which "regularly feature a prepositional phrase" (Halliday 1994, p.139). The finding is also consistent with Levin's (1993) work (outlined in Chapter 2), where the majority of these verbs under investigation are predominantly recognised as intransitive. As a typical unergative intransitive set of verbs, these intransitivity results were largely expected. For eight verbs – *stare*, *listen*, *meditate*, *converse*, *frown*, *laugh*, *shiver* and *cry* – every instance was intransitive, whilst six verbs – *look, ruminate, sneeze*, *gossip*, *talk* and *hiccup* – had at least 90% of intransitive instances (see Figure 3-2).

Whilst the data has shown that most of these verbs are truly intransitive, there was one anomaly in this group. One verb – *ponder* – was found to have a low frequency (40%) of intransitive uses, where more than half were transitive; this was the only verb to reveal a higher frequency of transitive than intransitive instances. As a reminder, *ponder* was included in the verb selection process because it meets the initial criteria of a Behaviour (see section 1.3) and it was also identified as a behavioural process within SFL literature (Matthiessen 1995; Martin et al.

1997; Halliday and Matthiessen 1999; Butler 2003). However, after carrying out this corpus research, its actual use in language shows that the verb tends towards transitive instances, though these transitive uses could still express a Behaviour. Halliday does not totally exclude transitives from the behavioural process, but they are shown to sometimes have a Behaviour or Range as second participant (cf Halliday 1994, p.146), and there are also clear transitive uses such as the typical behavioural verb *watch* as the main verb in transitive behavioural processes (Halliday 1994, p.139). While *ponder* is somewhat of an outlier, it seems clear that its lexico-grammatical nature is not typically representative of the category of Behaviourals. The intransitive instances of *ponder*, which do have an animate first participant (Behaver), can easily be classed a Behaviours; however, the transitive instances appear to act grammatically like an action (or material process in SFL) whilst the semantics are comparable to the Senser and Phenomenon of a mental process.
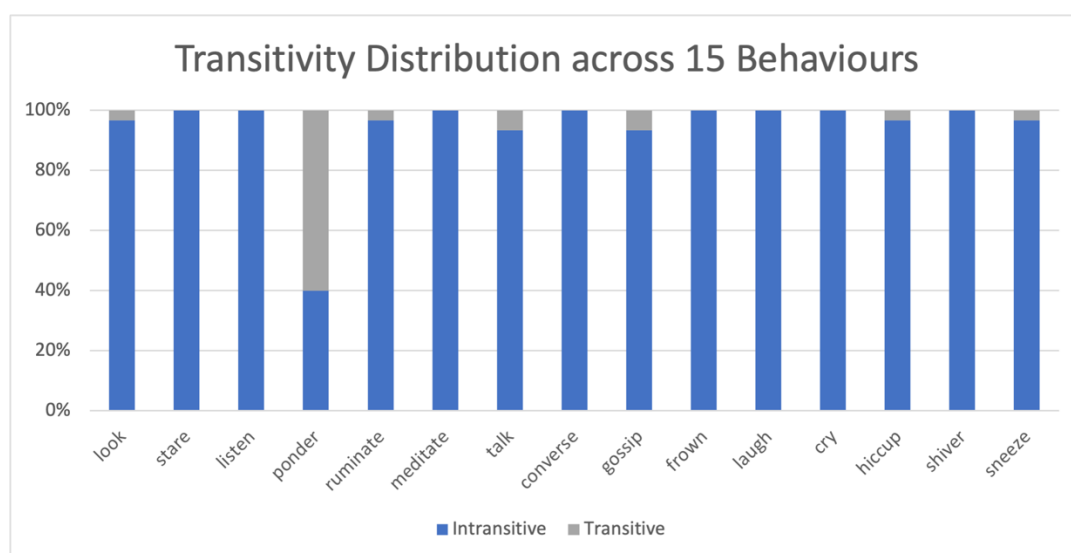
Figure 3-2: The distribution of transitive and intransitive clauses across 15 Behaviours

We might consider removing the transitive instances to gain a clearer sense of the pure intransitive group, although these instances (besides *ponder*) were minimal and did not make any real differences to the dataset (in the sense that their other features were similar to the other instances of Behaviours). For example, every transitive instance had an activity situation type, besides one semelfactive with *sneeze*, which are both typical situation types of Behaviours and reflects the intransitive dataset (as we shall see in section 3.3.2.4). Similarly, the majority of present tense instances had perfective aspect (63%)[19], which was also typical of the intransitive

---

[19] This frequency (63%) is lower than the whole dataset (80%), though it only concerns 8 present tense instances and therefore is less representative.

data (explained in section 3.3.2.5). Animacy was the only difference, where two out of eight transitive instances (25%) were inanimate (still excluding *ponder*).

Differences were found between the five semantic sub-groups in terms of their typical patterning. These differences are summarised in Table 3-21, and each verb is colour-coded depending on their semantic category: psychological perception are purple, psychological cognition are blue, communicative are orange, physiological emotion are green, and other physiological are red. All physiological Behaviours (physiological emotion – *laugh, frown*, *cry* and other physiological – *hiccup, shiver, sneeze*) most frequently occurred in the bare intransitive construction, where either nothing or adjuncts followed the verb. Communicative Behaviours (*talk, converse, gossip*) and psychological perception Behaviours (*look*, *stare*, *listen*) all most frequently occurred in intransitive constructions with prepositional complements. Psychological cognition Behaviours were the only sets to vary the typical construction types within their groups; the typical construction of *ponder* was transitive with a direct object following the verb, whilst *meditate* was mostly simple intransitive and *ruminate* intransitive with a preposition complement. Given the differences in the grammatical structure of the psychological cognition verbs, they might have been misclassified in the theory. For example, considering the high frequency of *meditate* as a pure intransitive (63%) with no complement of thought, it might be better classified as a physiological verb as opposed to cognitive (as initially indicated by Halliday and Matthiessen (1999, p.142)). Additionally, *ruminate* might be more connected to the communicative verb types where the verbs most frequently occurred with a prepositional complement, and also where collective NP subjects of *ruminate* could imply more of a communicative act, such as *they ruminated on death and dead relatives* (appendix one, line 130).

Table 3-21: A summary of the most common constructions across 15 Behavioural verbs

Most common construction	Verb
Simple intransitive (eg. *Human V*)	Meditate, Hiccup, Shiver, Sneeze, Laugh, Frown, Cry
Intransitive with prepositional complement (eg. *Human V to (in)animate_participant*)	Ruminate, Talk, Converse, Gossip, Stare, Look, Listen
Transitive construction (eg. *Human V (in)animate_participant*)	Ponder

3.3.2.3 *Occurrence of that -complements in Behaviours*

The results revealed that 99.6% of patterns in the dataset did not occur with a *that*-complement (see Figure 3-3), suggesting that Behaviours do not tend to attach *that*-complements. Evidently, there were no trends according to the semantic groups.
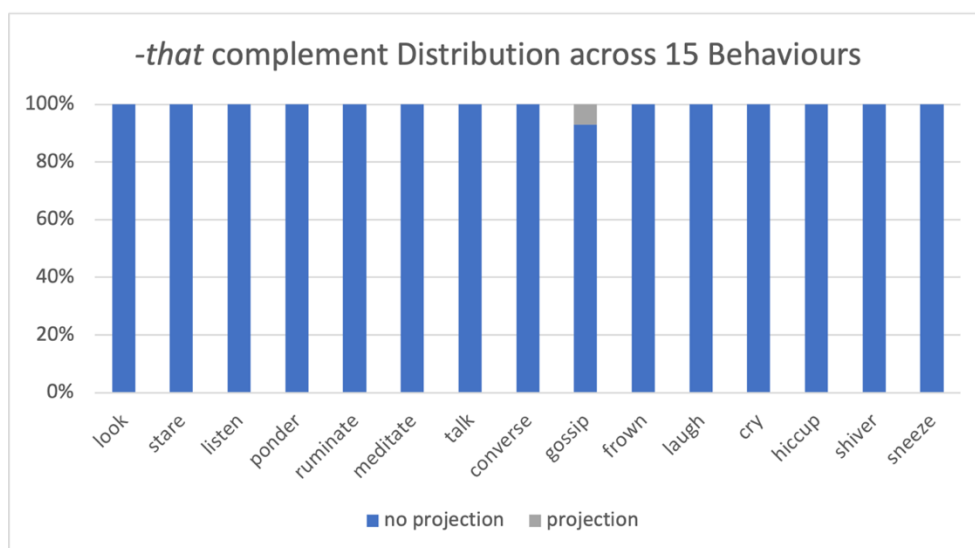
Figure 3-3: The distribution of that-complements across 15 Behaviours

The 0.4% of *that*-complements only occurred with the verb *gossip*, in the pattern *[[human]] V {that-clause}*, which represented anomalies of a verbal experience as opposed to Behaviours (see example (160).

> (160) People gossiped that she was a Ma, a ghost (appendix one, line 250)

Interestingly, Martin et al. (1997, p.126) claim that "we cannot say *they gossiped that their neighbours had had a wild party*", yet these results have shown that it is possible to use *that*-complements with *gossip.* Whilst these constructions are possible, they are very infrequent which suggests that they are not established norms in terms of Hanks' Theory of Norms and Exploitations (see section 3.2.2.1 above), but exploitations that are "deliberate departure[s] from an established pattern" (Hanks 2013, p.212).

The overwhelming majority of instances that lacked an attachment with *that*-complements supports claims in SFL literature that the primary clause of a behavioural process cannot incorporates a secondary clause using the conjunction 'that' (Halliday 1994, pp.139, 219). In terms of SFL, we find minimal evidence that these verbs can be used in verbal or mental

process types. The two instances that did occur with a *that*-complement would likely be categorised as verbal processes in SFL, because they semantically represent a communicative event and grammatically occur with the *that*-complement (see section 2.2.1).

3.3.2.4   *Lexical Aspect of Behaviours*

Overall, 85.5% of instances were activities, 13% semelfactives, 1.1% accomplishments and 0.4% states (see Figure 3-4). Thus, an activity or semelfactive situation type appears to be a prevalent feature of Behaviours. There were no substantial trends according to the five semantic sub-groups, though in three groups (psychological cognition, physiological emotion and communicative) every instance was an activity, whilst two groups showed a greater divergence.
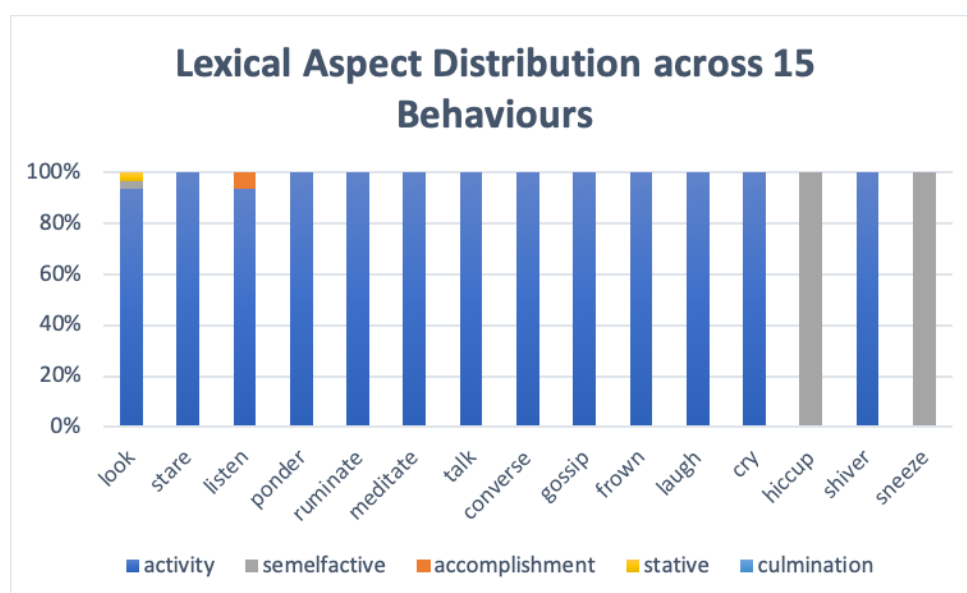
Figure 3-4: The distribution of the five lexical aspect types across 15 Behaviours

In the other physiological group, every instance of *shiver* was an activity and every instance of *sneeze* was a semelfactive. The instances of *hiccup* were almost always semelfactive (93%) and the remainder were activities (7%) as a result of a change in the pattern.

In the psychological perception Behaviours group, every instance of *stare* was an activity. *Look* was mostly activities (93.34%) but also sometimes states (6.66%). These were the only states in the dataset, used metaphorically. For example, one state had the implicature 'to want something or perceive someone in a certain way' (see example (161)).

(161) Students look to MMEs as a model (appendix one, line 3)

Listen mostly occurred as an activity (83.3%) but also accomplishments (16.7%). These were the only instances of accomplishments in the dataset and were telicized (coerced from atelic to telic) by the complement in the pattern *human V to (in)animate participant.* Compare the telic instance in example (162) to the atelic instance in example (163).

(162) They listened to one [scene] (appendix one, line 77)
(163) I could listen to other musicians (appendix one, line 82)

3.3.2.5 *Grammatical Aspect of Behaviours*

Of all the present tense instances, 80% had perfective aspect, 19% imperfective progressive aspect and 1% imperfective aspect. Thus, there appears to be a strong tendency for Behaviours to have perfective aspect in the present tense. This perfectivity result was the most revealing result of the Behaviours study as it was the only lexico-grammatical feature to contradict the theoretical literature. Although it is widely reported in literature, especially in SFL, that present tense Behavioural verbs occur in the progressive form (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Eggins 2004, p.234; Leech 2004, p.24; Langacker 2008, p.148), this was not upheld by the results presented here. We saw section 3.1.2 that Langacker (2008, p.148) considers Behaviours to semantically denote stative events and grammatically occur in the progressive form (he uses the terms perfective and imperfective but in slightly different ways, though this distinction is avoided here for clarity). However, these results showed that the data instances grammatically function in the same way as other stative events, though as shown from the lexical aspect results, they are dynamic events (typically activities or semelfactives).

There were no apparent trends according to the five semantic sub-groups. Fourteen of the 15 Behaviours expressed perfective aspect in the majority of instances (see Figure 3-5), whilst one Behaviour, *cry*, had a majority of imperfective progressive aspect instances (82% imperfective progressive compared to 18% perfective). Interestingly, 40% of instances of *listen* were imperatives and so they were not analysed for grammatical aspect – this stood out as a high percentage of use considering the next highest frequency of imperative was 10% with *talk*.
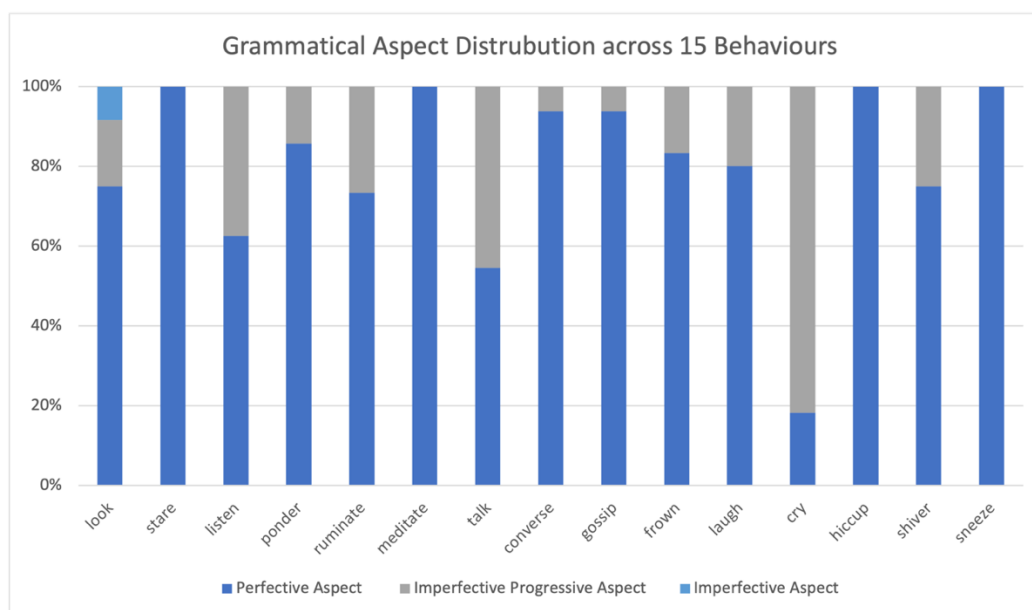
Figure 3-5: The distribution of perfective and imperfective aspect across 15 Behaviours

It can be speculated that the registers of the text had an effect on the high frequency of perfectives. For example, 47% of these present tense perfective instances were from fiction sources that involve narratives, in line with Trinh et al.'s (2017, p.122) claim that behavioural processes are typically used in narratives. The remaining sources included magazines (18.5%), newspapers (13%), academic journals (11%) and transcripts of spoken language (10.5%). It is not in the scope of this research to investigate register further, though investigating reasons for the high frequency of perfectives point towards what could be a worthwhile area of research.

Most present tense instances were non-habitual (73%) or non-iterative (93.5%), and therefore there was no tendency for simple present tense Behaviours to represent habituality or iterativity. This habituality result was not surprising as non-habitual instances of simple present Behaviours (or behavioural processes in SFL) are recognised, although less common (Halliday 1994, p.139; Bartley 2017, p.60).

3.4 Discussion: Polysemy and prototypicality of the Behaviours category

The results so far have shown that Behaviours correlate with subject animacy, intransitivity, absence of *that*-complements, perfective aspect and activity or semelfactive situation types. The prototypicality of each verb was identified according to these five typical lexico-grammatical features. As stated in section 3.2.2, each feature of each verb was given a score and the overall mean was calculated per verb. For example, all instances of *stare* were animate

(a typical feature of Behaviours – see section 3.3.2.1) and therefore *stare* was given a score of 1, whilst 29/30 instances of *look* were animate, and therefore was given a score of 0.97. Results are displayed in Figure 3-6, and verbs are colour-coded depending on their semantic sub-type; psychological perception are purple, psychological cognition are blue, communicative are orange, physiological emotion are green, and other physiological are red. Each bar is labelled with a number which refers to the number of patterns the verb occurred in, for example *stare* in two and *look* in eight. The overall homogeneous high scores of prototypicality give grounds for Behaviours as their own verbal category, though there was no trend in the semantic groups, suggesting that no one semantic type is more representative of a Behaviour than another.
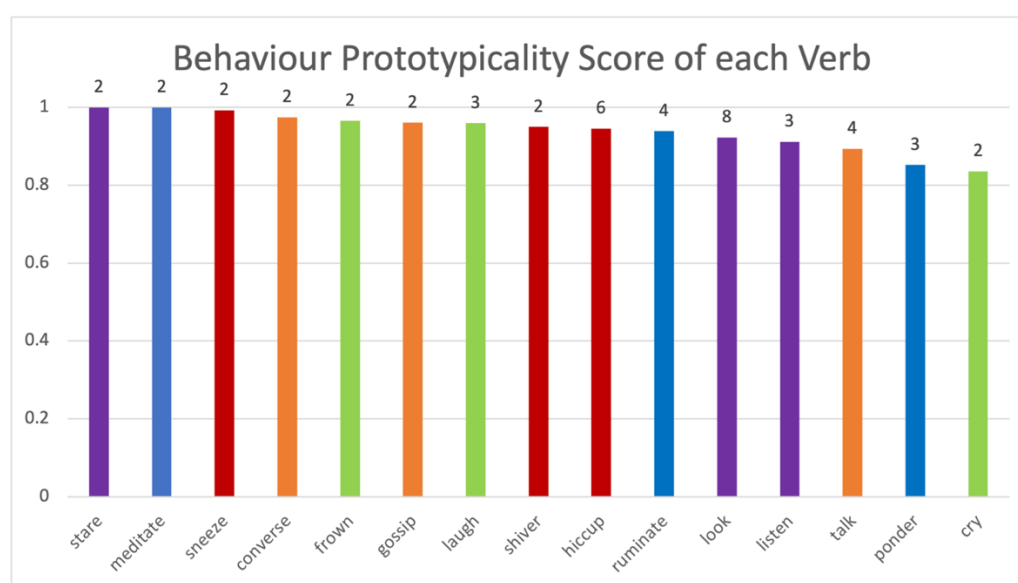
Figure 3-6: A score of category prototypicality across 15 Behaviours

The number of patterns revealed by CPA indicated the verb's polysemy; the higher the number of patterns, the more polysemous the verb was. Each pattern represents a different verb sense, so those verbs that occur in more patterns are more flexible in their semantic potential. Overall, the first eight (53%) most prototypical Behavioural verbs generally had low verb polysemy in that they occurred in a low number of patterns (mostly two but also *laugh* occurred in three). However, there was no clear trend in polysemy and Behaviour prototypicality as the least prototypical verbs (*cry* and *ponder*) also occurred in a low frequency of patterns (two and three respectively). Like the most prototypical verbs, *cry* and *ponder* are relatively fixed in their nature and do not lend themselves to much pattern variation.

We will now consider the polysemous verbs nature of verbs from the most polysemous to least polysemous, and consider semantic shifts to other categories. *Look* is most polysemous with eight patterns and is more prototypical than four other Behavioural verbs. Three patterns are in the typical perceptive sense (patterns 1, 2 and 8 – see section 3.3.1.1). Pattern 3, *[[human]] looks at [[eventuality]]*, represents a thought process and though this does not reflect the current 'psychological perception' category that *look* was placed in, it could be considered a Behaviour under the 'psychological cognition' category (which initially included *ponder, meditate* and *ruminate*). The semantic types were key distinguishers between some of these pattern meanings, which had the same grammatical patterning. For example, patterns 2 and 3 both include a prepositional phrase headed by *at* but have different implicatures[20]. Two patterns (4 – *[[human]] looks for [[human/abstract_entity]]* and 6 – *[[machine]] looks up [[(in)animate_participant]]*) are grammatically similar to Behaviours and actions (see section 2.2.1 on SFL theory), but the physical action of searching is semantically closer to an action process. The two remaining patterns (5 and 7), semantically represent mental experiences (reflected in their stative situation types), but grammatically represent Behaviours or actions, suggesting a divergence in semantics and syntax. One particularly interesting case is the one instance of pattern 5, which represents a state but also imperfective progressive aspect (see example (164)). Whilst states are often considered to occur with perfective aspect (Declerck et al. 2006, p.49), I have treated grammatical and lexical aspect separately to obtain a full picture of the temporality of clauses. As Comrie points out (1976, pp.103–104), the imperfective progressive aspect coerces the state into a temporary reading. These instances are regarded as infrequent (Van Rompaey 2013, p.230), as my data has also shown. In example (164), there appears to be a tension between the stative clausal semantics and the lexical semantics of the verb, which is typically dynamic. This typical dynamicity of *look* might have allowed for more flexibility in grammatical aspect than typical stative verbs, such as *want* or *desire* for example.

(164) The Soviets are looking for the US to remove the long-standing COCOM
        (appendix one, line 15)

---

[20] Whilst not within the scope of this research, investigating the semantic types or properties of polysemous verbs compared to less polysemous verbs is an interesting area of future study in terms of identifying what the lexical constraint is on less polysemous verbs.

Hiccup is the verb with the second highest number of patterns (6) and therefore second most polysemous. Patterns 1, 3 and 4 represented physiological Behaviours (see implicatures in section 3.3.1.5). Pattern 2, *[[machine / vehicle]] hiccups*, is interesting because it is Behavioural in the grammatical patterning as well as the implicature of moving with sudden convulsive movements and causatively breaking, though the lack of subject animacy and potential for causation suggest it is not a Behaviour. As the syntax is also representative of actions, this pattern would likely be classed as an action. Pattern 5, *[[human]] hiccups* (same as pattern 1), grammatically represents a Behaviour (and action), though the semantics indicates physicality (making a mistake) and therefore appears more of an action. Pattern 6, *[[machine]] hiccups [[fluid]]*, also likely represents an action because it is transitive, has an inanimate subject and semantically represents a physical event. The relatively high degree of polysemy in the two verbs outlined so far, *look* and *hiccup*, shows that they have a greater meaning potential (in Hanks' sense) and have a less fixed nature in terms of grammatical patterning compared to the remaining verbs. Their flexibility suggests why they were further down the prototypical score, as a wider variety of patterns implies more coercion in their semantics to an alternative description (i.e., something other than a Behaviour), however as shown above there were less prototypical verbs with lower pattern numbers. Interestingly, these two most polysemous verbs (*hiccup* and *look*) were the only verbs in the dataset to have animate subjects (see section 3.3.2.1), and therefore it could be suggested that greater polysemy is linked to greater flexibility in the participant animacy configuration.

Two verbs – *ruminate* and *talk* – occur within four different patterns, which is a relatively average degree of polysemy in this dataset. Patterns 1, 2 and 4 of *ruminate* and 1, 2 and 3 of *talk* indicate Behaviours, where the prepositional attachment altered the meaning slightly. For example, *human talks with human about (in)animate_participant* (pattern 1) represents a discussion whereas *human talks of (in)animate_participant* (pattern 3) represents a briefer communicative act of mentioning something. The third pattern of *ruminate* was a 'way' construction – *animal ruminates way through plant* – and denotes the action of eating, which is a clear change in the semantics of the verb. The fourth pattern of talk (*human talks self/human_2 direction*) is similar to a verbal process – in SFL terms, it is transitive with a Sayer and Receiver and semantically denotes a process of saying. Note that the semantics of saying is "in a rather broad sense" that "covers any kind of symbolic change of meaning" (Halliday 1994, p.140).

Three verbs – *ponder*, *listen* and *laugh* – occur in three patterns, and eight verbs – *meditate*, *stare*, *shiver*, *frown*, *cry*, *converse*, *sneeze*, and *gossip* – occur in only two patterns, indicating a low degree of polysemy. Most of these patterns represent Behaviours, though certain patterns stray from the typical Behavioural clause structure, such as the *that-* complement in pattern 2 of *gossip*. The low degree of polysemy in a majority of the verbs suggests that Behaviours, a specific type of pure intransitives, have a relatively fixed meaning. In Hanks' (2013) sense of meaning potential, a Behavioural verb is typically restricted in its meaning potential.

Overall, the lower the polysemy of verbs, the more conservative the patterns tend to be, and the higher the polysemy, the greater the innovation of the patterns. In other words, the strength of association to the construction (process type) is weakened in more polysemous verbs because they become more exploited. The verbs occurring in more patterns reveal greater tensions between semantics and syntax, suggesting that the more flexible a verb is then the more likely this divergence will occur (as discussed with pattern 5 of *look* above). Thus, polysemy makes certain instances more difficult to categorise as they shared features with other verb processes, blurring the lines between which category they belong in (Behavioural or another one). Consideration of alternative intransitive classification is addressed in section 4.6.

There are no clear explanations for the variation in pattern numbers between these verbs. One suggestion is the frequencies of the verb instantiations. For example, the more pattern numbers and thus the more polysemic verbs, the higher the normalised frequency might be of the verbs in the corpus in general. Normalised frequency refers to the number of verb tokens in relation to the number of words in the corpus, which provides a comparative frequency of the verbs more generally (Gries 2010, p.271). Though not in the scope of this research, investigating the polysemy against frequency would be an interesting line of research in future. Alternatively, certain verbs might have more lexical constraints that do not allow them to occur in different patterns as naturally, compared to others that are able to move more freely into other patterns and meanings. In this sense, some verbs might have features that are more susceptible to exploitations of language (in Hanks' (2009; 2013) sense) such as metaphors. For example, the figurative uses of *hiccup* (see section 3.3.1.5) display "creative…choices within the boundaries of possible language use" (Hanks 2013, p.212).

3.5 Concluding the exploration of Behaviours

As stated in section 3.1.4, this chapter aimed to empirically evaluate the extent to which a Behaviours category is justified, including two sub-aims: to use empirical evidence to identify a reliable set of lexico-grammatical descriptors of Behavioural verbs; and to determine the extent to which Behaviours can be empirically established as a category. Systemic Functional Linguistics (SFL) theoretically proposes the behavioural process category, which I have labelled the Behaviours category more generally (with some exclusions of Behavioural process criteria, see section 1.3.1), though it is indeterminate in nature and classification can be ambiguous.

The present Behaviours study has used empirical data to test the theoretical description of the Behaviours category and has confirmed that there is a case to argue for Behaviours as its own category. The results indicated that Behaviours typically display the following five lexico-grammatical features: the constructions are intransitive; the subject is animate; they do not occur with *that*-complements; they typically represent activity or semelfactive situation types; and in present tense they typically represent perfective grammatical aspect. The high percentage of perfective Behaviours (80%) was particularly surprising as it contradicted current theoretical claims that behavioural verbs typically occur in the progressive form (Halliday 1994). Additionally, as lexical aspect has rarely been researched in relation to Behaviours specifically, this study has provided a new perspective of an activity or semelfactive inherent meaning.

Although no trends were found in the polysemy of semantic verb groups, Behavioural verbs in general had low polysemy, suggesting that this category has a relatively fixed semantic and grammatical nature. A smaller number of verbs did have greater polysemy, which was linked to an increased divergence in the verbal semantics and syntax and therefore less clear-cut boundaries of this intransitive group.

Whilst we have gained a clearer sense of typical Behavioural verbs and made a case for an established Behaviours category, the outer boundaries of the category are less clear, including how these lexico-grammatical features of Behaviours might differ from other events and experiences that are represented intransitively. Specifically, we might consider how Behaviours differ from intransitive action events, or intransitive material processes within SFL.

The overlaps of these two groups were touched on In section 2.2.1, but what remains to be done in order to confidently describe the verb category of Behaviours is to examine the extent to which it is distinct from other intransitive verb classes. Thus, the following chapter aims to address this question by presenting the second study of this thesis, namely the Intransitive Actions (IA) study.

4. A comparison of the lexico-grammatical properties of Behaviours and Intransitive Actions

We saw in the previous study evidence for a Behaviours category, but this was based on a study of typical Behaviour verbs. Consequently, the outer boundaries of this category were not determined. In particular, literature has shown similarities between Behaviours and what are labelled 'Intransitive Action' events in this thesis – in Systemic Functional Linguistics, this boundary concerns the similarities in behavioural and intransitive material processes (see sections 2.2.1 and 3.1.1). Semantically, Behaviours and Intransitive Actions can both express physicality of an experience and grammatically; there are no explicit features in the literature that distinguish the two: neither take a *that*-complement, they both favour the present progressive form in the present tense, and Behaviours are also typically intransitive. Given their reported similarities in the literature, the study presented here – which I shall refer to as the 'Intransitive Actions (IA)' study – compares Behaviours to Intransitive Actions. The aim of this study is to examine whether Behaviours can be empirically differentiated from Intransitive Actions (another type of 'pure' intransitive category).

The structure of this chapter is as follows: section 4.1 reconsiders pure intransitives as a set and considers similarities of other pure intransitive verb classes in relation to Behaviours, in particular, what I have called Intransitive Actions. Section 4.2 then situates Behaviours and Intransitive Actions in the literature, addressing their similarities and potential crossovers in their categorisation. This section motivates the need for addressing the two pure intransitive categories, and introduces the sub-aims that are identified to achieve the overall aim of this IA study (section 4.2.3). In section 4.3, I outline the methodology used to compare Behaviours and Intransitive Actions in this IA study. The methods are largely replicated from the Behaviours study in Chapter 3, with the addition of statistical analyses to compare the two categories. The Corpus Pattern Analysis (Hanks 2004) results in section 4.4 reveal the grammatical and semantic nature of each verb, whilst the results in section 4.5 statistically compare each lexico-grammatical feature between the two verb categories. The collective features of the two categories are explored in section 4.6. Finally, section 4.7 concludes this IA study and motivates the third and final study, namely the broader 'Intransitive' study, which is presented in Chapter 5.

4.1 Another look at pure intransitive categories

So far in this thesis we have explored the nature of the Behaviours verb category, which represent one type of pure intransitives. However, the pure intransitive structure is not exclusive to Behaviours but is used for other meanings. In general, pure intransitives involve a heterogenous semantic group of verbs. Their meanings are classified in various ways, for example the widely researched 'motion verbs' such as *walking* etc., (cf Levin 1993; Kersten 1998; Talmy 2000; Slobin 2004; Beavers et al. 2010; Rappaport Hovav and Levin 2010; Aurnague 2011; Drăgan 2011; Huber 2017 to name a few). Insights show us how motion is linguistically encoded in typical intransitive action experiences such as *walking, running,* etc., where the subject is also typically animate (Levin 1993, p.266). Another class includes 'weather verbs' such as *it's raining*, though these will not be addressed here as they are "lexically or grammatically quite distinct" (Langacker 1991, p.365) and there has been "continuing controversy" about their ergativity status (cf Levin and Krejci 2019). Pure intransitives exclude ergatives i.e., the set of intransitives that have transitive counterparts (O'Grady 1980, p.57; Davidse 2011) (see section 2.1.1). For example, a typical ergative pair is *the ice melted* and *the sun melted the ice*, compared to the pure intransitive *I sneezed* (appendix one, line 421).

Having established some features of Behaviours in Chapter 3, the question arises as to whether there are differences in these features amongst other pure intransitives. One obvious set of pure intransitives to explore is the intransitive material process in the theory of Systemic Functional Linguistics (SFL), which are briefly described as doings and happenings such as *he went running* or *she is working*. As established in the previous chapter, the Behaviours category is largely representative of behavioural processes, though my classification of Behaviours excludes two features: the ability to report speech and volition (see section 1.3.1 for more detail). We saw in section 2.2 that neither behavioural or material processes occur with *that-*complement attachments (Halliday 1994, p.115), such as *she demolished that the earth was flat* (Halliday and Matthiessen 1999, p.135). They both occur in progressive aspect in the simple present tense, though note that for materials, cases in the simple present tense are said to be marked. For example, *he runs* represents a hobby in a habitual sense (Halliday 1994, p.116). The only major difference between material processes and behavioural ones in SFL is that material clauses tend to be transitive with two participants (Actor and Goal). However, material processes can also be single participant processes expressed by an intransitive clause.

Bloor and Bloor (2004, p.111) describe intransitivity of these action processes in terms of a lack of extension to second participants; in reference to the example in (165), they state that "the process realised by the verb *returned* is not extended from the actor *he* to any other entity".

(165) Half an hour later he returned (Bloor and Bloor 2004, p.113)

However, it is particularly difficult to differentiate these intransitive materials from behaviourals (we shall return to this in section 4.2.1). For example, there are no clear lexico-grammatical features that distinguish example (165) from behaviourals, as shown in example (166). Both examples are intransitive, have an animate subject, and occur with an adjunct (a circumstance of location in SFL terms).

(166) Somebody hiccupped 200 feet away (appendix one, line 155)

Sometimes a second role materialises for both behavioural and intransitive materials (as we saw with Behaviours in example (167)). This role is labelled differently by different linguists, such as 'scope' (for materials) (Halliday and Matthiessen 2014, pp.236–242) 'range' (Bloor and Bloor 2004, p.116), 'adverbial objects' (Sweet 1891, p.91) or a type of cognate object construction (see section 2.1.3), but generally it is considered a type of complement that is not a direct or indirect object.

(167) Judar laughed that coarse laugh of his (appendix one, line 306)

In terms of semantics, materials construe activities of doing and happening, which denote a change in a flow of events by an energy source (Halliday and Matthiessen 2014, p.224). As Halliday (1994, p.111) points out, these experiences "are not necessarily concrete physical events", but can be more "abstract" (see example (168)), which can blur the lines between the semantics of materials and behavioural (as we shall return to in section 4.2.1). Note that all the material process examples in this section have had animate subjects, which is another typical feature of behaviourals, as also validated in the Behaviours study.

(168) The mayor resigned (Halliday 1994, p.111)

Having established lexico-grammatical and semantic features of Behaviours in the previous chapter, this chapter will examine whether Behaviours are sufficiently different enough to be distinguished from intransitive material processes. Though the description of intransitive material processes is situated within the theory of SFL, this set of pure intransitives can be

applied to other classifications. Thus, intransitive material processes will be referred to as Intransitive Actions, which allows us to broaden the subject of study to include classifications from outside SFL but also to clearly label these verb types. Section 4.2 continues this review by comparing Intransitive Actions in relation to Behaviours across various approaches.

4.2 Situating Behaviours and Intransitive Actions within the literature

This section situates Behaviours and Intransitive Actions in the literature and reveals their similarities in classification. These similarities are most apparent in Systemic Functional Linguistics (SFL), in which there lack differences in the lexico-grammatical features of the two verbal groups and the difference mainly lies in the semantics (see section 4.2.1). Similarities of Behaviours and Intransitive Actions are also drawn from other verbal classification approaches (see section 4.2.2), where they are often grouped together in the same category (Levin 1993; Sorace 2000; Leech 2004; van Gelderen 2018), such as Levin's 'correspond verbs'. This review motivates the need for further investigation into the two categories, and the aims of this IA study are provided in section 4.2.3.

4.2.1   Behaviours and Intransitive Actions within Systemic Functional Linguistics

As established above, Behaviours represent the behavioural process and Intransitive Actions represent the intransitive material process type within the theory of SFL (Halliday 1985), besides a few exclusions (see sections 1.3.1 for Behaviours and 4.1 for Intransitive Actions).

As section 3.1 outlined, there are borderline cases to linguistic categorisation generally and this is true for SFL. Whilst certain instances are easy to classify and fit neatly into one of six process types, others are not always straight forward and difficulties arise in classification (Thompson 2015, p.29). Indeterminacy is a common cause of ambiguous classification (Halliday and Matthiessen 1999, p.547), especially when an instance 'overlaps' features of different process types. Behavioural processes are especially troublesome in classification as they "form a rather indistinct category" (Slobi 1997) and their criteria overlap with other categories (Halliday 1994, p.139). In particular, the behavioural process is "more like material processes than any other process type" (Fontaine 2013, p.90) as they have similar syntactic properties. The material process as the most diverse category also means that it is difficult to decide whether certain instances are material or something else (Thompson 2014, p.120). The literature seems to be lacking in any reliable lexico-grammatical features that distinguish behavioural processes

from material processes that are intransitive i.e., neither take a *that*-complement, they both typically occur in the progressive form in the unmarked tense, and behaviourals are typically intransitive. The lack of reliable features is highlighted by Halliday and Matthiessen's (2014, p.333) examples of material (see Figure 4-1) and behavioural (see Figure 4-2) process types (repeated from Figure 1-1 and Figure 1-2 respectively). Figure 4-1 and Figure 4-2 display one participant (animate), intransitive processes with circumstances, and therefore it is difficult to see why *dance* in Figure 4-2 is behavioural yet *jump* in Figure 4-1 is not.

The two creatures	had been jumping about	like mad things	all this time
Actor	**Process: material**	**Manner: comparison**	**Extent: temporal**

Figure 4-1: An example of an intransitive material process in Halliday and Matthiessen (2014, p.333)

We	can dance	without lobsters
Behaver	**Process: behavioural**	**Accompaniment: comitative**

Figure 4-2: An example of a behavioural process in Halliday and Matthiessen (2014, p.333)

The main difference between the material and behavioural processes lies in the semantics, where intransitive material processes represent physical actions or happenings (such as *running* or *climbing*; Halliday and Matthiessen 2014, p.224) and behavioural processes represent the outer manifestations of inner conscious states (such as *coughing* or *laughing*; Halliday and Matthiessen 2014, p.215), but even these can be difficult to distinguish. For example, certain researchers analyse experiences such as *dancing* as behavioural (Halliday 1994; Martin et al. 1997; Halliday and Matthiessen 2004), perhaps owing to their portrayal of "bodily postures and pastimes" (Halliday 1994, p.139), yet others claim them as material processes (Eggins 1994; Thompson 1996), as they are undoubtedly "action-oriented" (Thompson 1996, p.100). Other potential borderline cases of categorisation include experiences such as *singing, fighting, swimming, hiding, playing, dressing, stretching* etc., (Banks 2015). Certain experiences are considered by some as fitting into both categories, such as *sing a song* and *have a swim* (Bloor and Bloor 2004, p.126)*, which raises the question for the necessity of two separate categories. However, relying on the semantics of the clause alone is not enough to distinguish process types in SFL as "these goings-on are sorted out in the grammar of the clause" (Halliday 1994, p.106). As Bartlett (2014, p.49) points out, grammatical probes are necessary for distinguishing between process types.

Whilst behavioural processes typically have animate or sensate subjects (Martin et al. 1997; Halliday and Matthiessen 1999; Eggins 2004; Bartlett 2014; Halliday and Matthiessen 2014), as was suggestive of the high frequency of animate subjects (98.2%) in the Behaviours study (in Chapter 3), intransitive material clauses can have inanimate participants. Though, these intransitive materials with inanimate subjects are frequently in ergative clauses, such as *the ice melted*, and it is less clear how often pure intransitive materials can have inanimate subjects. As a reminder, intransitive ergative clauses have transitive counterparts (see section 2.1.1). One question that arises is what differentiates pure intransitive materials with animate subjects, such as *jumping* (see Figure 4-1), *running* etc., from behaviourals. We have already seen above overlaps and ambiguities in decisions between those experiences such as *dancing* (see Figure 4-2), *swimming* or *singing* and therefore differences between the two categories are evidently unclear.

Interestingly, Bloor and Bloor (2004, p.126) even outline two behavioural processes with inanimate first participants (see examples (169) and (170)), which is surprising considering behavioural processes typically involve animate Behavers.

(169) the car slid away (Bloor and Bloor 2004, p.126)
(170) its police department licence plate vanishing around the corner (ibid)

The example in (169) involves the inanimate participant *the car* and is described as a potential behavioural process as well as potential material process. Example (170) is described as "a more straightforward example" of a behavioural process (Bloor and Bloor 2004, p.126) and also has an inanimate participant – *its police department license plate*. One thought prior to investigation is that behavioural and intransitive material experiences that require an animate first participant might be better off combined, potentially in the behavioural category, and those with inanimate participants in the material category. Animacy is considered later in this chapter (see section 4.5.1) and discussed in more detail in the Chapter 5 (see in particular section 5.4.2).

One final cross-over in behavioural and intransitive material processes occurs with the notion of volition. We saw in Chapters 1 and 3 that volition was not considered as a classifying feature of Behaviours because of the current confusion in the literature, though it is worth briefly addressing the ambiguities concerning volition in SFL to highlight difficulties that arise in classifications. SFL literature suggests that material processes are typically voluntary (Downing and Locke 2006, p.128), whilst behavioural processes are typically involuntary

(ibid, p.152). However, this is not conclusive. For example, (as outlined in section 3.1) volition is a feature in behavioural perception processes – such as *listening* – that distinguishes them from involuntary mental process – such as *hearing.* Voluntary behavioural processes are also outlined, such as *coughing* or *laughing* with agency (Downing and Locke 2006, p.152; Banks 2015, p.24). To add to this, Halliday (1994, p.111) highlights the ability for material processes to be involuntary, as shown in example (171).

(171) The tourist collapsed (Halliday 1994, p.111)

Example (171) represents an involuntary happening rather than a doing, and is considered a "more abstract" event in a material process (Halliday 1994, p.111). Though, we might also question why Halliday does not consider example (171) as a behavioural process, considering the pure intransitive nature with an animate subject. Halliday's classification of *collapse* contradicts the claims that Behavioural processes are involuntary and material processes are voluntary (Downing and Locke 2006), highlighting discrepancies in classification.

As we saw in section 3.1.1, other SFL accounts sometimes place behavioural processes with material processes (cf Fawcett 2000; Neale 2002; Banks 2015; Bartley 2017). For example, Fawcett (2000) and Banks (2015) both propose systems that distribute behavioural processes into subtypes of material, mental and verbal processes (note Fawcett uses the term "action" instead of material). Fawcett's model includes most behaviourals under 'one-role affected-only action' processes (material is re-named to 'action' in Cardiff Grammar), such as *chatting* and *fighting* (Neale 2002, p.111). Banks (2015) proposes 'material action' and 'material event' processes, in which behaviourals are included. For example, Banks (2015, p.37) claims that whilst the typical behaviour *smiling* is indicative of a mental state, it "is an action that takes place in the physical world" and therefore is "basically a verb of material process". Additionally, Matthiessen (1995, p.251) states that behavioural processes "are treated as a sub-type of material processes", highlighting the similarities of the two. Though, to the best of my knowledge, these alternative classifications are theoretically driven rather than based on empirical evidence. Thus, it is considered worthwhile to empirically establish their lexico-grammatical features to determine whether any properties can be found to distinguish the two categories. Now this section has provided a review of Behaviours and Intransitive Actions in SFL, section 4.2.2 turns to the similarities between these two categories in alternative verbal classifications at the lexico-grammatical interface (Levin 1993; Sorace 2000), as well as in

relation to grammatical aspect (Leech 2004) and lexical aspect (Tenny 1987; Rappaport Hovav and Levin 1998a; Halliday and Matthiessen 1999; van Gelderen 2019).

4.2.2 Behaviours and Intransitive Actions in other theories of verbal semantics and classification

Whilst SFL has similarities in behavioural and intransitive material processes, Behavioural and Intransitive Action verbs are often grouped together in other literature. In this section, we will firstly consider how Behaviours and Intransitive Actions are classified in Levin's (1993) volume of English verb classes and alternations, which we have already done so with Behaviours alone (see sections 2.3.1 and 3.1.3). The overlaps of the two verb categories will then be explored in Sorace's (2000) categorisation of intransitive verbs, followed by Leech's (2004, p.18) consideration of verbs in relation to progressive aspect. Finally, Behaviours and Intransitive Actions will be situated in relation to literature on lexical aspect (Tenny 1987; Rappaport Hovav and Levin 1998a; Halliday and Matthiessen 1999; van Gelderen 2019).

Semantic classifications do not often differentiate Behaviours and Intransitive Actions, for example similarities of these two categories are found in Levin's (1993) volume of English verb classes and alternations. Several Behavioural or Intransitive Action experiences have similar grammatical structure under the same alternation, and certain verbs are classified with similar semantic meaning under the same verb class, which highlights why it can be difficult to distinguish between the two categories.

Behavioural and Intransitive Action verbs both occur in alternations such as the 'cognate object', 'locative inversion', 'simple reciprocal (intransitive)', 'with preposition drop', 'swarm alternation', 'benefactive alternation' and 'understood reciprocal object' alternation (cf. Levin 1993, pp.36-95). Owing to space constraints, the 'understood reciprocal object' alternation will be outlined as an example here. In the intransitive variant of this alternation, the subject is a collective noun phrase, and each participant in the collective "must be of comparable status" (ibid, p.36) – they must both be animate and able to participate in the activity (see example (172)).

(172) Ellen and Helen chitchatted (Levin 1993, p.36)

Both Behavioural verbs (such as *gossiping* and *chatting*) and Intransitive Action verbs (such as *competing*), as well as those borderline to both (such as *playing*) occur in the understood reciprocal object alternation (ibid, p.36), which highlights the grammatical similarities of each category.

The semantic classification in Levin's (1993) verb classes is more clear cut when differentiating between Behaviours and Intransitive Actions. As we have seen, Levin's classification takes a more semantic perspective than SFL's consideration with the experiential clause (see section 2.3). Behaviours tend to be expressed in certain types of verb classes, such as 'verbs of bodily processes', 'verbs of manner of speaking' and 'peer verbs', whilst Intransitive Actions more typically represent 'run', 'meander', and 'meet' verbs. There are however still cases of similarities and crossover between the two. For example, the 'correspond verbs' set includes Intransitive Action verbs, such as *competing* and *conflicting*, and also Behavioural verbs, such as *communicating* and *flirting*. The verb class of 'exit verbs' includes experiences that seem borderline to both the Behaviours and Intransitive Actions. For example, experiences of *waiting* and *living* arguably represent a kind of behavioural attribute but also a physical happening. Thus, there are clear overlaps in Levin's classification of Behavioural and Intransitive Action verbs.

Similarly, there are overlaps in the classification of Behaviours and Intransitive Actions within Sorace's (2000) work. Sorace (2000) categorises intransitive verbs in terms of their auxiliary selection in Western European Languages and outlines seven intransitive verb classes on the gradient: 'change of location'; 'change of state'; 'continuation of a pre-existing state'; 'existence of state'; 'uncontrolled process'; 'controlled process (motional)'; and 'controlled process (non-motional)'. The controlled (non-motional) group typically shows the main crossover as it includes processes such as *work*, *play* (Intransitive Actions) and *talk* (Behaviour). These processes tend to be agentive, durative, and do not affect the "entity in control" (Sorace 2000, p.874). The controlled (motional) group tends to include Intransitive Actions, such as *run, swim* and *walk*, and are described as verbs of manner of motion. Though, we have seen from sections 4.2.1 and 3.1.2 that *swimming* is sometimes grouped with other Behavioural verbs (Bloor and Bloor 2004; Langacker 2008) and therefore certain linguists might class certain experiences in this group under Behaviours. The subject of controlled motional processes is said to be "affected more than with non-motional processes" as they are often volitional and experience some kind of change in location (Sorace 2000, p.875). In terms

of aspectual structure, these verbs are more homogenous than controlled non-motional processes, such as the series of strokes in *swimming*. Section 2.2.2 showed that many obsolete intransitive verbs were uncontrolled processes which often represented Behaviours, such as *giscian* (sob) (van Gelderen 2018). Included in van Gelderen's research on these intransitives were also controlled processes that represent Intransitive Actions, such as *aleoran* (flee), *cneowian* (kneel down) and *firdian* (march) (van Gelderen 2018, pp.58–59).

As an alternative classification, Leech (2004, p.18) outlines 10 classes of verbs that typically occur in progressive aspect: 'momentary verbs'; 'transitional event verbs'; 'activity verbs'; 'process verbs'; 'verbs normally incompatible with the progressive'; 'verbs of inert perception'; 'verbs of inert cognition'; 'verbs of attitude'; 'state verbs of having and being'; and 'verbs of bodily sensation'. Several of these classes include verbs that typically represent Behaviours and Intransitive Actions. For example, Behaviours such as *hiccoughing* and *winking* and Intransitive Actions such as *jumping* and *knocking,* as well as borderline cases such as *nodding* are included in the Momentary verbs class. Momentary verbs are defined as those that indicate a series of events that express repeated movements (Leech 2004, p.24). Similarly, Intransitive Actions such as *running* and *working* and Behaviours such as *talking* are included in activity verbs, which are said to "tell us something is 'going on'" despite not all explicitly representing "human occupations" (Leech 2004, p.24). Overall, both the semantics and grammar of these verbs are outlined as similar, from their classification into the same verb classes (semantics) as well as their denotation of occurring progressively (grammar). The semantic classification relates to lexical aspect, where the situation type of the momentary verb class would likely be semelfactive and the situation type of the activity class would likely be activity (as shown in section 2.4, these are two of the five situation types that represent the inherent temporal meaning of a given instance). However, the links between verb class and situation types suggested here are only predictions, because a given instance is what is analysed, and attributing one situation type to whole verbal groups is too much of a generalization, missing important features such as adverbials.

Behaviours and Intransitive Actions are shown to be aspectually similar in other literature (Tenny 1987; Rappaport Hovav and Levin 1998a; Halliday and Matthiessen 1999; van Gelderen 2019). For example, Rappaport Hovav and Levin (1998a, p.108) class manner verbs as activities, such as *running* (Intransitive Action) and *whistling* (Behaviour). As shown in section 2.4, activities are dynamic and durative events that do not have an inherent end point.

SFL literature also classifies Behaviours (*listen*, *smile*) and Intransitive Actions (*walk*, *run*) as activities (Halliday and Matthiessen 1999, p.471). Similarly, van Gelderen (2019, p.220) states that uncontrolled processes (typically Behaviours), controlled motional processes (typically Intransitive Actions) and controlled unmotional processes (typically Behaviours or Intransitive Actions) are durative. Other research links unergative verbs, which typically include Behaviours and Intransitive Actions, to atelicity (Tenny 1987, p.264; Dowty 1991; van Gelderen 2018, p.10). As a reminder, unergatives are syntactically like pure intransitives as they do not have an underlying object that can move into subject position (see section 2.1.1). Thus, literature outlines similar lexical aspect features of verbal categories that include Behaviours and Intransitive Actions, suggesting that these two categories have similar inherent temporal meaning.

4.2.3 Summarising the Behaviours and Intransitive Actions review and motivating this IA study

So far, this chapter has situated Behaviours and Intransitive Actions within verbal classification literature and highlighted where some ambiguities may lie in determining differences between the two categories. A review of the literature has shown that within the theory of SFL, there lack any reliable lexico-grammatical features that distinguish Behaviours from Intransitive Actions, and for certain experiences there are even difficulties in classifying semantically. Research from other insights has also shown crossovers in verbal classification (Sorace 2000; Leech 2004) as well as in grammatical aspect (Leech 2004) and lexical aspect (Tenny 1987; Rappaport Hovav and Levin 1998a; Halliday and Matthiessen 1999; van Gelderen 2019). Thus, investigating the lexico-grammatical features of Behaviours and Intransitive Actions is useful for developing our understanding of the two categories. Similar to the justification in the Behaviours study (see Chapter 3), literature on these two categories is typically theoretically based and therefore using corpus linguistics would help to empirically establish (or disband) them as two separate categories.

Thus, the aims of this IA study is to examine whether Behaviours can be empirically differentiated from Intransitive Actions (another type of 'pure' intransitive category). Two sub-aims have been identified to help achieve the main aim of this study:

2.1. To empirically attest the theoretical claims about the lexico-grammatical features of Behaviours and Intransitive Actions.

2.2. To determine the extent to which Behaviours and Intransitive Actions can be differentiated.

The following section introduces the data and methods used to achieve the aims of this IA study.

4.3 Methodology for investigating Behaviours and Intransitive Actions

This section presents the methodology of this IA study. The methods are largely replicated from the Behaviours study presented in Chapter 3 and so only a summary will be provided here alongside any different steps that were taken in this study (though for full details see section 3.2). Section 4.3.1 establishes the data collection process of the Behaviours and Intransitive Actions. Section 4.3.2 outlines the analysis process, drawing on Corpus Pattern Analysis (Hanks 2004a) and aspectual analysis to investigate five lexico-grammatical features: intransitivity, first participant animacy, and *that*-complements in section 4.3.2.1 and grammatical aspect and lexical aspect in section 4.3.2.2. Section 4.3.2.3 presents the statistical analyses used to test for differences in the features between Behaviours and Intransitive Actions.

4.3.1 Data collection of Behaviours and Intransitive Actions

To build a dataset of Behaviours and Intransitive Actions, typical Behavioural and Intransitive Action verbs were selected for a corpus search in the Corpus of Contemporary American English (COCA; Davies 2008-) (see section 3.2.1 for justifications of this corpus). For the Behaviours, five verbs were selected from those presented in the Behaviours study (in Chapter 3). In this previous study, 15 verbs that typically represent Behaviours were divided equally between five semantic groups, resulting in three per semantic group; *look, stare* and *listen* as psychological perception behaviours, *ponder, ruminate* and *meditate* as psychological cognition behaviours, *frown, laugh* and *cry* as physiological emotion behaviours, *hiccup, shiver* and *sneeze* as other physiological behaviours, and *talk, converse* and *gossip* as communicative behaviours. The five most prototypical verbs of the Behaviours category were selected for this IA study: *sneeze, converse, frown, meditate* and *stare* (according to the prototypicality evaluation in section 3.4). These verbs also represent each semantic sub-category.

A list of Intransitive Action verbs was compiled using the criteria outlined in relation to intransitive material processes in SFL (see sections 4.1 and 4.2.1), which is summarised here for clarity. Firstly, as the name suggests, Intransitive Actions are expressed in intransitive constructions and so they do not have a direct object and cannot be made passive. Intransitive actions typically occur in the present progressive form in the unmarked tense, and do not occur with *that*-complements (Halliday 1994, pp.115–116). Semantically they represent doings and happenings that denote a change in a flow of events by an energy source. Subject animacy was also taken into consideration; as Behaviours generally have an animate subject, Intransitive Actions that typically have animate subjects were selected to compare any differences between the two verb categories. For example, it was of interest to identify whether the one category occurred more frequently with animate subjects, and if there is evidence to justify separate categories. Taking these criteria into account, the list of Intransitive Action verbs was also compiled using a variety of literature. Examples of intransitive material process verbs in SFL textbooks were used (Downing and Locke 2006; Fontaine 2013; Bartlett 2014, p.52; Halliday and Matthiessen 2014; Thompson 2014, p.110), as Intransitive Actions reflect these process types (see section 4.1). Some verbs were identified using The Valency Patterns Leipzig Online Database (VALPAL; Hartmann et al. 2013), a useful database in revealing intransitive clauses that represent different meanings, including actions. For example, the coding frame 'NP-nom V.subj' with the argument type 'S' included Intransitive Actions such as *running, jumping* and *climbing*. Finally, the COBUILD (Francis et al. 1996) and Levin's (1993) verb classes were also used for this verb selection process. It is worth noting that determining which verbs should be listed as either a Behaviour or Intransitive Action is an awkward and ambiguous process; the problem presented here is that there is not a clear distinction between these categories.

Verbs that were difficult to categorise as either Behaviours or Intransitive Actions (i.e., borderline cases) were excluded from the Intransitive Actions list, to obtain verbs that are most representative of the category. In particular, some verbs from Banks' (2015, pp.28–33) list of "potential behavioural verbs" semantically represented physical actions more closely than behavioural experiences and differences have been found amongst researchers. For example, Banks (2015, p.31) shows that *playing* is presented as a behavioural process in two SFL textbooks (Matthiessen 1995; Martin et al. 1997), though other literature classify it as a material process (Bloor and Bloor 2004; Fontaine 2013). In total, 21 verbs were excluded, such as *playing*, *dancing* and *swimming*.

Overall, 23 verbs were listed as Intransitive Actions. Five verbs were selected at random by numbering each verb and using a random number generator: *resign, jog, walk, compete* and *climb*. Sixty-one percent of verbs in the Intransitive Actions list were manner of motion verbs and therefore the proportion of motion verbs in this final sample (*jog*, *walk*, *climb*; 60%) was representative of the verb category in general. The final ten verbs selected for this IA study are displayed in Table 4-1.

Table 4-1: Ten verbs representing Behaviours or Intransitive Actions

Behaviours	Intransitive Actions
Sneeze	Resign
Converse	Jog
frown	Walk
Meditate	Compete
stare	Climb

A Key Word In Context (KWIC) search was carried out for each verb, with all forms of the lemma (see section 3.2.1.2 for details). A total of 250 concordance lines were obtained for each verb, which amounted to 1250 Behaviours and 1250 Intransitive Actions. Analysing 250 lines replicates Hanks' (2004a) Corpus Pattern Analysis method for developing the Pattern Dictionary of English Verbs (PDEV; 2014-), which he claims provides a representative sample of verb usage. Elsewhere, Hanks (2004a, p.91) also suggests a figure between 200-1000 will allow for a detailed analysis. The data for *sneeze, converse, frown, meditate*, and *stare* from the Behaviours study (30 concordances per verb) was used in this IA study, and therefore an additional 220 extra concordances were obtained for each of these Behaviours. The concordance lines were imported into Microsoft Excel and certain instances were excluded and replaced. Similar to the Behaviours study, only instances of the search verbs as the main verbs were selected (see section 3.2.1.3 for detail), which discounted catenative verbs – verbs that create 'chains' of verbs (Huddleston and Pullum 2002, p.65) and non-finite clauses. Non-finite occured in around 25% of instances. Any instances of tagging errors, where another part-of-speech was tagged as the target verb, were also omitted. These occurred in around 2.5% of the dataset. An example of an adjective tagged as the node is shown in (173).

(173) Jogging footsteps thudded on the wooden walkway (COCA FIC: A dangerous climate)

Specific to the verb *resign*, 8.4% of nodes in the collected data were mis-labelled as the verb *re-sign* (see example (174) and so these were replaced.

> (174) The Miami Heat re-signed free agent forward Shavlik Randolph (COCA NEWS: USA Today)

Finally, instances where *frown* and *sneeze* were used to quote speech were excluded (see example (175)), as these were too restricted in reporting and were not included as Behaviours (see section 3.2.1.3).

> (175) "So where'd they get you from?" Amara *frowned* (COCA FIC: Nocturnal)

4.3.2 Data analysis of Behaviours and Intransitive Actions dataset

The analysis in this IA study replicated the same process as in the Behaviours study (see section 3.2.2 for full detail); Corpus Pattern Analysis (CPA; Hanks 2004), followed by analysis of tense, mood, grammatical aspect and lexical aspect. Together, these analyses covered the five lexico-grammatical features investigated in this study: animacy, intransitivity, occurrence with *that*-complements (all addressed in CPA), grammatical aspect and lexical aspect. These features are the same five lexico-grammatical features that were investigated in the Behaviours study in Chapter 3, and they were chosen because, according to current literature, Behaviours and Intransitive Actions display similarities in these properties. Both categories are intransitive, do not occur with *that*-complements and have similar grammatical aspect. As we saw in section 3.2.2, grammatical aspect was investigated as a feature in order to identify progressive forms as well as to provide a deeper analysis of the temporal nature (Bache 2008, p.39) such as habituality or iterativity. Subject animacy and lexical aspect were also investigated to identify any similarities or differences in these features across the two categories. Section 4.2.2 has drawn on literature that indicates the similarities in the lexical aspect of Behaviours and Intransitive Actions, though this is not abundant and a direct link between lexical aspect and the two verbal categories is not yet grounded in the literature. Investigating all five of these lexico-grammatical features using corpus data empirically attests whether they are established features of either category and contribute to our general understanding of them.

The manual analysis was carried out using Microsoft Excel with the date, genre, domain, concordance lines, and each lexico-grammatical feature in a separate column. This data analysis is presented in appendix two, which shall be referenced from here out to support the

explanations of data analysis below, as well as the results (in section 4.5). Statistical analyses were implemented in this study using 'R' software (RCore Team 2021) to directly compare Behaviours and Intransitive Actions, which involved effect size tests, tests of difference, binary decision trees and hierarchal clustering. The following sections remind the reader of the initial analysis process, including CPA (see section 4.3.2.1) and aspectual analysis (see section 4.3.2.2). Finally, section 4.3.2.3 introduces, describes and justifies the specific statistical analyses.

4.3.2.1 Recap of Hanks' (2004) Corpus Pattern Analysis

Each concordance line in the dataset was analysed using Hank's (2004a) Corpus Pattern Analysis (CPA), an approach that reveals how meaning is mapped onto words in text (Hanks 2004a, p.87). In CPA, patterns of individual words are developed according to their syntactic structure and each pattern is given an associated meaning or 'implicature'.

For each concordance in this analysis, semantic types were attributed to the participant roles or valence around the verb – as shown in section 3.2.2.2, a semantic type "is a class to which a term can be assigned" (Hanks and Pustejovsky 2005, p.1). This research involved two levels of pattern analysis – the general participant animacy (inanimate or animate) and a more specific semantic type. This first level of patterning identified the subject animacy feature investigated in this study, for example *[[animate participant]] V* represented *I sneezed* (appendix two, line one). In cases of metonymy, when "one entity is used to refer to another entity that is associated with it in some way" (Hurford et al. 2007, p.339), the animacy of the participant being referred to was analysed (see section 3.2.2.1). For example, the participant *[[institution]]* represented the people who worked for these semantic types and was analysed as animate. The second level of patterning involved specific semantic types, such as *[[human]] V* representing *I sneezed* (appendix two, line one). The semantic type database sometimes lacked classification for certain participants, and in these instances semantic types were developed, such as *[[planet]]* (see pattern 4 in section 4.4.2.5).

Adjuncts were analysed in the same way as they were in section 3.2.2.1 – if an adjunct occurred in over 60% of concordances, then it was included in the pattern. Adjunct labels from CPA included: direction, location, manner, time point or time period, such as *human stared (direction)* (see section 3.3). Halliday and Matthiessen's (2014, pp.313–314) circumstantial adjunct labels were used to supplement where necessary (see Table 3-2).

In terms of transitivity complementation, a separate column was used to note the transitivity. Any *that*-complement was identified using CPA, which uses the label *THAT-*. As with the Behaviours study, transitive phrasal verbs were recognised by the alternations V+Particle+NP and V+NP+Particle, where a direct object can occur between the phrasal verb units or after the phrasal verb (Aarts 2013, p.189) (see example (176)).

(176) a) Andrew stares down Clemens *(appendix two, line 1195)*
b) Andrews stares Clemens down

Transitive prepositional verbs were recognised by their structure V+NP+PP, where there is no alternation between the NP and PP (Aarts 2013, pp.192–193). An example is displayed in (177).

(177) a) Bella walks Fran to her car (appendix two, line 1757)
b) *Bella walks to her car Fran

The fixed idiom in pattern 3 of *resign* (see section 4.4.2.1), *human/institution resigns reflexive to action/state_of_affairs*, was also analysed as a transitive prepositional verb. An example is displayed in (178).

(178) a) [He] has resigned himself to it (appendix two, line 1462)
b) *[He] has resigned to it himself

Likewise, the idioms in pattern 3 (*abstract_entity V human in the face*) and 4 (*eventuality=bad V human in the face*) of *stare* (see section 4.4.1.5)*,* were analysed as transitive prepositional verbs for the same reasons (see example (179)).

(179) who, as former presidential speechwriters themselves, might also have been expected to recognize literary distinction *when it was staring them in the face* (appendix two, line 1084)

We saw in section 2.1 that some verbs take alternative arguments to direct objects in the object slot and it can be difficult to determine whether these are intransitive or transitive constructions. In the dataset, this was typical of the motion verbs *walk, jog* and *climb.* The type of phrase was used to determine the transitivity; measure phrases in direct object slot (*the five miles from campus to her house* in example (180) cannot be made passive and were analysed as intransitive, whilst non-measure phrases can (*Taos mountain* in example (181)) and were analysed as transitive. Sometimes spatial deixis becomes blurred and is extended to other

linguistic domains (Saeed 2009, pp.194–5), and so certain non-measure phrases act like measure phrases. For example, in *walking home* (see example (182)), the physical space of *home* adopts a metaphorical shift that extends to a more measured domain, and therefore *home* behaves as a measure phrase. Instances like these were analysed as intransitive.

> (180) She routinely jogged the five miles from campus to her house (appendix two, line 1558)
> (181) [He] climbed Taos mountain (appendix two, line 2393)
> (182) and [she] walked home (appendix two, line 1844)

Finally, the transitivity of the caused-motion construction is not absolutely clear within the literature. Certain literature implies that it is transitive as it can be made passive in a derivational construction (Michaelis 2013, p.150) and takes a direct object (van Dam and Desai 2016). The construction has also been likened to the ditransitive construction with three core arguments (Timyam and Bergen 2010, p.137; Fong 2020, p.3), and the case has even been made that they are not constructions in English but "nonce formulations" (Kay 2013, p.42), where unconventionalised expressions are formed on analogy with other conventionalised examples. However, this debate is not in the scope of this research as their intransitivity is what is relevant, and they are evidently not intransitive uses. One instance of the caused-motion construction occurred in this dataset with the verb *sneeze – Navin sneezed blue pollen onto his shirt (appendix two, line 67)* (see discussion with Table 4-2 below). This construction was labelled as transitive, where the intransitive verb *sneeze* undergoes a valence augmentation and becomes a transitive use, with a direct object and the capacity to be passivized (Michaelis 2013, p.149).

Once all concordances were analysed, they were grouped depending on their argument structure and assigned a pattern number. As a reminder, the pattern formatting is as follows: semantic types are in double square brackets and alternative semantic types are differentiated with a disjunctive bar '|'; semantic roles are indicated with an '=' sign; numbers are used to classify semantic types if there are two or more of the same in a pattern; optional arguments are displayed in parentheses; braces (curly brackets) are used to either signify specific lexical items, or for phraseological groupings; and finally, patterns are expressed in the active voice. When five or more semantic types occurred in a single pattern, the semantic type was labelled in terms of animacy (*(in)animate / animate / inanimate participant*) to prevent patterns becoming too long.

Each pattern was assigned an implicature i.e., its meaning. Implicatures were predominantly established using Hanks' (2014-) PDEV – the PDEV is a resource developed using CPA, which reveals the relationship between meanings and patterns of verb use in English (see section 3.2). Definitions were supported using other sources based on verb structure and meaning, including the COBUILD (Francis et al. 1996), the Berkeley Framenet database (Baker et al. 1998) and Levin's (1993) verb classes and alternations. For example, *converse, walk, compete, resign* and *climb* do not yet have entries in the PDEV and so other sources were required to develop implicatures. In some cases, specific literature was also used to support definitions. For example, the pattern *[[natural_landscape_feature / physical_object]] jogs direction* (see section 4.4.2.2) which carried the implicature *natural_landscape_feature / physical_object has a line of course in a particular direction,* was developed using Levin (1993), but also supported by other literature (Talmy 2000; Hanks 2013). This pattern represents 'fictive motion', where motion is ascribed to a typically motionless participant and the lack of ability to move means it is conceptualised through a mental image (Talmy 2000).

The Oxford English Dictionary (OED) supported definitions where the previous sources were insufficient and finally context was sometimes used to determine pattern meanings such as collocational evidence. For example, there were differences in meanings of *Human walks* resulting in different patterns (see patterns 1,6,7 in results section 4.4.2.3). Pattern 6 of *walk* was in the context of someone 'getting off freely' in terms of a criminal charge. This pattern was developed using the OED and collocational evidence – *charges dropped* (appendix two, line 1966) and *still behind bars / he is serving longer now / murder convictions* (appendix two, line 1998; COCA:SPOK:NBC_Dateline). Pattern 7 of *walk* was jargon for baseball games, in terms of a batter automatically reaching first base, identified using the OED and collocational evidence – *he walked more than he struck out* (appendix two, line 1937), and *…that advanced the runners to second and third base / After Tony Eusebio struck out and Andujar Cedeno was intentionally walked* (appendix two, line 1780; COCA:NEWS:Houston Chronicle).

Finally, some, albeit rare, implicatures were generated purely through evidence such as collocational or alternative literature evidence. For example, the implicature for the caused-motion example in Table 4-2 was developed using Construction Grammar literature such as Goldberg (1995, p.9) and Boas (2013, pp.236–237). These constructions have 'fixed' meanings that represent the movement of participant two onto participant three by participant one (Goldberg 1995, p.9).

Table 4-2: Pattern 4 of the verb Sneeze

Concordance (appendix two, line 67)	*Navin sneezed blue pollen onto his shirt*
Pattern	[[human]] V [[particle]] onto [[cloth]]
Implicature	[[Human]] sneezes, causing [[plant_part]] to move to a particular location

4.3.2.2 Recap of the tense and aspect analysis

The tense and aspect analysis was replicated from the Behaviours study in Chapter 3 and therefore this section reminds the reader of general details, though see sections 2.4 and 3.2.2.2 for more detail. Tense and mood were also analysed because they interact with grammatical aspect.

Tense is defined as relating the time being referred to, to the time of orientation (Huddleston 1995; Declerck et al. 2006). Behaviours and Intransitive Actions verbs occur in the progressive *-ing* form in present tense, and therefore the tense of each instance was recorded in terms of past and present, to reveal the typical form in the present tense. Present tense was typically recognised by no morphological attachment on the stem verb, an *-s* suffix when referring to the third person, or the auxiliary *is* in the verb phrase. Past tense was recognised by the *-ed* suffix or the auxiliary *was* in the verb phrase. Future time markings (what some refer to as 'future tense', though this is much disputed) were identified by auxiliaries such as *will* and *shall.* Defining and recognising perfect tense / aspect is also much disputed in the literature, but these instances were regarded as perfect tense in this analysis, and recognised by *have + past participle* (Huddleston and Pullum 2005).

As stated above, a mood analysis was carried out. Mood was analysed in terms of the three mood structures 'declarative', 'interrogative' and 'imperative', which were identified by the interaction of the subject and finite operator in the verbal group (Halliday 1994, pp.42-48;71-87). Imperative clauses are tenseless and therefore could not be analysed for grammatical aspect.

Aspectual analysis was then carried out. Grammatical aspect was analysed in terms of perfectivity and imperfectivity, where perfective clauses are bounded and imperfective are unbounded. One identifying test of perfectivity was the ability to take adverbs of repetitive construal (Langacker 1990, p.88). Imperfective situations are either stative through time – simply labelled 'imperfective' – or focus on the beginning, middle or end of a situation – labelled 'imperfective egressive', 'imperfective progressive', or 'imperfective egressive' respectively. Instances in this dataset were either 'perfective', 'imperfective' or 'imperfective progressive', and the imperfective progressive instances were identified by the form *auxiliary be V-ing* (Van Rompaey 2013, p.193). Both habituality and iterativity were also analysed as part of the grammatical aspect, which occur simultaneously with (im)perfectivity. Habituality concerns characteristics over a long time period (Comrie 1976, p.30) and was identified from frequency adverbs (see example (183)), durative time adverbials (see example (184)), and context (see example (185)).

(183) *Usually* she jogged alone (appendix two, line 1699)
(184) Has climbed steadily for nearly twenty years (appendix two, line 2253)
(185) I jog in the *mornings* (appendix two, line 1591)

Iterativity concerns the repetitiveness of an event, and was identifiable from repetitive adverbs (see example (186)), frequency adverbs (see example (187)), or a plural/collective subject with a non-progressive form (Declerck et al. 2006, p.36), as in example (188).

(186) he sneezes repeatedly as he waits to board the red-eye to Atlanta (appendix two, line 34)
(187) Sometimes they converse so loudly… (appendix two, line 256)
(188) …approximately 60 employees at Redskins Park have resigned (appendix two, line 1439)

The lexical aspect analysis involved the identification of five main situation types – activity, semelfactive, accomplishment, culmination and state – and their identification was based on key research including Vendler (1957), Smith (1991), Rothstein (2004b), Declerck et al. (2006) and Van Rompaey (2013, pp.181–219). These five situation types were coded in the same way as in the Behaviours study, which were dependent on the following six features: dynamic or stative; durative or punctual; transitional or non-transitional; evolving or non-evolving; telic or non-telic; and agentive or non-agentive. As a quick recap, activities are dynamic (there is a change in the situation), durative (lasting in time), atelic (no inherent end point) and agentive (the situation is performed by an agent or instigator). States are stative (non-dynamic), non-agentive and atelic. Accomplishments are similar to activities but are telic instead of atelic and

therefore have an inherent endpoint. Culminations are dynamic agentive, and punctual (instantaneous). They are also transitional (a sub-type of punctuality) because the situations have preliminary stages leading up to the culmination point. Finally, semelfactives are similar to culminations but differ in that they are non-transitional.

The features that make up each situation type were identified according to several tests. These have been outlined in detail section 3.2.2.2, but a select few will be exemplified here to show how situation types were identified for the dataset in this IA study. Dynamicity was identified by the *do* test – allowing periphrasis with *do* (Smith 1991, p.68) – as well as adjuncts of manner (see example (189)).

(189) I jog *quickly* to the back of the partnering line (appendix two, line 1639)

States were typically recognised by the semantic types of the pattern and the pattern implicature. For example, the pattern *[[natural_landscape_feature / physical_object]] jogs direction* (see section 4.4.2.2) had inanimate first participants and the implicature *natural_landscape_feature / physical_object has a line of course in a particular direction,* which were indicative of fictive motion and therefore a state. An example is shown in (190).

(190) The road jogged to the south (appendix two, line 1533)

Agentive instances were identified by imperative tests or the instance already occurring in the imperative form (see example (191)), as well as their compatibility with verbs such as to force and to persuade (Dowty 1979, p.55; Van Rompaey 2013, p.207).

(191) Meditate for at least 20 minutes to reduce stress (appendix two, line 897)

Durative events were compatible with *stop* complements as well as adverbs of duration (shown above in example (191)). There are some exceptions to the durativity tests, as they can occur with punctual situations when the event is a series of a single action, such as *sneezing* (Van Rompaey 2013, p.199). These series of events were indicative of non-transitional punctual events. Transitional punctual events were identified by their preliminary stages, either taken from the context or general knowledge of events and happenings (see example (192)).

(192) After Clark resigned under pressure in 1999… (appendix two, line 1346)

No instances were analysed as evolving (expressing a gradual change) because Behaviours or Intransitive Actions do not represent these verb types (*improve, widen*) or this temporal meaning. Finally, telic events (with inherent endpoints) were identified by several tests, such as directional prepositional phrases headed by *to* (Dowty 1979), durative adverbials and completive complements (*to finish* or *to complete*) – see below for examples of analysis. As outlined above, these aspectual features all contributed to the situation type of each instance. An example of a coding instance is displayed in Table 4-3.

<div align="center">

Table 4-3:An example of lexical aspect coding for one instance of climb

</div>

Concordance line	Dynamic/ Stative	Durativity/ Punctual	Transitionality/ Non-transitional	Telic/ atelic	Agentive/ Non-agentive
They climbed into a car (COCA: BK:DarkMatter)	Dynamic	Durative	N/A	Telic	agentive

Whilst most of the data analysis was straightforward with the help of aspectual tests, certain instances were more difficult to analyse. These ambiguous instances and the solutions used to identify the situation types are outlined here. Firstly, there was ambiguity in distinguishing between activities and accomplishments in the pattern *[[human]] climbs [[natural_landscape_feature / physical_object]]* (see results section 4.4.2.5), because it was not always clear whether there was an inherent endpoint to the situation. As noted above, telicity is the distinguishing factor between activities (atelic) and accomplishments (telic). One identifier of telicity involved adding a completive duration adverbial (see example (193)).

(193) a) They climbed the stairs (appendix two, line 2373)
       b) They climbed the stairs *in one hour*

The second test involved adding the complements *to finish* or *to complete* (Van Rompaey 2013, p.203). An example is displayed in (194).

(194) They *finished* climbing the stairs

Finally, in telic events there tends to be a determiner with the noun phrase (i.e. *a* or *the*). The noun phrase the stairs in examples (193) and (194) has a determiner, indicating a telic event.

Similarly, there were some unclear cases in the telicity of the pattern *[[animal_1 / human_1 / human_group / institution_1 / plant_1]] competes (with / against [[animal_2 / human_2 / institution_2 / plant_2]] (for [[abstract_entity]]) (in / at [[event]])* (see section 4.4.2.4). Identifying an inherent endpoint was particularly ambiguous when a competition was occurring for an extended period (see example (195)). The instance in (195) was analysed as telic and therefore an accomplishment for the following reasons. Firstly, it has the ability to take a completive durative adverbial, such as *in three hours* in example (196) (Van Rompaey 2013, p.203). It is also compatible with the finish/compete test, as shown in example (197), specifying a completion (ibid, p.204). The specified quantity in the count determiner *a* in *a series of challenges* is another indicator of a telic situation. Finally, although there is a plural first participant, *sixteen strangers,* only one event is occurring – two teams are competing in a series of challenges that make up one event.

> (195) Sixteen strangers, split into two teams, compete in a series of challenges
> (appendix two, line 2117)
> (196) Sixteen strangers, split into two teams, compete in a series of challenges in three
> hours
> (197) Sixteen strangers, split into two teams, *finished* competing in a series of
> challenges

Another difficult analysis of lexical aspect was in the pattern *[[human / institution]] resigns reflexive to [[state_of_affairs / action]]*, meaning someone changes their attitude or awareness to something (see section 4.4.2.1). The meaning of attitude / awareness might suggest a state, though these instances were analysed as culminations because they were dynamic not stative i.e., the events involved a change (Van Rompaey 2013, p.196). These event types could also occur in the imperative form (see example (198)), which passes the agentivity test and of a dynamic event.

> (198) Resign yourself to having to choose sides (appendix two, line 1287)

These instances also represented a sudden change of state and were generally incompatible with a -*stop* complement e.g., *she stopped resigning herself to something*. In other words, the

instantiation is referring to the exact moment of resigning themselves to something, as opposed to the ongoing event. Thus, these experiences indicated a punctual event.

It has been established in section 2.4.8 that the interaction of grammatical and lexical aspect causes split opinions in the literature and leads to difficulties in analysis. This thesis treats grammatical and lexical aspect as two separate notions that overlay each other (Olsen 1997, p.16), as opposed to grammatical aspect overriding lexical aspect. In particular, the interaction between imperfective progressive aspect and culminations or accomplishments are challenging to analyse, as it skews the temporal interpretation that is being construed. An example is shown in (199), where the progressivity in *jogging* focuses on the event in progress, suggesting an activity reading on what would have been a telic accomplishment. Owing to minimal cases of these and minimal effect on the construction, instances like these were analysed as activity-accomplishments, a subtype of accomplishments (adapting Radden and Dirven's (2007, p.181) 'accomplishing activities' label, as explained in section 2.4.8).

> (199) Two security guards are jogging out of the ballroom (appendix two, line 1697)

The interaction between imperfective progressive aspect and culminations were treated similarly in the analysis. As we saw in section 2.4.8, there are difficulties in analysing culminations in the progressive form because there is a tension between the punctuality of culminations and the durativity of progressivity (Rothstein 2004a, p.542). However, culminations in the progressive form often indicate the lead up to a transition rather than the culmination itself (Smith 1991, p.97; Kearns 2000, p.217; Leech 2004, p.24) and therefore the focus on these instances is on the preliminary stages of the event than the actual culmination point (Mittwoch 1991, p.72; Smith 1991, p.237) (see example (200)). Progressive culminations also have different structures to progressive activities or accomplishments (Rothstein 2004a; Kearns 2011) and therefore should still be analysed in their own right. These instances were analysed as a sub-type of culminations and labelled 'activity-culmination', adapting Radden and Dirven's (2007, p.181) 'culminating activities' label to focus more on the culmination part.

> (200) Younger investors with dreams of early retirement are resigning themselves to much longer stays in the workforce (appendix two, line 1255)

For simplicity's sake and in view of the low frequencies in the dataset in general, the statistical analyses were carried out according to their main situation type e.g., culmination as activity-culmination. Section 4.3.2.3 now describes and explains the statistical analyses that were

implemented in this IA study to directly compare the features of Behaviours and Intransitive Actions.

4.3.2.3 *Statistical analyses of Behaviours and Intransitive Actions*

To statistically compare the lexico-grammatical features of Behaviours and Intransitive Actions, several tests were implemented using the software 'R' (RCore Team 2021). 'R' constitutes a free workspace with a broad range of functions that enhance descriptions of data (Baayen 2008, p.4; Levshina 2015, p.21). 'Rstudio', an embedded environment in R, was used as a workspace to implement the codes and carry out the statistical tests (RStudio Team 2020).

Owing to no occurrences of *that*-complements in the data, no statistical analyses were carried out on this feature. For each of the remaining features (animacy, intransitivity, grammatical aspect and lexical aspect), an effect size test was implemented followed by a test of difference. Effect size indicates the strength of the relationship between variables (Levshina 2015, p.129): $0.1 \leq \varphi < 0.3$ is a weak effect; $0.3 \leq \varphi < 0.5$ is a moderate effect; and $\varphi \geq 0.5$ is a large or strong effect size (Sheskin 2011, p.678). Effect size tests were implemented because they help to give an "appropriate interpretation to the significance of a finding" (Ialongo 2016, p.150) and also allow for the comparison and repeatability of research (Larson-Hall and Plonsky 2015, p.135). The Phi-coefficient test is most accurate on data with two-by-two tables, and the Cramer's V test is a typical replacement of the Phi-coefficient when data is larger than two tables (Ialongo 2016, p.156), as it is a "generalised version of Phi" (Jenset 2008, p.12).

Tests for the statistical significance of differences were implemented to obtain a statistical significance in the differences between the features of Behaviours and Intransitive Actions. As defined by Sirkin (2006, p.306), statistical significance is "(t)he high probability that the difference between two means or other finding based on a random sample is not the result of sampling error but reflects the characteristics of the population from which the sample was drawn." Thus, statistical significance "does not show the strength of a relationship or the magnitude of a difference" (Levshina 2015, p.129) but rather shows the confidence level that the difference found in the data is reliable. The significance is measured by the *p*-value – if the *p*-value is smaller than the conventional level (usually 0.05 or 0.01) then the results are significant and not due to chance (ibid, p.12); the level of significance was set at 0.05 (Jenset 2008, p.7). The Chi-squared test is commonly used in linguistics on nominal data, though it

expects datapoints of larger than five (Jenset 2008, p.5). The Fisher exact test is typically used as an alternative when there is a very low sample size (N <20) (Jenset 2008, p.8) or when datapoints are less than five (Levshina 2015, p.29).

Firstly, Phi-coefficient tests were used to measure the effect size of the animacy and transitivity data (independently) because they involved two-by-two data tables (Ialongo 2016, p.156) – inanimate vs. animate and transitive vs. intransitive respectively. Chi-squared tests with Yates' continuity correction were used to test for differences in participant animacy of Behaviours and Intransitive Actions, as well as differences in transitivity.

A Cramer's V test was used to measure the effect size of the lexical aspect data because this involved a two-by-five table (from five situation types) (Jenset 2008, p.12; Ialongo 2016, p.156). A Fisher exact test was used to investigate whether there was a statistically significant difference in the lexical aspect between Behaviours and Intransitive Actions, because some of the data points were less than 5 (Jenset 2008, p.8; Levshina 2015, p.29).

For the grammatical aspect data, different tests were used for perfectivity, habituality and iterativity – as a reminder, these features occur independently despite being of the same viewpoint (see sections 2.4.7 and 4.3.2.2). Similar to lexical aspect, a Cramer's V test was used to measure the effect size of perfectivity because this involved three-by-two data (perfective, imperfective and imperfective progressive). A Fisher exact test was used to test for differences in the perfectivity of Behaviours and Intransitive Actions because some of the data points were less than 5 (Jenset 2008, p.8; Levshina 2015, p.29). Habituality and iterativity data were both two-by-two tables and therefore a Phi-coefficient test was used to measure the effect size. Chi-squared tests were used to investigate the differences in both habituality and iterativity as the sample sizes were large enough for an accurate test (Jenset 2008, p.8).

A binary decision tree (also known as 'conditional inference tree' or 'recursive partitioning') supported the interpretation of the results, which involved the *ctree()* function in the *party* package in 'R' software (Levshina 2015, p.294). Decision trees can be used to both describe data and provide a system of predicting a certain outcome (Roberts et al. 2015, p.7). Firstly, the algorithm tests the association of the independent variables with the response variable, in this case verbal category of Behaviour or Intransitive Action, and then "chooses the variable that has the strongest association with the response" (Levshina 2015, p.291). This variable is

then split into two sub-sets, and this process continues through a hierarchy of choices (Roberts et al. 2015, p.7). The variables are provided on each of the 'branches' (lines) of the tree. The *p*-value is provided at each 'question' or 'division' to outline the confidence level of this split (Levshina 2015, p.292). *P*-values are obtained through 'permutation', where statistical tests are run on rearranged datapoints to find the optimum split (Hothorn et al. 2006, p.5). This decision tree aims to provide the "optimal sequence" (Roberts et al. 2015, p.7) that will indicate whether an instance is a Behaviour or Intransitive Action. The process ends when "there are no variables that are associated with the outcome at the pre-defined level of statistical significance" (Levshina 2015, p.291). The bar plots at the bottom of the tree are known as 'leaves' and show the proportions of Behaviours and Intransitive Actions in each of the end nodes, called 'bins' (Levshina 2015, p.295). Above each bin, labelled next to 'n' in parentheses, is the number of instances in that node (ibid).

Finally, a hierarchal cluster analysis was carried out to explore the extent to which individual verbs displayed (dis)similar lexical aspect features (Levshina 2015, p.306). Firstly, a distance matrix was computed to compare the values of different verbs and determine their similarities – the more similar the verbs are then the smaller the distance between them. A hierarchal cluster analysis was then carried out to produce a dendrogram (a clustering tree). The 'average' method of agglomerative clustering was used to compare the average distances of the verbs and merges them into clusters with the smallest average distance (Levshina 2015, p.310).

4.4 Results: Corpus Pattern Analysis of Behaviours and Intransitive Actions

This section presents the results of the corpus analysis based on 1250 instances of Behaviours and 1250 instances of Intransitive Actions, as outlined in section 4.3. As a reminder, each of the 2500 instances were analysed using Corpus Pattern Analysis (CPA) and tense and aspectual analysis, as a means of exploring the lexico-grammatical features of the two verbal categories. Section 4.4.1 presents the patterns, implicatures and frequencies of Behaviours that were identified from CPA. Section 4.4.2 does the same for the Intransitive Actions. Following the same format as the Behaviours study in Chapter 3, the patterns, pattern frequency and their implicatures are outlined for each verb. For a clear reading of the patterns, adjuncts are italicised, prepositions are capitalised and optional elements are presented in round brackets. Phrasal verbs are indicated next to the patterns by 'PV'. Where five or more semantic types occur in a pattern, the semantic type is labelled *[[(in)animate participant]]*. If semantic types

revealed a different pattern i.e., the pattern changed meaning depending on semantic types, then every semantic type is displayed. Sources of the implicatures (see section 4.3.2.1) are indicated by [P] for the PDEV, [C] for the COBUILD, [F] for framenet, [L] for Levin, [OED] for Oxford English Dictionary, and [O] for 'other' such as collocational. A frequency count of mood is also displayed for each verb, though was not considered noteworthy in the results.

4.4.1 Pattern analysis of five Behaviours

The five Behaviours in this IA study include *sneeze*, *converse*, *frown*, *meditate* and *stare*, which are addressed in turn below. These verbs had relatively low polysemy, with five as the highest number of patterns for a given verb (*stare*) and only one as the lowest number (*converse*). Comparisons are drawn between these results and the results in the Behaviours study of each corresponding verb.

4.4.1.1 Sneeze

Four patterns were identified for the verb *sneeze* (see Table 4-4). The first and by far the most dominant pattern is the pure intransitive (97.2%). This result is similar to *sneeze* in the Behaviours study, where the pure intransitive pattern was also most common at 93% (see section 3.3.1.5). The second pattern is also the same pattern in each of these studies, though in this study more semantic types were available in the second participant position (*air* and *food* as well as *particle*). While there were only two patterns for *sneeze* in the previous study, the results in this IA study reveal two additional, though very infrequent, patterns: the cognate object construction in pattern 3 and the caused-motion construction in pattern 4. In terms of mood, 97.6% of instances were declarative, 2% imperative, and 0.4% interrogative.

Table 4-4: Corpus Pattern Analysis of the verb Sneeze

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal	human]] V	[[animal	human]] makes a sudden, violent, and involuntary expulsion of air and mucus through the nose and mouth [P] E.g. *A man sneezed repeatedly* (appendix two, line 56)	97.2%

Pattern Number	Pattern	Implicature	Frequency in data
2	PV: [[human]] V OUT [[air | food | particle]]	[[human]] expels [[air | food | particle]] from the body [OED] E.g. *The girl sneezes banana out* (appendix two, line 247)	1.6%
3	[[human]] V {Sneeze}	[[human]] sneezes in a particular manner [L] E.g. *… and [he] sneezed a light sneeze* (appendix two, line 72)	0.8%
4	[[human]] V [[plant_part]] ONTO [[cloth]]	[[human]] sneezes, causing [[plant_part]] to move to a particular location:[[cloth]] [O] E.g. *Navin sneezed blue pollen onto his shirt* (appendix two, line 67)	0.4%

4.4.1.2 *Converse*

One pattern was identified for the verb *converse*, making it the least polysemous verb in the dataset (see Table 4-5). In the previous Behaviours study, this pattern was split into two patterns because certain prepositional complements occurred independently. Specifically, the prepositional attachment *in [[tone / language]]* always occurred in a separate pattern to *with [[human_2]] about [[anything = topic]]*. In this study however, these two prepositional attachments occurred in the same instance multiple times (see examples (201) and (202)) where the prepositional complements are underlined).

(201) children conversed <u>with each other</u> <u>exclusively in English</u> (appendix two, line 332)

(202) where they might converse <u>in lowered voices</u> <u>about the members of Lady Dustan's party</u> (appendix two, line 284)

In terms of mood, 96.8% of instances were declarative, 2% interrogative and 1.2% imperative.

Table 4-5: Corpus Pattern Analysis of the verb Converse

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal_group | human_1 | human_group | machine]] V (WITH [[human_2]]) (ABOUT/ON [[(in)animate participant = topic]]) (IN [[tone | language]])	[[animal_group | human_1 | human_group | machine]] discusses topic (with [[human_2 | human_group]]), in a particular [[tone | language]] [C] E.g. *John Collins converses with reporters about his versatile offense game* (appendix two, line 470)	100%

4.4.1.3 Frown

Three patterns were identified for the verb *frown* (see Table 4-6). The first two patterns are the same patterns that occurred with *frown* in the Behaviours study, at similar frequencies. One additional pattern was revealed in these results (pattern 3), with the prepositional complement *on/upon [[inanimate participant]].* The implicature of this third pattern was in a more mental sense than the other two physical senses. In terms of mood, 99.2% of instances were declarative and 0.8% imperative.

Table 4-6: Corpus Pattern Analysis of the verb Frown

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] furrows their brows, usually expressing disapproval or displeasure [P] E.g. *The president frowned* (appendix two, line 513)	76.8%
2	[[human]] V AT/OVER [[(in)animate_participant]]	[[human]] furrows their brows, expressing disapproval at/over [[(in)animate_participant]] [P] E.g. *... and all three frowned at the unwashed plates in the sink* (appendix two, line 611)	17.6%
3	[[human]] V ON/UPON [[(in)animate_participant]]	[[human]] disapproves of [[(in)animate_participant]] [P] E.g. *International selection committees frown on pre-Olympic negativity* (appendix two, line 572)	5.6%

4.4.1.4 Meditate

Three patterns were identified for the verb *meditate* (see Table 4-7). The first, pure intransitive pattern accounts for nearly two thirds of instances (64.8%), similar to the *meditate* results in the Behaviours study (63%). There were only two patterns and no inanimate subjects of *meditate* in the previous study (and the second pattern different in prepositional attachment to the second pattern in Table 4-7), though as shown in Table 4-7, inanimate subjects of *meditate* in this IA study determined a third pattern. In terms of mood, 87.6% of instances were declarative, 7.6% imperative, and 4.8% interrogative.

Table 4-7: Corpus Pattern Analysis of the verb Meditate

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] focuses their minds on calm thoughts in order to achieve an altered state of consciousness [P] E.g. *A lot of great athletes meditate* (appendix two, line 884)	64.8%
2	[[human]] V ON/OVER/ABOUT [[(in)animate participant]]	[[human]] thinks deeply and at length about [[(in)animate_participant]] [P] E.g. *We will meditate on scripture* (appendix two, line 778)	33.2%
3	[[abstract_entity_1 | artifact]] V ON/UPON [[abstract_entity_2]]	[[abstract_entity_1 | artifact]] concerns (is about) [[abstract_entity_2]] [O] E.g. *His tunes meditate on the human need for nature* (appendix two, line 914)	2%

4.4.1.5 Stare

Five patterns were identified for the verb *stare*, which is the highest number of patterns amongst the Behaviours, making it the most polysemous (see Table 4-8). Whilst the verb is polysemous, the first pattern with a prepositional complement headed by *at* is dominant (69.2%). The first two patterns here are the same as the only two patterns of *stare* revealed in the Behaviours study. In terms of mood, 99.2% of instances were declarative and 0.8% imperative.

Table 4-8: Corpus Pattern Analysis of the verb Stare

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V AT [[(in)animate_participant]]	[[human]] looks fixedly at [[(in)animate_participant]] (mostly human) with his or her eyes wide open [P] E.g. *Scott stares at Jacob* (appendix two, line 1041)	69.2%
2	[[human]] V *direction*	[[human]] looks fixedly with his or her eyes wide open [P] E.g. *Dexter stared out the room* (appendix two, line 1154)	29.2%
3	[[abstract_entity]] V [[human]] {in the face}	[[abstract_entity]] is obvious to [[human]] [P] E.g. [might also have been expected to recognize literary distinction]… *when it was staring them in the face* (appendix two, line 1084)	0.8%
4	[[eventuality=bad]] V [[human]] {in the face}	[[human]] looks certain to be about to experience [[eventuality=bad]] [P] E.g. *The sprawl… is staring them in the fac*e (appendix two, line 1114)	0.4%
5	PV: [[human_1]] V DOWN [[human_2]]	[[human_1]] looks directly and fixedly into the eyes of [[human_2]] until [[human_2]] looks away [P] E.g. *Andrews stares down Clemens* (appendix two, line 1195)	0.4%

4.4.2 Pattern analysis of five Intransitive Actions

The five Intransitive Actions include *resign*, *jog*, *walk*, *compete* and *climb*, and their typical patterns and semantic descriptions are outlined in turn below. Overall, verb polysemy was higher in Intransitive Actions than in Behaviours, as *walk* and *climb* both had nine patterns. That said, *resign*, *jog* and *compete* all had pattern numbers in the same range as the Behavioural verbs (three, five and two respectively).

4.4.2.1 Resign

Three patterns were identified for the verb *resign* (see Table 4-9). Most instances of the first, most dominant pattern are bare intransitives (N=192) but there are also instances with the

prepositional complement *from [[institution / role]]* (N=24). In terms of mood, 98.8% of instances were declarative, 0.8% imperative, and 0.4% interrogative.

Table 4-9: Corpus Pattern Analysis of the verb Resign

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (FROM [[institution | role]])	[[human]] voluntarily leaves a position of work, of one's own free will [C,F,OED] E.g. *Whitman resigned in May* (appendix two, line 1379)	87.2%
2	[[human]] V [[role]]	[[human]] gives up a role to another person [C,OED] E.g. *Ensign resigned his leadership post* (appendix two, line 1272)	6.4%
3	[[human | institution]] V {reflexive} TO [[action | state_of_affairs]]	[[human | institution]] changes their awareness of or attitude to [[action | state_of_affairs]] [C] E.g. *Penny…resigns herself to a "scrappy kind of life"* (appendix two, line 1425)	6.4%

4.4.2.2   Jog

Five patterns were identified for the verb *jog* (see Table 4-10). The dominant pattern has a motion sense with a human subject in an intransitive clause, typically with an adverb of direction. In terms of mood, 94.8% of instances were declarative, 4.8% imperative, and 0.4% interrogative.

Table 4-10: Corpus Pattern Analysis of the verb Jog

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (*adv*(*direction*))	[[human]] runs at a steady, relatively slow pace [P] E.g. *The trio jogs towards the hill* (appendix two, line 1553)	90.4%

Pattern Number	Pattern	Implicature	Frequency in data
2	[[(in)animate_participant]] V {memory}	[[(in)animate_participant]] causes [[human]] to remember something [P] E.g. *This column jogged my memory* (appendix two, line 1623)	7.2%
3	[[natural_landscape_feature | physical_object]] V *direction*	[[natural_landscape_feature | physical_object]] has a line of course in a particular direction [L,O] E.g. *where the river jogs south* (appendix two, line 1504)	1.6%
4	[[human_1]] V [[human_2]]	[[human_1]] takes steps to ensure that [[human_2]] completes activity in a timely fashion [P] E.g. *If we don't jog her elbow* (appendix two, line 1613)	0.4%
5	[[human]] V [[physical_object]]	[[human]] knocks [[physical_object]], causing it to move slightly [P] E.g. *Wilder jogged it to the left* (appendix two, line 1546)	0.4%

4.4.2.3 Walk

Nine patterns were identified for the verb *walk* (see Table 4-11). *Walk* (as well as *climb*, as we shall see in section 4.4.2.5) has the highest number of patterns amongst the Intransitive Actions and therefore is the most polysemous. Whilst there is greater polysemy with *walk*, the high frequency of the first pattern (89.6%) suggests that this is the predominantly established meaning. In terms of mood, 97.2% of instances were declarative, 1.6% imperative, and 1.2% interrogative.

Table 4-11: Corpus Pattern Analysis of the verb Walk

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (*adv*(*direction*))	[[human]] moves on foot at a fairly slow pace [C,F] E.g. *She was walking towards the glass entrance doors* (appendix two, line 1793)	89.6%

Pattern Number	Pattern	Implicature	Frequency in data
2	[[human]] V OFF / AWAY	[[human]] leaves a place [C] E.g. *Candace said <u>and walked off</u>* (appendix two, line 1797)	4.4%
3	[[human]] V OFF / AWAY FROM [[abstract_entity]]	[[human]] abstains / withdraws from a situation [C] E.g. *Do I walk away from the case?* (appendix two, line 1997)	1.6%
4	[[human]] V AWAY / OUT THE DOOR WITH [[abstract_entity | money | physical object]]	[[human]] wins a prize or form of competition [C] E.g. *The Hawkses walked away with top prizes* (appendix two, line 1824)	1.2%
5	[[human_1]] V [[human_2]] TO [[location]]	[[human_1]] accompanies [[human_2]] somewhere on foot [C,F] E.g. *I'll walk you to your room* (appendix two, line 1845)	0.8%
6	[[human]] V	[[human]] gets off freely from a criminal charge [OED – slang for walk free] E.g. *In other words, <u>he walked</u>, free to try to rip off other people* (appendix two, line 1966)	0.8%
7	[[human]] V	[[human]] reaches first base automatically after not hitting at four balls pitched outside the strike zone, in a baseball game [OED - jargon] E.g. *He walked* more than he struck out (appendix two, line 1937)	0.8%
8	[[human]] V [[animal=dog]]	[[human]] takes dog on a walk [C] E.g. *I walk my dog* (appendix two, line 1924)	0.4%
9	[[human]] V OUT ON [[human_group]]	[[human]] abandons [[human_group]] [C] E.g. *Anthony Smith walked out on the team last season* (appendix two, line 1920)	0.4%

4.4.2.4   Compete

Two patterns were identified for the verb *compete* (see Table 4-12), which is the lowest number of patterns amongst the Intransitive Actions and therefore *compete* is the least polysemous

Inransitive Action verb. The first pattern, with an animate subject, is by far the most dominant (91.6%). In terms of mood, 98% of instances were declarative and 2% interrogative.

Table 4-12: Corpus Pattern Analysis of the verb Compete

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal_1 | human_1 | human_group | institution_1 | plant_1]] V (WITH / AGAINST [[animal_2 | human_2 | institution_2 | plant_2]]) (FOR [[abstract_entity]]) (IN / AT [[event]])	[[animal_1 | human_1 | Human_group | Institution_1 | plant_1]] strives to gain or win [[abstract_entity]] with/against [[human_2 | institution_2 | animal_2 | plant_2]] [C,F,OED] E.g. *We are competing with our neighbors* (appendix two, line 2036)	91.6%
2	[[abstract entity_1 | physical_object_1]] V (WITH [[abstract entity_2 | physical_object_2]]) (FOR [[abstract_entity_3]])	[[abstract entity_1 | physical_object_1]] rivals with [[abstract entity_2 | physical_object_2]]) for attention or popularity [O] E.g. *colours compete with each other for attention* (appendix two, line 2064)	8.4%

4.4.2.5 Climb

Nine patterns were identified for the verb *climb* (see Table 4-13). Along with *walk*, *climb* has the highest number of patterns amongst the Intransitive Actions and therefore is one of the most polysemous verbs. In terms of mood, 99.2% of instances were declarative and 0.8% imperative.

Table 4-13: Corpus Pattern Analysis of the verb Climb

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal |human | vehicle]] V (*adv(direction)*)	[[animal |human | vehicle]] moves in a particular manner to result in a new location [L,C,OED] E.g. *I climbed into bed* (appendix two, line 2280)	60.4%

Pattern Number	Pattern	Implicature	Frequency in data
2	[[human]] V [[natural_landscape_feature | physical_object]]	[[human]] ascends [[natural_landscape_feature | physical_object]] (usually in order to reach the top of it) in a particular manner[OED] E.g. *He … climbed Taos Mountain* (appendix two, line 2393)	18.8%
3	[[abstract_entity]] V ((FROM) [[numerical_value_1]]) (TO/TOWARD/ABOVE [[numerical_value_2]])	[[abstract_entity]] increases in quantity or level [C] E.g. *PDC's stock has climbed 58 percent to $52.55 a share* (appendix two, line 2386)	10.4%
4	[[natural_landscape_feature_1 | route | structure]] V *direction / distance /* [[natural_landscape_feature_2]]	[[natural_landscape_feature_1 | route | structure]] has a line of course in a particular location / direction [L] E.g. *The Twin Brook Trail then climbs to Galehead Hut* (appendix two, line 2276)	3.2%
5	[[bird | cloud | planet]] V *location*	[[bird | cloud | planet]] gradually moves in the air to a higher location [OED, O] E.g. *The giant planet climbs higher in the eastern sky before midnight* (appendix two, line 2413)	2.4%
6	[[human = pilot | plane]] V (*direction*)	[[human = pilot]] operates [[plane]] so that it moves higher through the air [OED] E.g. *The American Airlines 767 was still climbing to cruising altitude* (appendix two, line 2321)	1.6%
7	[[human]] V TO {their feet}	[[human]] moves to standing position [O] E.g. *I climbed to my feet with the speed of a slug* (appendix two, line 2427)	1.2%
8	[[plant]] V *direction*	[[plant]] grows / creeps up by the aid of tendrils or by twining [OED] E.g. *Bougainvillea climbed around stucco columns* (appendix two, line 2357)	1.2%

Pattern Number	Pattern	Implicature	Frequency in data
9	[[sound]] V	[[sound]] increases in volume [O] E.g. *The deep male voices climbed* (appendix two, line 2271)	0.8%

4.5 Results and discussion: The lexico-grammatical features of Behaviours and Intransitive Actions

As stated in section 4.2.3, the aim of this IA study is to examine whether Behaviours can be empirically differentiated from Intransitive Actions (another type of 'pure' intransitive category). This section now outlines the results and discusses the five lexico-grammatical features that were investigated: subject animacy (section 4.5.1), intransitivity (section 4.5.2), occurrence with *that*-complements (section 4.5.3), grammatical aspect (section 4.5.4) and lexical aspect (section 4.5.5). Section 4.6 explores these five features collectively and considers the extent to which Behaviours and Intransitive Actions warrant two different categories.

4.5.1 Animacy of Behaviours and Intransitive Actions

Overall, 99.2% of the Behaviour subjects and 92.88% of the Intransitive Actions subjects were animate (see Figure 4-3). These findings were anticipated and confirm what has been reported in the literature (Smith 1978a; Levin 1993; Halliday 1994; van Gelderen 2018, pp.28–29). For example, Smith (1978, fn 12 p.109) states that "most intransitive verbs in English require animate subjects". As discussed in Chapter 2 and above, both Behaviours and Intransitive Actions typically involve unergative verbs and therefore these results support the claim that animate first participants occur with unergative verbs (van Gelderen 2018, pp.28–29). It was speculated in the Behaviours study animacy results that the animacy feature is likely one of intransitives in general rather than of Behaviours specifically, which is supported by the animacy results in this IA study.

These animacy results did not reveal any clear differences between Behaviours and Intransitive Actions. A Phi-coefficient test indicated a weak effect size (0.165) and therefore minimal difference in animacy. The statistically significant result in a Chi-squared test with Yates' continuity correction (X^2 (1) = 66.282, $p < 0.001$) indicates that we can be highly confident in this similarity regarding animacy. Therefore, the difference in subject animacy was not strong

enough to expect it to be replicable. In other words, animacy does not appear to contribute as a differentiating feature for Behaviours as compared to Intransitive Actions. This finding was largely expected, because the Behaviours study (Chapter 3) had already indicated subject animacy as a feature of Behaviours, and the selection process of Intransitive Actions considered verbs that would likely have animate participants (see section 4.3.1). Subject animacy was still worth considering however, because we can never predict what the data will show (as we have already seen with the grammatical aspect results in the Behaviours study in Chapter 3).
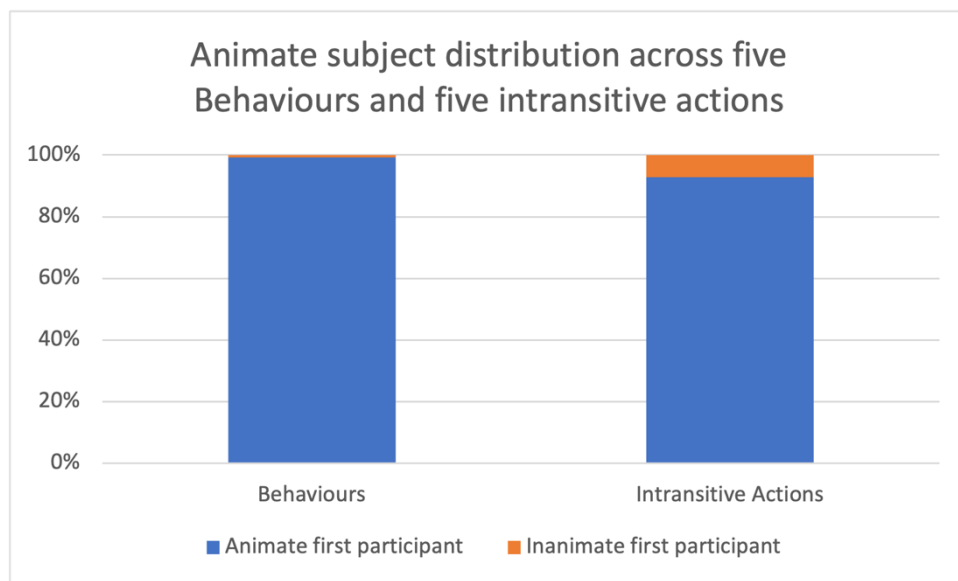
Figure 4-3: The distribution of animate participants across five Behaviours and five Intransitive Actions

Every instance of two Behaviours (*sneezing* and *frowning*) and two Intransitive Actions (*resigning* and *walking*) had animate subjects, followed closely by *conversing* (99.6%), *staring* (98.4%), *meditating* (98%) and *jogging* (93.8%). Two Intransitive Actions had animate subjects in less than 90% of instances: *competing* at 89.6% and *climbing* at 81.6%. Most inanimate subjects of *competing* occurred in pattern 2 – *[[abstract entity_1 / physical_object_1]] competes (with/against [[abstract entity_2 / physical_object_2]]) (for [[abstract_entity]])* (8.4%) (see section 4.4.2.4). The remaining 0.6% of *compete's* inanimate participants subjects were the semantic types *particle* or *plant*. The inanimate subjects of *climbing* mainly occurred in pattern 3 – *[[abstract_entity]] climbs ([[numerical_value_1 / from numerical_value_1]]) (to/toward/above [[numerical_value_2]])* – which represented 10.4% of this verb's dataset. Other inanimate subjects included: *route* (2%); *planet* or *plant* (each <2%); *plane, cloud* or *vehicle* (each 1%); and *natural landscape feature* or *sound* (each <1%). There were no clear differences in the semantic nature of the inanimate subjects between

Intransitive Actions and Behaviours, as inanimate Behavers also included *abstract entities*, as well as *eventualities* and *artifacts*.

We can see from the CPA results in section 4.4 that substituting an animate subject for an inanimate one in certain patterns changes the meaning of the pattern and results in a different sense of the verb in use. For example, replacing *human* with *natural landscape feature* in the pattern *[[human]] jogs direction* results in a different pattern and sense of *jog*, as shown in examples (203) and (204).

(203) They jogged across the street (appendix two line 1740)
(204) where the river jogs south between groves of firs and pines (appendix two, line 1504)

The clause in example (204) is an instance of fictive motion (Talmy 2000) that represents a river with a line of course in a particular direction (see section 4.4.2.2), and differs from the more typical manner of motion sense of *jog* in example (203). A similar case is made for Behaviours where a change in subject animacy of *meditate* creates a new pattern, such as *[[human]] meditates on [[abstract_entity]]* (appendix two, line 834) and *[[artifact]] meditates on [[abstract_entity]]* (appendix two, line 831).

It might be argued that instances with inanimate participants represent different experiences altogether and would not be classified as Behaviours or Intransitive Actions. For example, the instance in (204) refers to the state of the participant (*the river*) and would not likely be classified as Behaviour or Intransitive Action but rather, given its stative meaning, as a relational process within SFL. As shown in section 2.2.1, relational processes relate separate entities to each other and can express an attribute of something, such as the position of a river.

4.5.2   Intransitivity of Behaviours and Intransitive Actions

Overall, 99.28% of Behaviours and 93.12% of Intransitive Actions were intransitive (see Figure 4-4). Three Behaviours – *converse, frown* and *meditate* – and one Intransitive Action – *compete* – only had intransitive instances. Five experiences also had an intransitivity rate above 90%; *walk* (98.8%), *stare* (98.4%), *sneeze* (98%), *resign* (93.6%), and *jog* (92%). The only experience with less than 90% of intransitive instances was *climb* (81.2%). This high frequency of intransitives was expected; the Behaviours study revealed that the Behaviours were typically

intransitive (see Chapter 3), and the name and criterion of Intransitive Actions indicated that they would result in typically intransitive instances. There were still some exceptions however, as shall be outlined below.
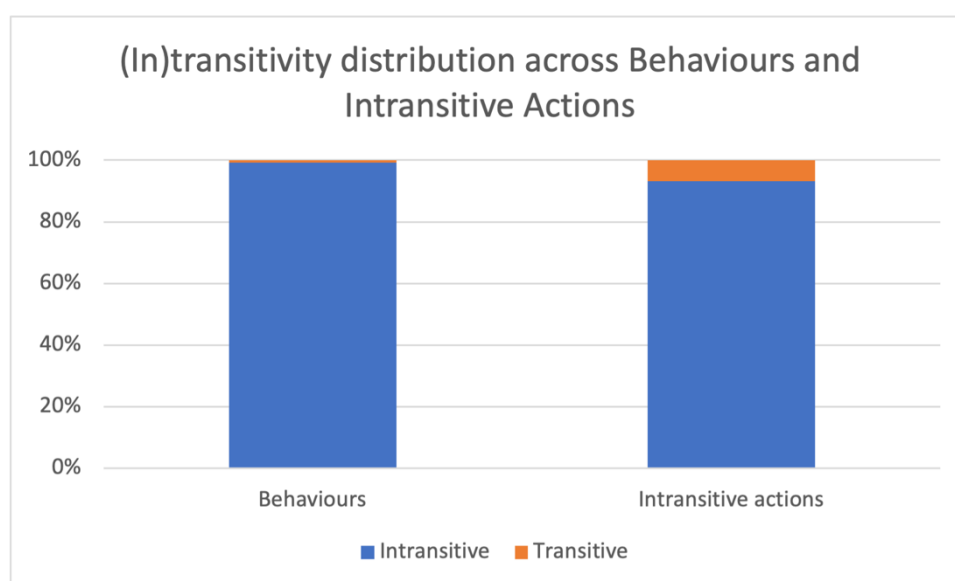
Figure 4-4: The distribution of (in)transitivity across five Behaviours and five Intransitive Actions

Transitive instances included transitive phrasal verbs (see example (205)), idioms (see example (206)), or transitive patterns (see example (207)). The transitive phrasal verb patterns occurred with the verbs *sneeze* and *stare* and despite being transitive, they appeared to still represent Behaviours. For example, *sneezing banana out* in (205) has the implicature *human expels food from the body* (see section 4.4.1.1) which is arguably still indicative of a bodily function or physiological reaction. However as highlighted in section 4.2.1, it is difficult to determine, based on semantics, whether certain instances are a Behaviour or Intransitive Action.

(205) the girl sneezes banana out (appendix two, line 247)

Idioms or metaphorical instances tended to represent mental experiences rather than Behaviours or Actions. For example, the instance in (206) has the implicature *human / institution changes their awareness of or attitude to action / state_of_affairs* (pattern 3 section 4.4.2.1).

(206) I've resigned myself to take the fall gracefully (appendix two, line 1310)

The transitive pattern in example (207) – *[[(in)animate_participant]] V {memory}* – is also more likely to represent a mental experience as it semantically represents *(in)animate_participant causes human to remember something* (pattern 2 in section 4.4.2.1).

All instances of this pattern were transitive, with *memory* as the direct object that can be passivised.

(207) maybe this will jog your memory (appendix two, line 1647)

As stated above, *climb* had the most transitive instances out of all the verbs. All transitive instances of this verb occurred in pattern 2 – *[[human]] climbs [[natural_landscape_feature / physical_object]]* (see section 4.4.2.5). An example is shown in (208).

(208) He climbed trailless peaks (appendix two, line 2296)

Climb is an interesting case because it has two main senses: to ascend something and to move with a manner of clambering (Fillmore 1982). Instances with inanimate subjects or subjects without limbs tend to only encode the ascending sense (Levin and Rappaport Hovav 2013, p.10), such as the intransitive pattern 5 – *[[bird / cloud / planet]] climbs location* (see example (209)). Conversely, the intransitive pattern 1– *[[human]] climbs direction* – only encodes the clambering sense (see example (210)).

(209) As [Jupiter] climbs higher in the sky (appendix two, line 2369)
(210) I climb into the car (appendix two, line 2259)

The transitive uses (as in example (208)) appear to converge these two senses, contradicting Levin and Rappaport Hovav's (2010) initial idea that verbs lexicalize meaning of either manner or result. The transitive instances of *climb* were much less frequent than the intransitive ones, occurring in only 18.8% of the verb's instances. Whilst there is not scope in this thesis for a full exploration of the instances of *climb*, for interesting case studies see Goddard (2020) and Levin and Rappaport Hovav (2013).

While the high frequency of intransitives was to be expected, the results indicated a preference among Intransitive Actions to occur with a complement of one kind or another and Behaviours to occur as a bare intransitive, where either nothing or adjuncts followed the verb (see Table 4-14).

Table 4-14: Raw frequencies of each verb categories' construction type

Construction type	Verb category	
	Behaviours	**Intransitive Actions**
Bare intransitive	N= 708	N= 444
Intransitive with complement	N= 533	N= 720
Transitive	N= 9	N= 86

Resign was the only Intransitive Action verb to most frequently occur in the bare intransitive construction. The Behavioural verbs were more evenly split; three verbs most frequently occurred as bare intransitives (*sneeze*, *frown*, *meditate*) and two verbs most frequently with prepositional complements (*converse*, *stare*). These differences are summarised in Table 3-21, where Behavioural verbs are colour-coded in blue and intransitive action verbs in red.

Table 4-15: The most common constructions across 5 Behavioural verbs and 5 intransitive action verbs

Most common construction	Verb
Simple intransitive (eg. *Human V*)	Sneeze, Frown, Meditate, Resign
Intransitive with prepositional complement (eg. *Human V to (in)animate_participant*)	Converse, Stare, Jog, Walk, Compete, Climb

Certain verbs had more P-items available to them in the complement attachment, though there was no clear trend between the Behaviours and Intransitive Actions. The term 'P-items' is used here to refer to the group of lexical items that include prepositions, particles, adverbs etc, such as *in*, *on* and *to* (Fontaine 2017). For example, *sneeze*, *converse*, *frown*, *meditate* (Behaviours) and *resign* and *compete* (Intransitive Actions) were typically limited to five or less P-items across their patterns (see section 4.4). The motion verbs from the Intransitive Action group (*jog*, *walk*, *climb*) as well as *stare* from the Behaviours group occurred more frequently with a greater variety of P-items. The variety of P-items typically occurred in their patterns *human V direction*, which included at least 10 different P-item attachments for each of these verbs. Interestingly, these four verbs with a wider variety of prepositional attachment also had the highest number of patterns. The higher number of patterns seems logical considering the combination of prepositional complement and verb produces a new construction and meaning alternation, though most of this flexibility was involved in one pattern with the adverb *direction*. Therefore, it might be that greater flexibility in the verb's nature might allow it to be

more polysemous. Non-prepositional complements (such as adverbial objectives – defined in section 2.1) were rare in patterns of Behaviours (0.2% of Behavioural instances) and Intransitive Actions (3% of intransitive action instances), though Intransitive Actions evidently had more.

In terms of comparing the general transitivity (intransitive vs. transitive) of Behaviours and Intransitive Actions, a Phi-coefficient test revealed a weak effect size (0.161), indicating similarity in the transitivity of the two categories. A Chi-squared test with Yates' continuity correction revealed that we can be highly confident about this similarity (X^2 (1) = 63.202, $p <$ 0.001). Thus, if we want to identify a differentiating feature between Behaviours and Intransitive Actions, we cannot count on intransitivity.

4.5.3   Occurrence of *that*-complements in Behaviours and Intransitive Actions

No instances across the whole dataset occurred with a *that*-complement, which is unsurprising since Halliday (1994) claims that neither Behaviours nor Intransitive Actions occur with a *that*-complement, or in SFL terms, these process types cannot project locution (indirect discourse) or fact (see also Martin et al. 1997). Given this feature is shared between Behaviours and Intransitive Actions, the absence of *that*-complements in both categories cannot be considered a differentiating lexico-grammatical feature.

4.5.4   Grammatical aspect of Behaviours and Intransitive Actions

These grammatical aspect results are outlined with present tense data only, in line with the claims that imperfective progressive aspect is characteristic of Behaviours and Intransitive Actions in the unmarked present form (see section 4.2). Amongst the Behaviours category, 90.6% of instances were perfective, 8.4% were imperfective progressive and 1% were imperfective (see Figure 4-5). Amongst the Intransitive Action category, 83% of instances were perfective, 13.1% were imperfective progressive and 3.9% were imperfective. Both categories had a majority of perfective Instances in present tense which suggests that perfectivity is likely a prevalent feature of both Behaviours and Intransitive Actions. The high percentage of perfective instances is similar to the results of the Behaviours study where Behaviours were most often perfective rather than imperfective progressive (see Chapter 3). Experiences with the highest frequency of perfective instances included *frown* (97.2%), *sneeze* (97%) and *climb*

(91.5%) and experiences with the highest frequency of imperfective progressive instances included *resign* (19%), *stare* (16%) and *compete* (15.2%).
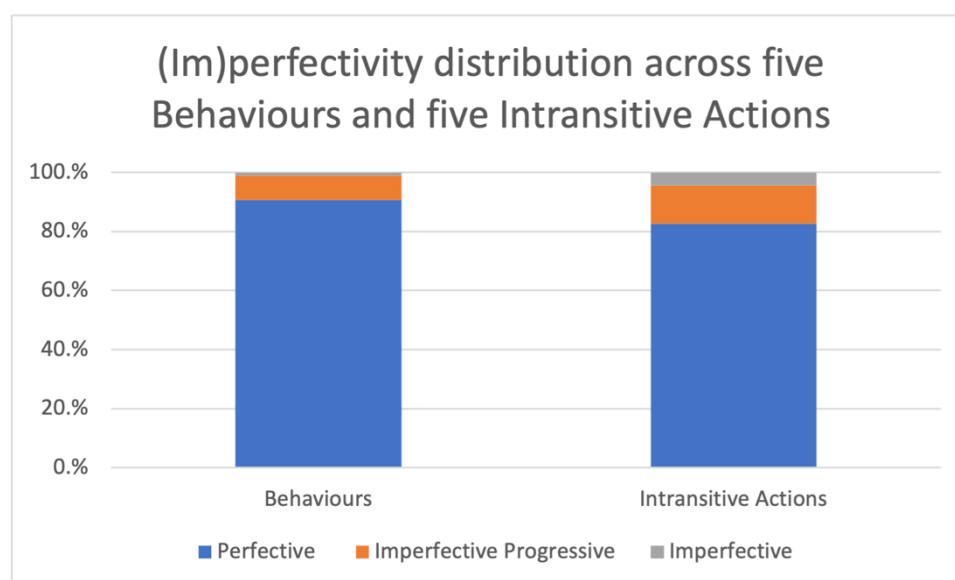
Figure 4-5: The distribution of (im)perfectivity across five Behaviours and five Intransitive Actions

A weak effect size (0.121) in a Cramer's V test indicated similarity in the (im)perfectivity of Behaviours and Intransitive Actions. This similarity was highly statistically significant ($p < 0.001$) and therefore (im)perfectivity cannot be used as a feature if we want to distinguish between Behaviours and Intransitive Actions.

The similarities in grammatical expression support literature which shows that Behaviours and Intransitive Actions grammatically function in a similar way. However, the perfectivity results are prevalent as they do not uphold the claims that imperfective progressive aspect is most typical of the two categories. For example, research in SFL shows the similarities in behavioural and intransitive material processes (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139), including their aspectual function in the progressive. Additionally, Leech (2004, p.18-24) explores verbs in the progressive aspect, which include typical Behavioural and Intransitive Action verbs.

One speculation for the reason behind the high frequency of perfectives is text register (as suggested in the Behaviours study, see section 3.3.2.5). For example, in this dataset no imperfective instances occurred in fiction texts. Imperfective progressive instances most

frequently occurred in news texts, whilst perfective instances most frequently occurred in fiction texts. These proportions are visualised in Figure 4-6. The five registers in the data are shown in the key and include: academic journals, newspapers, transcripts of spoken language, fiction texts and magazines. Though it is not in the scope of this research to investigate genre further, an exploration of reasons for the high frequency of perfectives could provide interesting findings.
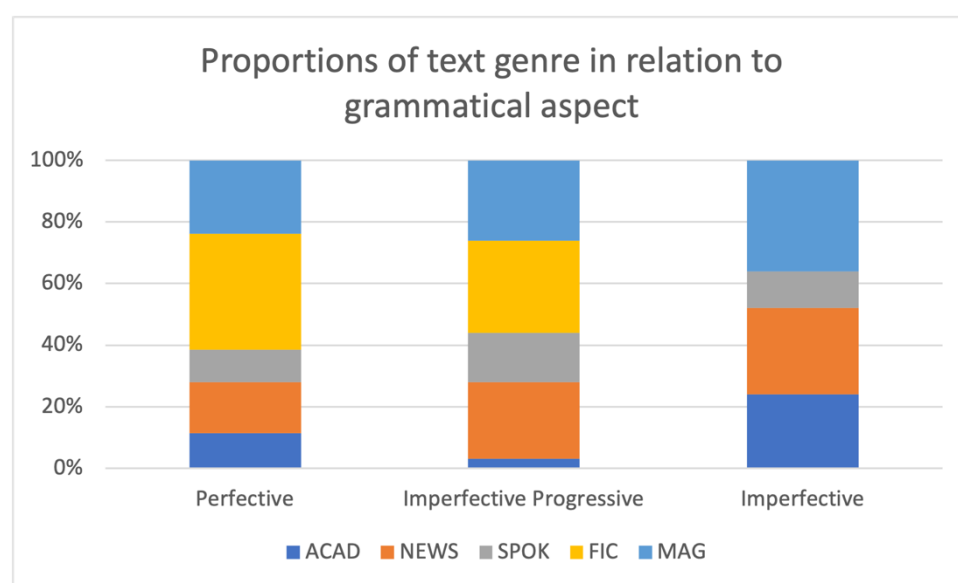
Figure 4-6: The distribution of five text genres in relation to three forms of grammatical aspect

Most instances of both Behaviours and Intransitive Actions in present tense were non-habitual – 59% and 75% respectively (see Figure 4-7). Bartlett (2014, p.50) states that "the use of simple present with material processes suggests habitual or repeated actions or activities" and this often distinguishes materials from behavioural processes. Following his claim, we would expect Behaviours and Intransitive Actions in the present perfective form to reveal differences in habituality. A weak effect size (0.165) in a Phi-coefficient test indicated a similarity in habituality between the two groups, and this similarity was highly statistically significant $(X^2 (1) = 24.951, P < 0.001)$. Therefore, habituality could not confidently be considered as a distinguishing feature between Behaviours and Intransitive Actions.
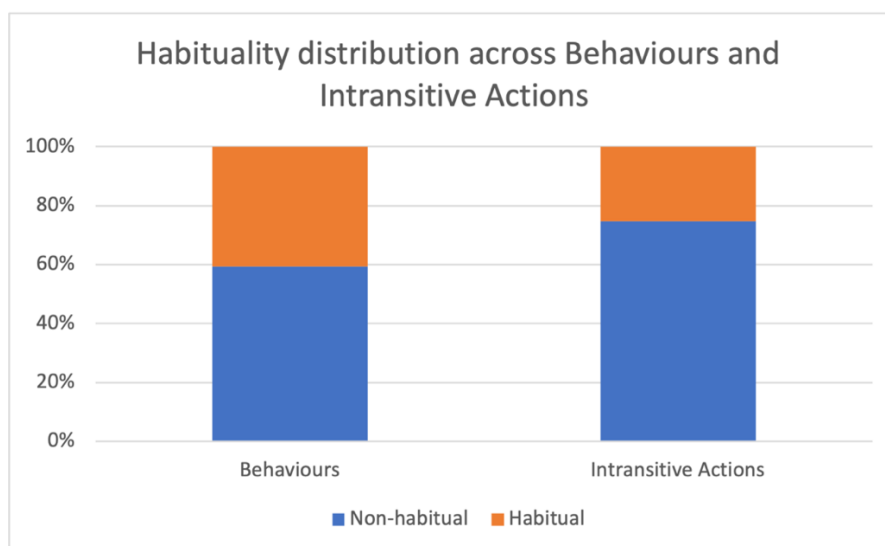
Figure 4-7: The distribution of habituality across five Behaviours and five Intransitive Actions

Iterative instances were very low in both Behaviours and Intransitive Actions with only 6% in Behaviours and 2% in Intransitive Actions (see Figure 4-8). A Phi-coefficient test indicated a weak effect size (0.12) and so the difference in iterativity of Behaviours and Intransitive Actions was minimal. The statistically significant result in a Chi-squared test with Yates' continuity correction $(X^2 (1) = 12.449, P < 0.001)$ indicates that we an be highly confident in this similarity regarding iterativity, and therefore this feature also did not contribute to distinguishing between Behaviours and Intransitive Actions. Additionally, Bartlett's (2014, p.63) claim that simple present material processes typically represent habitual or repeated activities is not upheld by the results here, where only 25% of Intransitive Actions in the present tense were habitual and only 2% were iterative.
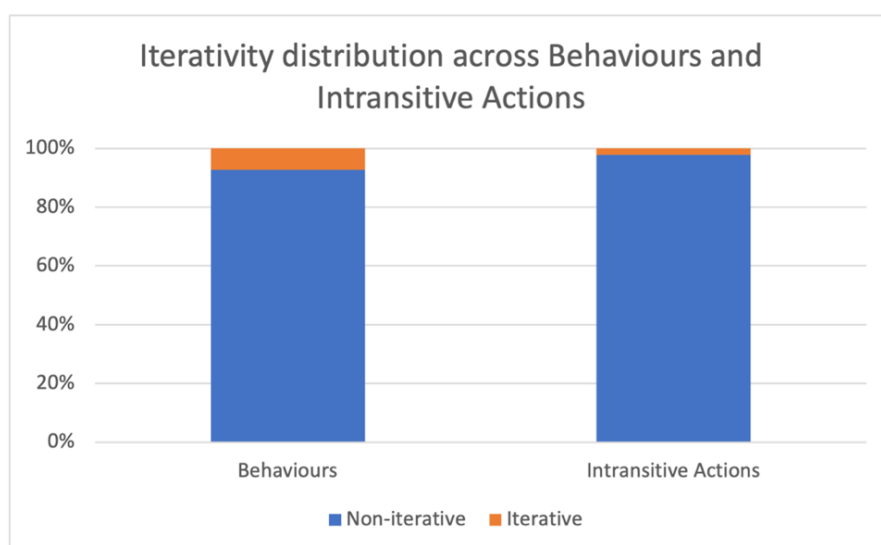
Figure 4-8: The distribution of iterativity across five Behaviours and five Intransitive Actions

4.5.5 Lexical aspect of Behaviours and Intransitive Actions

The lexical aspect analysis revealed the most noteworthy difference of all the features. A Cramer's V test revealed a strong effect size (0.671) and a Fisher exact test revealed a statistically significant difference in the lexical aspect of Behaviours and Intransitive Actions ($P < 0.001$). Overall, situations represented by the Behavioural verb instances were most often activities (78.2%) or semelfactives (20%) and situations represented by Intransitive Action verb instances were mostly activities (40%), accomplishments (35.2%) or culminations (22.2%). Only 1.8% of verbs in the Behaviours category and 2.6% of those in the Intransitive Actions category were states.

While the dataset included only very few instances of states, it is worth considering what this tells us. As Behaviours and Intransitive Actions theoretically are not states, a stative use of the verbs would indicate a semantic shift that results in the representation of an alternative verb category; such a shift reflects the verb's meaning potential. Still, this infrequency of states supports claims that uncontrolled processes (typically Behaviours), controlled motional processes (typically Intransitive Actions) and uncontrolled motional processes (typically Behaviours or Intransitive Actions) tend to be durative (van Gelderen 2019, p.220). No accomplishments or culminations were found amongst instances of Behavioural verbs, whilst no semelfactives occurred amongst Intransitive Action verbs. These results are displayed in Figure 4-9.
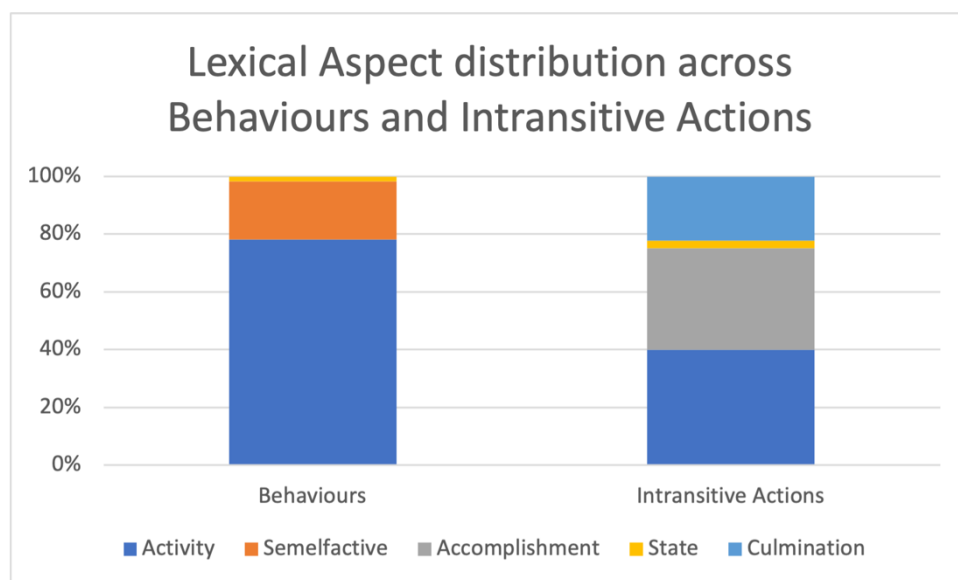
Figure 4-9: The distribution of lexical aspect across five Behaviours and five Intransitive Actions

There was little polysemy in terms of the temporal meaning of the Behavioural verbs, as each verb in the Behaviour category expressed either just one situation type, or two types with one dominant type. Every instance of *sneeze* was a semelfactive situation type and every instance of *converse* was a culmination. The majority of instances with *stare* (98.8%), *meditate* (98%) and *frown* (94.4%) were activities and the remainder of instances were states. The Intransitive Actions category was a more diverse category than Behaviours and therefore more polysemous in temporal meaning, besides *resign* in which every instance was a culmination situation type. Activity was the most frequent situation type for *jog* (58%) and *compete* (75.6%), whilst accomplishment was the majority in *walk* (52.4%) and *climb* (74%). Figure 4-10 displays the situation types in each experience, with the five Behavioural verbs on the left and five Intransitive Action verbs on the right.
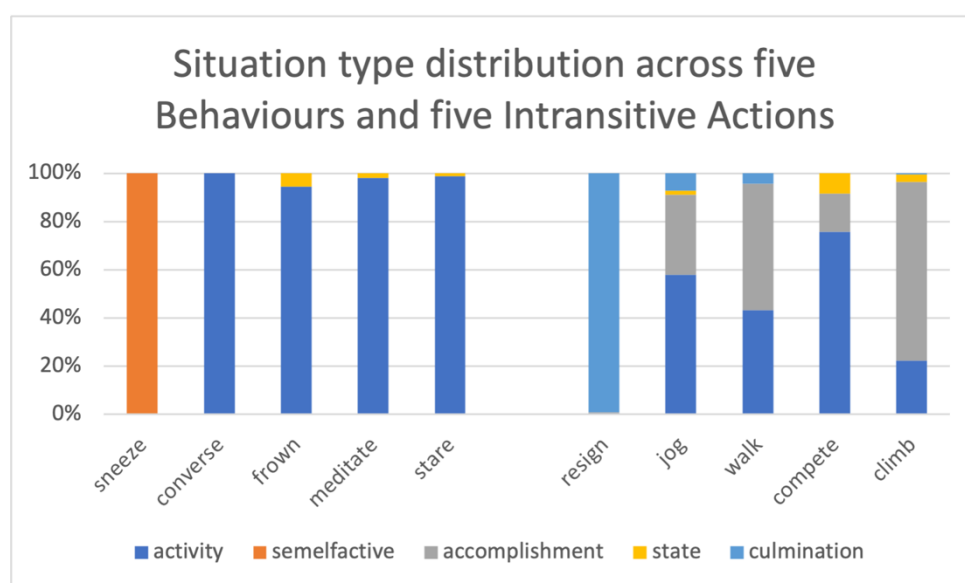
Figure 4-10: The distribution of situation types across five Behaviours and five Intransitive Actions

The high proportion of activities overall (59%) is not surprising given that unergatives are linked to atelicity (Tenny 1987, p.264; Dowty 1991; van Gelderen 2018, p.10), and particular Behavioural and Intransitive Action verbs are described as activities (Rappaport Hovav and Levin 1998a; Halliday and Matthiessen 1999). Complementation and adverbials had a telicizing effect on instances of *jog*, *walk*, *climb* and *compete* (cf locative complements Davidse and Olivier 2008), changing the activity interpretation into an accomplishment (Rappaport Hovav and Levin 1998b; Halliday and Matthiessen 1999, pp.471–3; Declerck et al. 2006; Davidse and Olivier 2008), as shown in examples (211) and (212).

(211) *Why are you walking?* – activity (appendix two, line 1956)
(212) She walked to the rear of the car – accomplishment (appendix two, line 1960)

We can explore the differences in lexical aspect with a hierarchal cluster analysis (visualized in the dendrogram in Figure 4-11). As described in section 4.3.2.3, agglomerative clustering can be used to explore the extent to which individual verbs display (dis)similar features (Levshina 2015, p.310). In Figure 4-11, the most similar the verbs are in the situation types that they share, the closer they are in distance. Dendrograms of this agglomerative clustering are interpreted from the branches to the root as opposed to the other way round (Levshina 2015, p.309). The most similar verbs are *mediate* and *stare*, followed closely by *converse*, *frown*, and then *compete*. The motion verbs *climb, jog* and *walk* are clustered together separately, with *jog* and *walk* showing the most similarities. Finally, *resign* and *sneeze* are clustered together and while we might think of them as semantically close as they are both punctual, they were likely clustered together as they display different situation types from the rest. According to this cluster analysis, the motion verbs are regarded in one category, and the other intransitives (besides *sneeze* and *resign*) are considered in another.
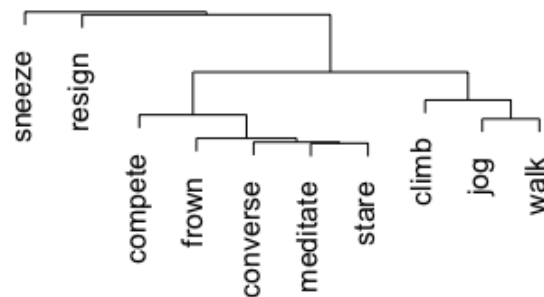
Figure 4-11: A hierarchical cluster dendrogram of ten Behaviours and Intransitive Actions according to their situation types

The verbs studied here were initially categorised as a Behaviour or Intransitive Action according to features described in the literature. As the cluster analysis shows, when focussing on lexical aspect, the verbs within each verb category do not cluster in this binary way. The similarities in situation types of the motion verbs compared to the similarities in other pure intransitive verbs might be grounds for an alternative classification to the Behaviours and Intransitive Actions categories. It might be that the statistically significant difference in the lexical aspect between Behaviours and Intransitive Actions above comes from the difference

in the motion verbs, though for a better understanding of the motion verb influence, future research could involve more datapoints of pure intransitives to see if clusters suggest an alternative method of categorization.

We can consider the results from the Behaviours study (Chapter 3) to picture how a cluster analysis with more verbs would look. We can predict that *hiccup* would join the *sneeze* and *resign* cluster, considering its high frequency as a semelfactive, or potentially even shift *resign* away from *hiccup* and *sneeze* in their own cluster. It is likely that the verbs that were only ever activities (*ponder*, *ruminate*, *talk*, *laugh*, *gossip*, *shiver*) would cluster closely to *converse*, as *converse* was always an activity in both the Behaviours study and this IA study. Considering the (low frequency of) accomplishment instances of *listen*, this verb might be clustered more closely to *compete*, which also had a few instances of accomplishments though much less than the motion verbs. However, this clustering is only taking into consideration one lexico-grammatical feature. The following section considers the five lexico-grammatical features collectively.

4.6 Discussion: A collective look at the lexico-grammatical features of Behaviours and Intransitive Actions

The statistical analyses given above revealed weak effect sizes for comparisons of animacy, intransitivity, and grammatical aspect, indicating similarities in these features between Behaviours and Intransitive Actions. The results were all highly statistically significant ($p < 0.001$) and therefore these lexico-grammatical features could not confidently be considered distinguishing features. As we saw in section 4.5.5 however, lexical aspect was identified a distinguishing feature owing to a strong effect size (0.673) and the difference was highly statistically significant ($p < 0.001$). Having discussed each feature individually, we will now consider all features together, including how they interact in relation to each verb category. The outcome of this discussion will allow us to determine the extent to which the two categories are justified.

Considering all five features, we can visualise the predictability of the Behaviours and Intransitive Actions to explore the best possible route of prediction (see Figure 4-12). As established above, it is probable that instances of states do not belong in either of the Behaviours or Intransitive Actions verb categories, and therefore these (infrequent) instances

in the data were removed (N=55) for this exploration of predictability. Figure 4-12 displays a decision tree which involves three predictive decisions, where lexical aspect emerges as the first most predictive feature followed by animacy. Each split indicates a statistically significant difference (p <0.001). The root node is concerned with the lexical aspect distinction: if the situation type[21] of a given instance is accomplishment or culmination (right branch), then the predicted result is an Intransitive Action (the bin shaded light grey in Figure 4-12). If not accomplishment or culmination, then the left branch is followed and semelfactive becomes predictive: if a given instance is semelfactive, then the predicted result is a Behaviour (the bin shaded dark grey in Figure 4-12). At this point, if the situation type is not semelfactive, lexical aspect is no longer a predictive factor and animacy differentiates the two categories: if inanimate, then the predicted result is Intransitive Action (33%), and if animate it is most likely a Behaviour (67%). Above each bin, labelled next to 'n' in parentheses, is the number of instances in that node (Levshina 2015, p.295). For example, node 3 contains 250 observations, all of which are Behaviours.
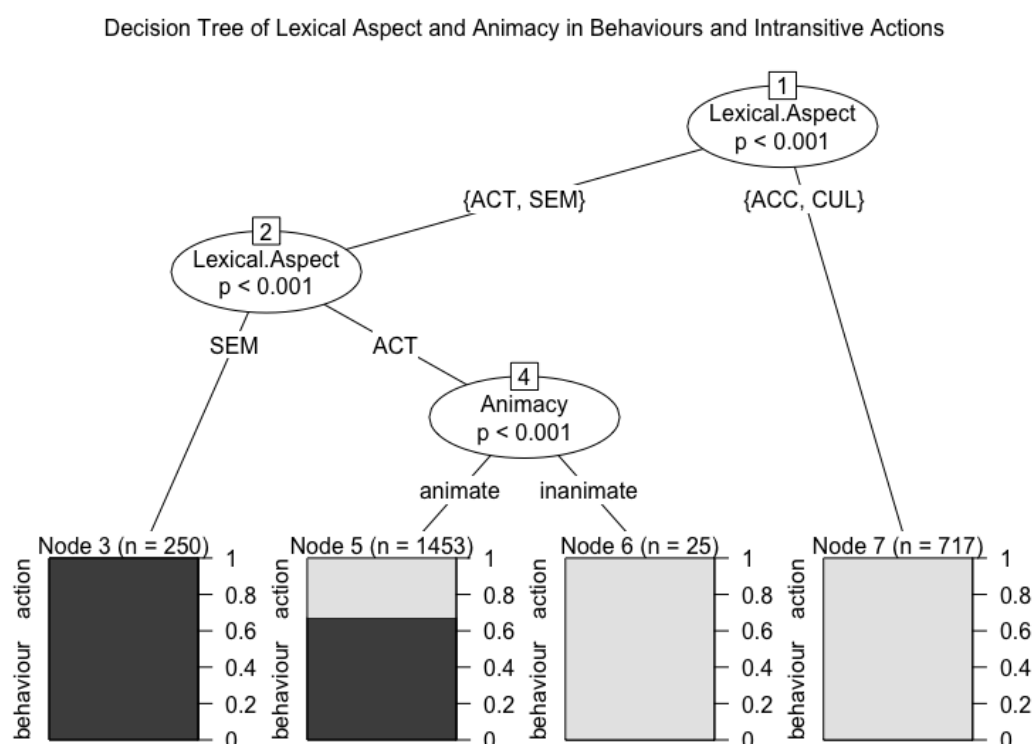
Figure 4-12: A decision tree splitting Behaviours and Actions into groups depending on lexical aspect and first participant animacy

---

[21] In Figure 4-12, situation types are abbreviated to their first three letters (e.g., *ACC* represents accomplishment).

From this decision tree we can deduce that a combination of lexical aspect and animacy are the best determiners in helping to differentiate Behaviours and Intransitive Actions. Lexical aspect was the strongest determiner as it was the only feature found to separate the whole set of pure intransitives, which allowed us to conclude with a high degree of confidence that pure (unergative) intransitive accomplishments[22] or culminations are not Behaviours. Animacy was another feature that helped to differentiate Behaviours and Intransitive Actions, but this differentiation only concerns activities and its effects might need further attention for more conclusive results. Lexical aspect combined with animacy are not absolute determiners of each category, considering both Behavioural and Intransitive Action verbs can occur as activities with an animate subject. However, these results do show that once the states have been taken out of the picture (as outlined above), Intransitive Action verbs are far more likely to have inanimate subjects than Behaviours, and there is a greater tendency for animate subjects to occur with Behavioural verbs.

Whilst these regression results indicate that Behaviours and Intransitive Actions are two valid categories to a certain extent, we might consider that all atelic durative situations (activities) that are intransitive and have an animate subject should be classified together, for example as Behaviours. Though not at the forefront of this thesis, we can consider what the classification would look like with ergative intransitives. As a reminder, intransitive ergatives have transitive alternations (O'Grady 1980, p.57; Davidse 2011) whilst pure intransitives do not (see section 2.1.1). Ergatives are typically telic situations (we shall return to this in Chapter 5) and occur with inanimate subjects much more often than unergatives (Perlmutter 1978), such as *the ice melted*, and so according to the suggestion above, would be classified more often under Intransitive actions.

An interesting proposal in relation to Systemic Functional Linguistics (SFL) process types is to consider that atelic intransitive animate material processes converge with behavioural processes, i.e., for them to be treated as behavioural. The combination of animacy and lexical aspect as potentially determinative is in line with Halliday's (1994) process type classification in SFL where a set of features (as opposed to only one) is used to identify a process type.

---

[22] In the Behaviours study, five instances of *listen to* were accomplishments. The results here suggest that these instances are less typical of Behaviours and potentially are more action-oriented. The verb *listen* was not selected in this study as it wasn't as prototypical as other verbs (see section 3.4). No culminations were found as Behaviours in either study.

However, what differs here is the inclusion of lexical aspect as a contributing distinguishing feature, as lexical aspect has, to the best of my knowledge, rarely been considered in relation to process types (cf Halliday and Matthiessen 1999 for an introductory discussion) and is not currently considered in their determining criteria. Expanding the five semantic behavioural sub-types to include a sixth 'physical' behavioural process could resolve issues of semantic overlaps with experiences such as *dancing*, *swimming*, *fighting* etc., (as outlined above and in section 4.2.1). Removing these instances from the material process type would help reduce its current large and diverse nature as compared to other processes, particularly the behavioural process (Matthiessen 1999, p.14; Matthiessen 2015, p.22). As Thompson (2014, p.120) highlights, the current diversity of the material process type can cause difficulties, and therefore reducing this diversity could help to reduce ambiguities in analysis. In some SFL accounts behavioural processes are placed with material processes, as well as verbal and mental processes (cf Matthiessen 1995; Fawcett 2000; Banks 2015; see section 4.2.1), though these classifications seem largely based on the semantics of the verb alone despite Halliday's (1994, p.106) claims that our experiences are "sorted out in the grammar of the clause". For example, Matthiessen (1995, p.251) classifies "active equivalents of inert sensing" under intro-active processes, such as perception (feel, observe, watch) and cognition (meditate, ponder) experiences. Additionally, these accounts, to the best of my knowledge, are not supported with empirical evidence.

4.7 Concluding the exploration of Behaviours and Intransitive Actions

Following the results of the Behaviours study in Chapter 3, this chapter aimed to examine whether Behaviours can be empirically differentiated from Intransitive Actions. The two sub-aims were: to empirically attest the theoretical claims about the lexico-grammatical features of Behaviours and Intransitive Actions; and to determine the extent to which Behaviours and Intransitive Actions can be differentiated (see section 4.2.3). SFL currently classifies these Behaviours and Intransitive Actions (namely behavioural and intransitive material processes) as separate categories, yet this is largely theoretically driven and lacks empirical validity.

This IA study used empirical data to evaluate the validity of the categorization of Behavioural and Intransitive Action experiences. Corpus Pattern Analysis was combined with aspectual analysis, to reveal typical patterns and meanings. In this corpus approach, five lexico-grammatical features were investigated – animacy, (in)transitivity, *that*-complements,

grammatical aspect and lexical aspect – to empirically determine how the lexico-grammatical features of Behaviours compare to those of Intransitive Actions. Whilst there was close similarity in the perfectivity of the two categories, the high percentages of perfective Behaviours (90.6%) and Intransitive Actions (82.6%) were surprising as they did not uphold current claims that these verb types typically occur in the progressive form (Halliday 1994). Lexical aspect was the one feature with a strong effect size and therefore large difference between Behaviours and Intransitive Actions, which was highly statistically significant ($p < 0.001$); Behaviours were not found as accomplishments or culminations and Intransitive Actions were not found as semelfactives. Whilst this finding exposed interesting differences, exploring the features collectively was revealing, suggesting that a combination of lexical aspect and animacy was the best predictor in distinguishing between the two categories. An interesting proposal that arises from the discussion involves viewing all atelic durative situations (activities) that are intransitive and have animate subjects as Behaviours, whilst inanimate pure intransitives, or pure intransitive accomplishments or culminations, are classified as Intransitive Actions.

Now we have a clearer sense of these two pure intransitive categories, from here it is worthwhile considering these groups collectively in order to round off this multidimensional account of pure intransitives. For example, differences in the lexical aspect of Behaviours and Intransitive Actions were revealed in this study, though what remains unclear is the relationship between particular pure intransitive patterns and their situation types, and how different grammatical structures might link to lexical aspect. Although literature has suggested links between situation types and unergatives (as we will see in Chapter 5), to the best of my knowledge, these links are yet to be established empirically. Investigating the lexical aspect of pure intransitives could contribute to the currently under-defined meaning of an intransitive construction. Thus, the following chapter will help to address this question, in what is the final study of this thesis, namely the 'Intransitives' study.

5. The semantic description of pure intransitive patterns

This chapter presents the third and final study of this thesis, named the 'Intransitives' study. The Behaviours study (see Chapter 3) and IA study (see Chapter 4) focused on the lexico-grammatical features of two typically intransitive verbal categories. Both categories included verbs occurring in 'pure' intransitive constructions, i.e., ones that do not have transitive alternations, unlike ergatives. Ergatives, or unaccusatives, were discussed in section 2.1.1 and they shall be readdressed in this chapter (section 5.1). The results in the previous Behaviours and IA studies established the typical lexical aspect (aktionsart) of the two verb categories, for example the first category 'Behaviours' tended to have activity or semelfactive situation types but no accomplishments or culminations, whereas the second group 'Intransitive Actions' tended to have a wider variety of activities, accomplishments and culminations but no semelfactives. However, what remains less clear is the semantic description of the pure intransitive construction more generally; whilst the previous two studies investigated intransitives, the focus was on different semantic verb categories as opposed to the intransitive construction itself. Thus, the aim of this chapter is to determine empirically what lexico-grammatical properties and semantic features can be associated to the 'pure' intransitive construction. As we saw in Chapter 1 (also see section 5.1 below), there are well-established definitions of transitive and ditransitive constructions that currently exist in the literature, yet a lack of a well-established definition of the intransitive construction, motivating the investigation in this chapter.

First, I shall define the terms 'construction' and 'pattern'. A construction is defined as a "form-meaning correspondence" (Goldberg 1995, p.6), in which the form can extend from a morpheme to larger units of language, such multi-clausal constructions (e.g., the covariational conditional construction) (Goldberg 2003, pp.219-220). Hanks (2004a, p.87) defines verb patterns as including the basic argument/valency structure, as well as relevant subvalency features such as determiners (see section 3.2.2.1 for further explanation). Following these definitions, I will use the term 'pattern' to describe the syntactic form, and 'construction' when the pattern is coupled with its meaning.

This chapter is structured as follows: section 5.1 reminds the reader of intransitivity literature and section 5.2 establishes the current links between intransitivity and lexical aspect. Both

these sections motivate the aim and sub-aims of this study, which are outlined at the end of section 5.2. Section 5.3 presents the methodology of this Intransitives study, including the preparation of the dataset (section 5.3.1) and the data analysis (5.3.2). The results are presented in two parts. Section 5.4 reveals the situation types of the 56 intransitive patterns in this present study. Section 5.5 reveals the situations of intransitive patterns specific to each verb, to identify the extent to which verbal semantics influences the situation type of intransitives. Finally, a discussion of the potential intransitive meaning and the influences of changes in situation types is presented in section 5.6, followed by concluding remarks and considerations of future research.

5.1 A focus on pure intransitives

Whilst pure intransitives are relatively straightforward to define and identify, e.g., one core subject with no transitive alternate or ability to be passivized, the nature of intransitive patterns are generally understudied. As shown in Chapter 1, definitions of the ditransitive and transitive constructions are widely acknowledged and grounded within the literature. Ditransitives constructions are three participant constructions that portray a possessive (*giving*) or cognitive (*teaching*) transfer (Haspelmath 2015, p.20), whilst transitives have two participants and portrays a movement or transfer of a process from one participant to another, such as *eating* or *killing* (Huddleston 1984, p.190; Dryer 2007, p.250). The causative meaning of ergatives/ unaccusatives is also widely established within literature (Keyser and Roeper 1984; Levin and Rappaport Hovav 1995; Davidse and Geyskens 1998; Davidse 2011 to only name a mere few). Whilst ergatives portray external causation (see examples (213) and (214)), pure intransitives portray internal causation (Davidse 2011, p.23) (see example (215)[23]), though this pure intransitive meaning appears to be less widely referenced.

    (213) The ice melted (Keyser and Roeper 1984, p.381)
    (214) The sun melted the ice (ibid)
    (215) John talks (Keyser and Roeper 1984, p.381)

Although exact figures or frequencies of intransitives are hard to come by and difficult to work out, research does indicate their rarity. The XTAG research group reported 1963 verbs that occur in intransitive constructions, 159 intransitive verb particles such as *sign off*, and an

---

[23] These examples have been repeated from section 2.1.1 for clarity.

additional 292 verbs that occur in ergative constructions. In total 2414 intransitive verbs are outlined, though this figure includes verbs that can function both transitively and intransitively, as well as ergatives, and therefore the actual figure of pure intransitive verbs is even lower. The ability for verbs to be used both transitively and intransitively indicates the impracticality of labeling or categorizing verbs as 'intransitive'. The different transitivity uses of a particular verb also highlights how grammar influences or 'liberates' lexical use, a concept put forward by Widdowson (1988). As Widdowson (1988, p.151) states, "grammar is not a constraining imposition but a liberating force: it frees us from a dependency on context and the limitations of a purely lexical categorization of reality." Thus, the grammar "can be seen as a resource for the adaptation of lexis" (ibid).

In contrast to these 2414 intransitives, 4,506 verbs were reported as transitive and require a noun phrase object complement. Additional transitive groups included 548 transitive verb particles and 98 transitive sentential subjects, totaling 5,152 transitives, though it is difficult to tell how many verbs in these are repeated from the initial transitive group. Nonetheless, these figures suggest a dominance of transitive verbs compared to intransitive verbs. Without diverging too far into a diachronic review of intransitives (cf Visser 1963; van Gelderen 2018 for a detailed review), English has lost many pure intransitive verbs; of 223 old English verbs outlined by Visser (1963), over half have become obsolete (van Gelderen 2018, p.56). Some of these have disappeared completely – *ablican* (shine)*, bifian* (tremble / shake)*, cnitian* (dispute) – and some have been "renewed through light verbs and particles or become alternating causative/inochatives or transitives" (van Gelderen 2018, p.56). For example, *dropian* (drop) developed a causative alternation and *ciden* (quarrel) changed from a pure intransitive to transitive. Although, van Gelderen regards verbs with prepositional complements as transitive and whilst the frequency of intransitives renewed with prepositional complements is not clear, they still appear to be relatively infrequent. For example, only seven out of the 81 intransitive verbs were shown as changing to a 'particle verb' (van Gelderen 2018, p.57). Precise reasons for the reduction or change in these intransitives is not clear, though see Lavidas (2013) for a discussion linking the increase of cognate objects to progressive aspect. The intransitive reduction and their implied rarity is perhaps indicative of the lack in literature on an intransitive meaning.

Overall, pure intransitives appear to be infrequent and lack a clear constructional meaning. We now turn to literature concerning pure intransitives and lexical aspect, to explore what is already known about their temporal semantics.

5.2 Pure intransitives and lexical aspect

This section considers the aspectual nature of pure intransitives in terms of lexical aspect and situation type. Lexical aspect is used to shed light on the currently unclear semantic description of pure intransitives. As a central phenomenon to verbal and clausal semantics, lexical aspect is one perspective that could enhance our understanding of intransitive constructional meaning. The term 'clausal' is included here because it is not just the verb that plays a role, "but so do properties of its arguments, as do aspect markers" (Koenig 2016, p.397), which is an important consideration for this present study into pattern meaning (discussed in more detail below).

As seen in sections 2.4 and 3.2.2.2, lexical aspect concerns the inherent temporal meaning of situations by lexical verbs and their arguments (Comrie 1976; Smith 1991; Declerck et al. 2006) and can be categorised into five situation types: 'activity', 'accomplishment', 'culmination', 'semelfactive' and 'state'. Each situation type is identified by different criteria, which are summarised in Table 5-1.

Table 5-1: A summary of the features of the five situation types, adapted from van Rompaey (2013)

	Dynamicity and durativity	**Telicity**	**Agentivity**
State	Stative	-	-
Activity	dynamic durative or evolving	-	+
Accomplishment	dynamic durative	+	+
Culmination	dynamic punctual transitional	+	+
Semelfactive	dynamic punctual non-transitional	+	+

The results of the Behaviours and Intransitive Action (IA) studies (see Chapters 3 and 4 respectively) revealed the influence of the lexical verb on situation types, where different

semantic sets of verbs tend to construe certain situations. The Behaviours study included typical psychological and physiological Behavioural verbs, which typically represent activities (85.5% of instances), but also semelfactives (13%), and very rarely accomplishments (1.1%) and states (0.4%). Twelve out of 15 verbs all occurred as only one situation type (*stare, ponder, ruminate, meditate, talk, converse, gossip, frown, laugh, cry, shiver* and *sneeze*), suggesting a potential influence from the verbal semantics. The IA study compared five Behaviours with five Intransitive Actions and revealed an influence of verbal semantics on the situation type: the Behavioural verbs occurred as activities (78.2%), semelfactives (20%) and states (1.8%); whilst the Intransitive Action verbs occurred as activities (40%), accomplishments (35%), culminations (22.2%) and states (2.8%). Influences from features such as prepositional complements and adverbials were crucial to the situation type classification, and therefore lexical aspect was not solely determined by the verb type. As these are two categories of pure intransitives, it is reasonable to expect that activity situation type is dominant in intransitive patterns.

Different lexical aspect features have been linked to the two intransitive verb types 'unergative' and 'unaccusative' (Tenny 1987; Dowty 1991; van Gelderen 2018). As shown in section 2.1.2, unaccusative verbs occur in ergative constructions, and unergative verbs occur in pure intransitive constructions. Unergative verbs are considered atelic (Dowty 1991; van Gelderen 2018, p.10), or in Tenny's (1987, p.264) terms, 'non-delimited' events, as well as durative (van Gelderen 2018, p.32). In terms of situation types, unergative verbs are typically activities, such as *talk* (cf Tenny 1987, pp.17–20; Levin and Rappaport Hovav 1995, p.71). Conversely, unaccusative verbs are considered as telic (Dowty 1991; van Gelderen 2018, p.10), or 'delimited events' (Tenny 1987, p.264). In terms of situation types, unaccusatives are typically accomplishments and culminations (cf Tenny 1987, pp.17–20; Levin and Rappaport Hovav 1995, p.71).

However, there are exceptions to the binary classifications outlined above, which only describe the general nature of the events. For example, Levin and Rappaport Hovav (1995, p.71) bring attention to atelic instances of unaccusative verbs such as *roll* and *bounce* (see example (216)).

(216) The ball rolled for two minutes (Levin and Rappaport Hovav 1995, p.72)

Additionally, unergatives have been shown to represent punctual, telic events, such as *coughing* or *sneezing* when they occur once (Tenny 1987, p.264). Finally, as discussed in

section 4.5.5, complements and adverbials can have a telicizing effect on certain verb types (Davidse and Rymen 2008), which affects the classifications above. As Pustejovsky (1991, pp.34–35) points out, there are lexical accomplishments where the situation type is largely determined by the verb (*build, destroy*), and 'derived' accomplishments where lexico-grammatical elements such as locative complements create a telic shift from activity to accomplishment (see examples (217) and (218)). Levin and Rappaport Hovav (1998a, p.105) state that in these telicizing instances "the verb meaning is built up incrementally", which shows the possibility for unergative intransitive verbs to represent different situation types.

(217) *Mary walked* – activity (Pustejovsky 1991, p.34)
(218) *Mary walked to the store* – accomplishment (ibid)

The status of intransitive states is less clear. Typical stative verbs are generally transitive, such as *love* and *know* (see section 2.4), though we have seen from the previous two studies that they can occur as intransitives, albeit rarely and typically as metaphors. For example, the Behaviours study revealed one state with the implicature 'to want something or perceive someone in a certain way' (see example (219)).

(219) Students look to MMEs as a model (appendix one, line 3)

States are regarded as atelic events, though there is discrepancy in research as to whether they are unaccusative or unergative. For example, those that believe unaccusatives are always telic would consider states as unergative (Zaenen 1987), whilst others allow some exceptions of atelic experiences as unaccusatives, which include states e.g. *continue* (Tenny 1987, pp.261–264).

To conclude, we have seen that internally caused, pure intransitive (unergative) verbs are typically atelic and of the activity situation type, whilst externally caused unaccusative intransitives are typically telic, though there are exceptions to both classifications. However, as far as I am aware these claims have not been widely established empirically. Additionally, whilst the focus of lexical aspect has predominantly been directed towards verbs and their syntactic properties, less attention has been paid to whether the wider fixed intransitive patterns directly relate to specific types of lexical aspect, i.e., how homogenous the intransitive patterns are in terms of situation types. Some constructions have been associated to particular situation types, such as the 'cognate object' and 'way' constructions which are considered

accomplishments due to their objects (Rosen 1999, p.5; Borer 2005, p.47) (see examples (220) and (221) respectively). The direct object *the ballad* in the cognate object construction in (220), as well as *her way to the Met* in the 'way' construction in (221), both have a telicizing effect.

(220) Terry sang the ballad (Rosen 1999, p.5)
(221) Terry sang her way to the Met in 10 years (ibid)

The 'conative' construction is described as atelic (Borer 2005, p.48), representing an activity (see example (222)). It includes a prepositional complement headed by *at*, and semantically does not entail that the event is completed (Levin 1993, p.6).

(222) Margaret cut at the bread (Levin 1993, p.41)

Resultative constructions are also shown to be either accomplishments (see example (223)) or culminations (see example (224)), as they "code a result state as part of their inherent meaning" (Levin and Rappaport Hovav 1995, p.70).

(223) He talked himself hoarse (Levin and Rappaport Hovav 1995, p.70)
(224) The river froze solid (ibid)

Whilst these specific constructions have been linked to situation types, as far as I know there is no widely established empirical evidence associating lexical aspect to pure intransitive patterns. Thus, this chapter aims to empirically establish the extent to which 'pure' intransitives have a semantic description, specifically in terms of lexical aspect. In doing so, the following sub-aims are addressed:

3.1. To empirically evaluate the extent to which lexical aspect can contribute to the inherent meaning of an intransitive construction.
3.2. To examine the degree of variation in lexical aspect within and between intransitive constructions.
3.3. To determine the main influences of the variation in lexical aspect, if any.

The following sections outlines the methodology of this Intransitives study, which describes how the aims above were achieved.

5.3 Methodology for investigating intransitivity in relation to lexical aspect

This section presents the methodology of this Intransitives study. Section 5.3.1 outlines the preparation of the dataset, which makes use of the data from the IA study (see Chapter 4). This section provides justification for using this data, details any data exclusions, and reminds the

reader how the data was analysed. Section 5.3.2 explains the analysis process for this Intransitives study.

5.3.1   Preparation of the intransitive dataset

The current study uses the analysis of the 2500 instances of the 10 pure intransitive verbs (250 each) from the IA study (see Chapter 4), which includes those classed as Behaviours and as Intransitive Actions. All transitive instances were excluded, which includes transitive phrasal and prepositional verbs and the caused-motion construction. Table 5-2 displays the number of intransitive concordance lines of each verb, as well as the number of intransitive patterns of each verb. In total, 2405 instances were obtained. *Climb* was the most polysemous verb with eight patterns, whilst *converse* was the least with one pattern.

Table 5-2: A table displaying the number of intransitive patterns amongst each verb

Verb	Number of Intransitive Patterns	Number of concordances for each verb
Climb	8	203
Compete	2	250
Converse	1	250
Frown	3	250
Jog	2	230
Meditate	3	250
Resign	2	234
Sneeze	2	245
Stare	2	246
Walk	7	247

This dataset was analysed in the IA study using Corpus Pattern Analysis (CPA; Hanks 2004), as well as an analysis of tense, mood, grammatical aspect and lexical aspect (see sections 3.2.2 and 4.3.2). Corpus Pattern Analysis revealed the grammatical patterning and polysemic nature of each verb, as well as the typical patterns of pure intransitives more generally. The lexical aspect analysis classified each concordance line as one of five possible situation types: 'state', 'activity', 'accomplishment', 'culmination' or 'semelfactive'. Instances in which the grammatical aspect interacted with the lexical aspect, such as progressive accomplishments, were analysed according to their main situation type, i.e., an activity-accomplishment as an accomplishment (as justified in section 2.4.8). The focus of this Intransitives study is on the

meaning that is construed in the lexical aspect, as opposed to temporal boundedness of the event (grammatical aspect).

5.3.2 Data analysis of the intransitive patterns

This Intransitives study analysis was carried out in two parts. Firstly, the entire set of 10 verbs was examined collectively and the particular verb was not taken into account. Patterns across the whole dataset were sorted according to their patterning and prepositional attachment. For example, every instance of *[[animate participant]] V on [[(in)animate participant]]* was grouped together. Some patterns were analysed to a finer degree according to their prepositional attachment, to reveal and appropriately group more specific types of intransitive patterns. For example, the pattern *[[animate participant]] V direction* included several different prepositional attachments, such as *[[animate participant]] V to [[inanimate participant]]* and *[[animate participant]] V on [[inanimate participant]]*, which were separated and investigated as different patterns. Patterns were checked against the COBUILD (Francis et al. 1996) to ensure an appropriate categorisation of P-items in the patterns. As we saw in section 4.5.2, the term 'P-items' refers to the group of lexical items that include prepositions, particles, adverbs etc, such as in, on and to (Fontaine 2017). In some cases, the patterns had multiple P-items, as shown in (225) and (226).

(225) I walked back to my seat (appendix two, line 1783)
(226) Monty walks over to her (appendix two, line 1791)

Examples (225) and (226) follow the pattern *[[human]] V (P-item) to [[(in)animate_participant]]* which can also be found in the COBUILD as *V P to n* (P representing 'particle'), such as *our association goes back to the early 1970s* (Francis et al. 1996, p.252). Similar to the COBUILD, my pattern also includes verbs of motion including *jog, walk* and *climb*.

Patterns consist of the general participant type (*animate* or *inanimate participant*). A semantic type displaying *(in)animate participant* indicated that either an animate or inanimate participant could occur in this slot without a change in the meaning of the pattern. A participant was specified when there was only one semantic type in the whole pattern, for example *animate participant: human* was always *human*. Once every instance of each pattern had been analysed, they were grouped and the frequencies of each pattern were calculated to identify their overall

prevalence in the data. Frequencies of situation types were recorded for every instance of every pattern, to identify any that had instances of various situation types (see section 5.4.1) , as well as any patterns that had a one-to-one correlation with situation type (see section 5.4.2).

In the second part of the analysis, the verbs in each pattern were considered to identify the extent to which the verbal semantics influenced the situation type. The frequencies of situation types were identified for every pattern. When a pattern had a one-to-one correlation with just one situation type (see section 5.5.1), analysis moved on to the next pattern. Examples (227), (228) and (229) are used to exemplify this. All of these examples have the pattern *[[animal / human]] V* (pattern 1 of *sneeze*) and every instance was a semelfactive situation type.

(227) I sneezed (appendix two, line 1)
(228) as they sneezed frantically (appendix two, line 2)
(229) Abruptly she sneezed (appendix two, line 3)

In cases where the patterns had instances of more than one situation type (see section 5.5.2), the patterns were explored in more detail to identify reasons behind these differences. This exploration often required an analysis to a finer degree, as outlined above. The examples in (230) and (231) both have the pattern *[[human]] V direction* (pattern 1 of *jog*), but had different situation types (accomplishment and activity respectively). To explore these differences further, the pattern was split according to the prepositional attachment, such as *[[human_1]] V (P-item) to [[human_2]]* (see example (230))*, [[human]] V along [[route]]* (see example (231)) etc., which are referred to as 'micro-patterns'. These micro-patterns are outlined in detail in section 5.5.2.

(230) *Lucy jogged over to dad* – accomplishment (appendix two, line 1531)
(231) *Paul jogs along the trail* – activity (appendix two, line 1576)

The pattern analysis presented in this section was replicated for every pattern of each verb, the results of which are presented in sections 5.4 and 5.5. We now turn to section 5.4 for an evaluation of intransitive patterns and their situation types.

5.4 Results and discussion part 1: situation types of intransitive patterns

In this section, we consider whether it is possible to associate a meaning (in this case, lexical aspect) to a particular intransitive form. This section will firstly provide an overview of situation types in relation to the full set of intransitive patterns. Section 5.4.1 will then address

the intransitive patterns that had multiple situation types, followed by intransitive patterns that had a one-to-one correlation with one specific situation type in section 5.4.2.

A total of 56 intransitive patterns were revealed across the whole dataset. Of these patterns, 60.87% of instances were activities, 16.55% accomplishments, 10.19% culminations, 10.19% semelfactives and 2.2% states (see Figure 5-1). This large majority of activities points to an inherent activity meaning of intransitives, and whilst the frequency of the other situation types shows that activity is not completely representative, there is a clear dominance. In Hank's (2013) sense of norms and exploitations (see section 3.2.2), activities represent norms (the conventional pattern uses), whilst states represent exploitations (the deliberate and creative deviations from established patterns).
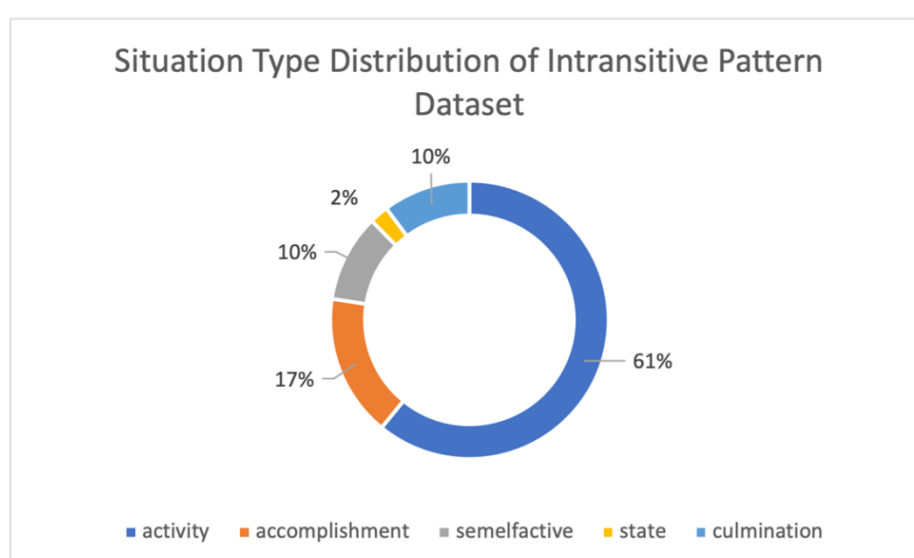
Figure 5-1: The distribution of situation types across the whole intransitive pattern dataset

More specific aspectual features contribute to the definition of intransitive patterns, such as dynamicity (a change rather than homogenous state). Dynamicity is a feature of activities, accomplishments, culminations and semelfactives (Declerck et al. 2006, pp.70–71) and was present in 97.8% of the dataset. This high frequency suggests a strong tendency for dynamicity to contribute as a feature of pure intransitives. Durativity (lasting in time), a feature of activities and accomplishments, was also frequent in the dataset (77.42% of instances) and likewise could be considered a defining feature of this pure intransitive dataset (though not as strong as dynamicity).

Overall, 34 different patterns in the dataset had at least one instance of an activity, 32 different patterns had at least one instance of an accomplishment, nine patterns had at least one state, eight had at least one culmination, and five at least one semelfactive. These figures show that activities occurred across the greatest number of patterns, followed very closely by accomplishments. Thus, activities and accomplishments are the most variable situation types of intransitive patterns in that they are most adaptable to different syntactic forms. Semelfactives were the most restricted, only occurring in five different intransitive forms. The following two sections take a closer look at individual intransitive patterns. We first consider intransitive patterns that have multiple situation types and then discuss reasons for this variation in lexical aspect.

5.4.1 Intransitive patterns that have multiple situation types

In total, 20 out of the 56 intransitive patterns (35.7%) displayed multiple situation types. These patterns are displayed in Table 5-3, alongside their proportions and the verbs that occurred in each pattern. Overall, the situation type was largely determined by verbal semantics, with influences from arguments and adverbials. These influences were anticipated and confirm what has been reported in lexical aspect literature (Mourelatos 1978; Smith 1991; Declerck et al. 2006).

Table 5-3: Intransitive patterns representing multiple situation types

Pattern number	Pattern	Situation types occurring with pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
1	[[(in)animate participant]] V	activity, accomplishment, culmination, semelfactive, state	All verbs	47.5%
2	[[animate participant]] V ON [[(in)animate participant]]	activity, accomplishment, semelfactive, state	climb, compete, frown, jog, meditate, sneeze, walk	4%

Pattern number	Pattern	Situation types occurring with pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
3	[[animate participant]] V IN [[inanimate participant]]	activity, accomplishment, semelfactive	climb, compete, converse, sneeze, stare, walk,	3%
4	[[animate participant]] V INTO [[inanimate participant]]	activity, accomplishment, semelfactive, state	climb, jog, sneeze, stare, walk	3%
5	[[animate participant]] V FOR [[inanimate participant]]	activity, accomplishment	compete	2%
6	[[(in)animate participant]] V {complement}	activity, accomplishment, culmination, semelfactive, state	climb, jog, resign, sneeze, walk	2%
7	[[animate participant: human]] V OUT (OF) ([[inanimate participant]]	activity, accomplishment	climb, jog, stare, walk	1.5%
8	[[animate participant]] V FROM [[inanimate participant]]	activity, accomplishment, culmination	climb, jog, resign, walk	1%
9	[[animate participant: human]] V THROUGH ([[inanimate participant]])	activity, accomplishment	climb, jog, stare, walk	1%
10	[[animate participant: human]] V DOWN [[inanimate participant]]	activity, accomplishment, culmination	jog, walk, climb	1%
11	[[(in)animate participant]] V IN	activity, accomplishment	climb, jog, stare, walk	<1%
12	[[animate participant: human]] V UP ([[inanimate participant]])	activity, accomplishment	climb, jog, stare, walk	<1%
13	[[animate participant: human]] V ACROSS [[inanimate participant]]	activity, accomplishment	climb, jog, stare, walk	<1%
14	[[(in)animate participant]] V UPON [[(in)animate participant]]	activity, state	frown, meditate	<1%
15	[[(in)animate participant]] V OVER [[(in)animate participant]]	activity, accomplishment	climb, frown, meditate, stare	<1%
16	[[animate participant]] V AGAINST [[(in)animate participant]] (IN|FOR [[inanimate participant]])	activity, accomplishment	compete	<1%

Pattern number	Pattern	Situation types occurring with pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
17	[[animate participant]] V AROUND [[inanimate participant]]	activity, accomplishment	climb, jog, stare, walk	<1%
18	[[animate participant: human]] V PAST ([[(in)animate participant]])	activity, accomplishment	jog, stare, walk	<1%
19	[[animate participant: human]] V AWAY FROM [[(in)animate participant]]	activity, culmination	jog, walk	<1%
20	[[animate participant: human]] V BEHIND [[inanimate participant]]	activity, accomplishment	climb, walk	<1%

By far the most frequent pattern was *[[(in)animate participant]] V*, in 47.5% of the dataset (see Table 5-3), namely the 'bare' intransitive. Note that some instances of this pattern did have adverbials, but they were not included as part of the actual pattern (e.g. *[[animate participant]] V adverbial*) because their removal did not affect the implicature of the instance. Out of every instance of this bare intransitive pattern, activity was the predominant situation type (62% of the pattern), followed by semelfactive (20%) and culmination (17%) – see Figure 5-2. Less than 1% of the pattern included accomplishments and states (0.5% and 0.2% respectively). These results reinforce the proposal here that activities are most typical of the intransitive construction, with evidence of lexical semantics influencing the meaning of the construction (see below). Dynamicity was a feature of 99.8% of instances of this pattern, showing that the bare intransitive pattern involves an energy input rather than an unchanging, stative situation (cf Declerck et al. (2006, p.51) for a theoretical description of dynamicity).
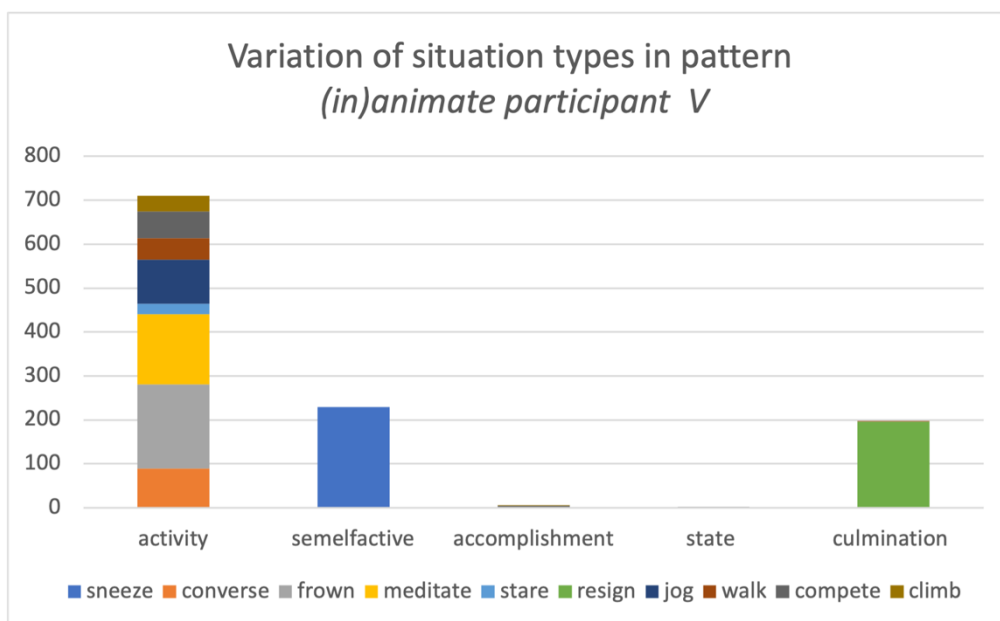
Figure 5-2: The variation of situation types in the pattern '(in)animate participant V' across 10 verbs

The variation in the lexical aspect of this pattern can be accounted for by the semantics of the verb, where different verbs influenced the situation type. For example, every instance of semelfactive occurred with the verb *sneeze,* likewise for culminations and *resign.* This homogenous nature of the two verbs is not surprising considering verbal semantics is widely recognized as having a significant influence on the lexical aspect. For example, van Gelderen (2018, p.19) highlights that verbs like *sneeze* typically represent semelfactives. The few cases of accomplishments were coerced out of the activity situation type into a telic reading, by lexico-grammatical elements in the co-text. For example, the semantics of the event in example (232) is coerced to represent a terminal point by other clausal elements such as *the course*, *the contest, on a course*.

(232) the presumptive favorite will compete whilst hurt (appendix two, line 2148)

As Davidse and Rymen (2008) show, locative complements (such as *on a course* above) have a telicizing effect on atelic situations. The accomplishment results suggest that the base pattern *[[animate participant]] V* is a 'default' activity, and other influences such as clausal elements in the co-text result in a change in the situation type (we shall return to this in section 5.6).

The two states were specific to the verb *compete* (see example (233)), which represented rivalry for attention or popularity (see Table 5-20 in section 5.5.2).

(233) where the forces of supply and demand could freely compete (appendix two, line 2096)

The occurrence of states in this pattern can be attributed to the animacy of the participants; an inanimate subject expresses a state reading and an animate subject has an activity meaning. The influence of animacy is discussed in detail below.

Only 1.6% of bare intransitive instances had an inanimate first participant, of which 16 instances were activities and the remaining two were states. Considering the low frequency of inanimate subjects, we can consider the *[[inanimate participant]] V* pattern an exploitation of the bare intransitive in this dataset. Though, frequencies of situation types of the *[[animate participant]] V* pattern are roughly the same as we saw above with the whole *[[(in)animate participant]] V* pattern (62% activity, 23% semelfactive, 0.5% accomplishment). The main difference was that no states occurred with animate subjects and therefore the *[[animate participant]] V* construction can be considered dynamic. This situation type distribution strengthens the position that the true intransitive meaning is associated with an activity meaning and other factors influence a change in the situation type, such as the verb's inherent semantics. The source of the dynamic event is still an internal force in the animate subject, despite a potential change in situation type. For example, the animate subject *Caron* in example (234) is the internal energy force of the act of *resigning*, in a culmination instance. We return to the discussion of an internal force in section 5.6.

(234) Caron resigned last month (appendix two, line 1480)

From an alternative perspective, of all the instances of activities in the dataset (61% compared to instances of other situation types), the most frequent pattern was *[[animate participant]] V* (59% of all activity instances), which is no surprise considering the large majority of this bare intransitive pattern. This pattern was also the most frequent pattern of all the semelfactive instances (93%), as well as the culmination instances (80%). The high frequency of these two situation types suggests that semelfactives and culminations are typically expressed by one main pattern – *[[animate participant]] V* – when in the intransitive form. Of all instances of accomplishments, the most frequent pattern was *[[animate participant]] V (P-item) [[inanimate participant]])) to ([[[(in)animate participant]])* (21% of all accomplishment instances). We return to a discussion of this pattern in section 5.4.2. Finally, the most typical

pattern of states was *[[inanimate participant]] V (with [[inanimate participant]]) (for [[inanimate participant]])*, though states were so infrequent that there were only 17 instances of this pattern, all with the verb *compete* (see example (233) above). We return to a discussion of this stative pattern in section 5.4.2.

Besides the bare intransitive, several other patterns showed a dominance of one particular situation type, including seven patterns that were predominantly accomplishments (patterns 4, 7, 11, 12, 13, 15 and 19 in Table 5-3), three predominantly activities (patterns 2,5, and 17 in Table 5-3), and one culmination (pattern 8 in Table 5-3). Some examples are displayed in Figure 5-3 – Figure 5-5. Figure 5-3 shows the situation type distribution of the second most frequent pattern *[[animate participant]] V on [[(in)animate participant]]*; activities were most frequent (84%), followed by states (7%), accomplishments (5%) and semelfactives (4%). Situation type appeared to depend on the verbal semantics, where *meditate* and *converse* were always activities, *sneeze* semelfactives, *climb* accomplishments and *frown* states (see examples (235) and (236)).

(235) *I meditated on the nature of "The Enemy"* – activity (appendix two, line 973)
(236) *The EU frowns on the idea* – state (appendix two, line 973)

Figure 5-3: Situation type distribution of instances of the pattern 'animate participant V on (in)animate participant'

Figure 5-4 displays a pattern with a majority of accomplishments (66%) – *[[animate participant]] V into [[inanimate participant]]*. These instances of accomplishments occurred with the motion verbs *walk*, *jog* and *climb*, where the locative preposition *into* attached a goal that is reached, telicizing the event – see Declerck et al. (2006, p.60) and Davidse and Rymen

(2008) who also recognise the telicizing effect of locative complements. An example is shown in (237). Twenty percent of instances were activities, which occurred with the verb *stare* (see example (238)), whilst 12% were semelfactives with *sneeze*, indicating the effect of verbal semantics on the situation type. The only state (1%) was a metaphor.

(237) *An attending physician walked into the room* – accomplishment (appendix two, line 1895)
(238) *He stared into his glass* – activity (appendix two, line 1151)
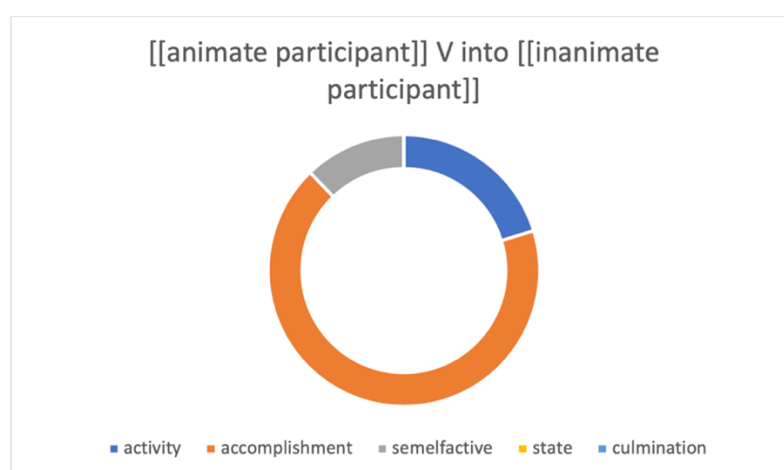
Figure 5-4: Situation type distribution of instances of the pattern 'animate participant V into inanimate participant'

Figure 5-5 displays the situation type distribution of the pattern *[[animate participant]] V from [[inanimate participant]],* which shows a high frequency of culminations (76%). Every instance of culmination included the verb *resign* (see example (239)). Accomplishments (15%) and activities (9%) occurred with the motion verbs *jog* and *climb,* and differences in telicity depended on the type of nominal group in the prepositional phrase. We shall now turn to a discussion of differences in activities and accomplishments.

(239) Holland resigned from the company that bore his name – culmination (appendix two, line 1391)
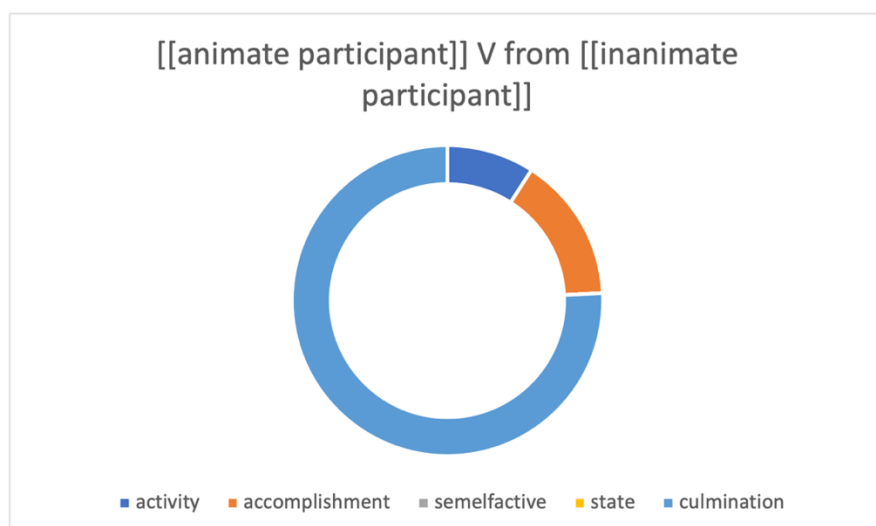
Figure 5-5: Situation type distribution of instances of the pattern 'animate participant V from inanimate participant'

Whilst several patterns showed a dominance of one situation type in its instances, some also displayed a relatively even split (measured in the 40-60% range) between two situation types. The most common split in situation type of a pattern was between activities and accomplishments, occurring in six patterns (patterns 3, 9, 10, 16, 18, 21 in Table 5-3). Examples of these patterns are displayed in Figure 5-6 – Figure 5-8. Figure 5-6 displays the distribution of situation types across instances of the pattern *[[animate participant]] V in [[inanimate participant]]*. Fifty-six percent of instances were activities, 43% were accomplishments and 1% were states.

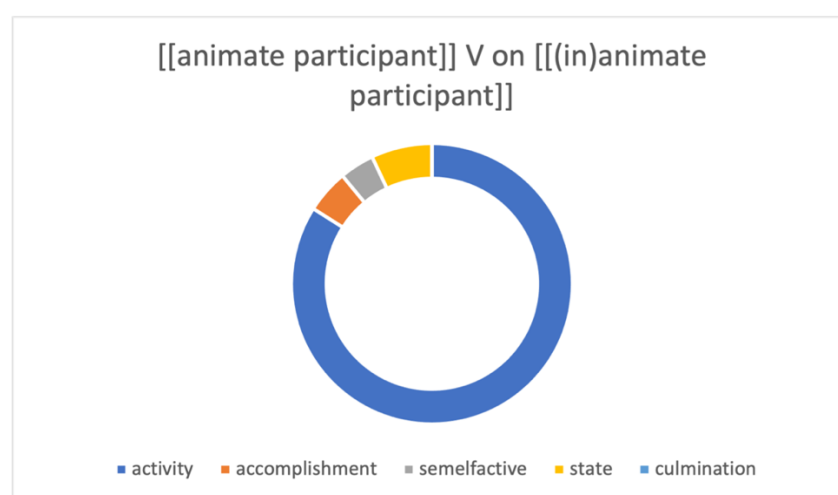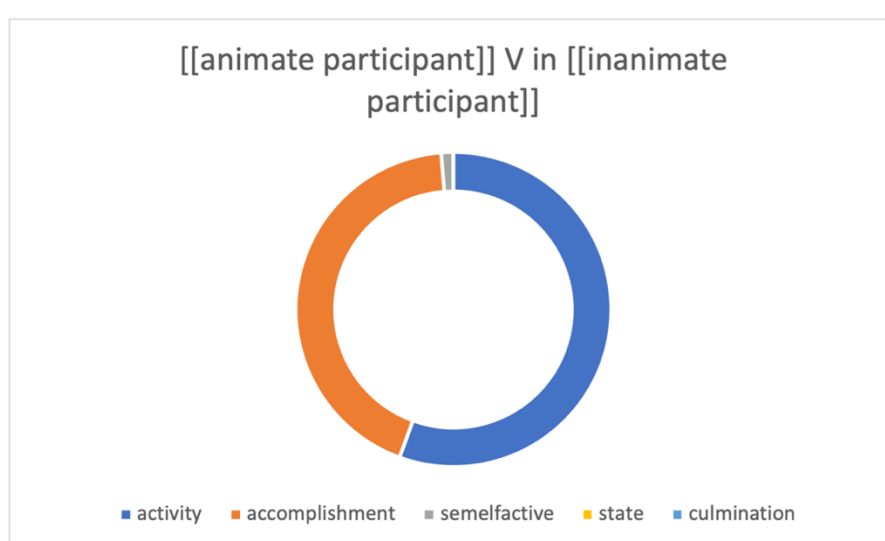**Figure 5-6: Situation type distribution of instances the pattern 'animate participant V in inanimate participant'**

Figure 5-7 displays the distribution of situation types across instances of the pattern *[[(in)animate participant]] V over [[(in)animate participant]]*. Fifty-seven percent of instances were activities and 43% were accomplishments.
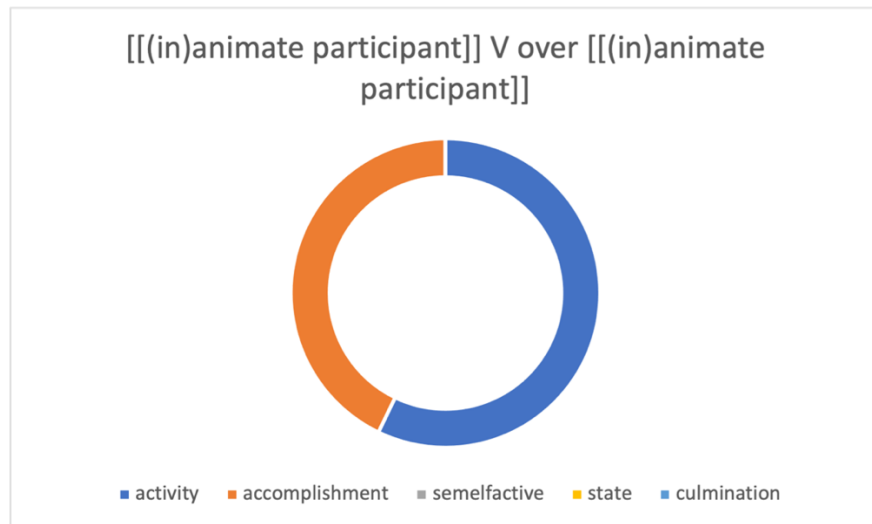
Figure 5-7: Situation type distribution of instances the pattern '(in)animate participant V over (in)animate participant'

Figure 5-8 displays the distribution of situation types across instances of the pattern *[[animate participant:human]] V through [[inanimate participant]]*. Fifty-four percent of instances were accomplishments and 46% were activities.
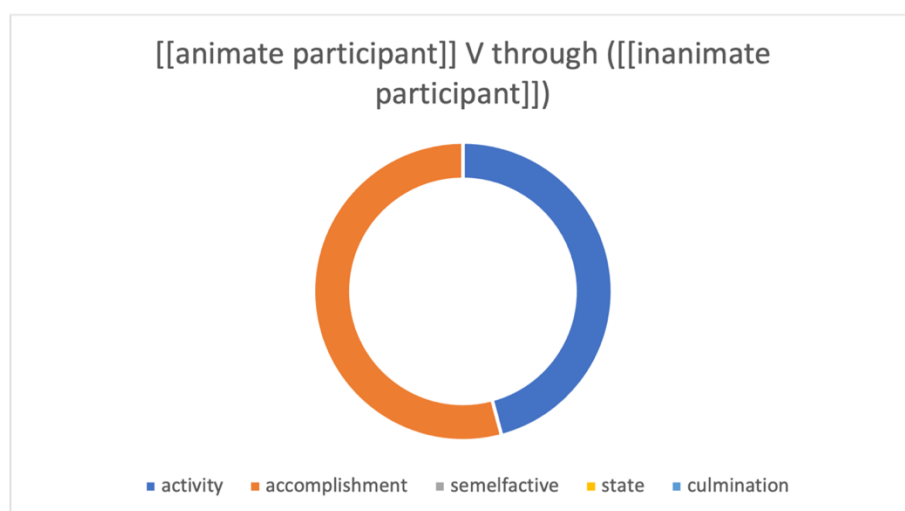
Figure 5-8: Situation type distribution of instances the pattern 'animate participant:human V through inanimate participant'

There were two main reasons for the divide between activity and accomplishment situation types, which shall be exemplified using this last-mentioned pattern *[[animate participant:human]] V through [[inanimate participant]]*. The first influence was from verbal semantics, where a change in the verb affected the situation type. An example is shown in (240) where a substitution of the verb changes the situation type. The example in (240a) is a telic situation of someone walking through a door. Exchanging the main verb *walk* for *stare* (240b)*,* creates an atelic situation and therefore an activity. This change in telicity depending on the verb is highlighted in example (241), which shows an atelic instance of *stare* attaching a prepositional complement headed by *through*.

> (240) a) *She walked through the door* – accomplishment (appendix two, line 1786)
> b) *She stared through the door* – activity
> (241) *Celli stared through the crystal panes* – activity (appendix two, line 1158)

The second predominant influence on telicity was dependent on the semantic type of the noun phrase in the prepositional complement. The telic accomplishment in (240) contrasts to the activity in (242) because of differences in the semantic type of *the door* and *the proposed new building*. However, an alternative influence in these instances might be in the semantics of *through*, which can cause atelic and telic readings (Zwarts 2005, p.741). For example, there is a linear path in (240) "first path goes *into* landmark and second path *out of* from the landmark" (Zwarts and Gärdenfors 2016, p.130), where the landmark is *the door* (cf Langacker (2008) for details on path and landmark). In example (242), "the relevant location applies to the whole path" (Zwarts 2005, p.768) where the location is *the proposed new building*. It should be highlighted here that prepositions such as *through* "behave ambiguously" (Zwarts 2005, p.741) and therefore their lexical aspect readings can be difficult to interpret. Mass or count nouns also had an influence on the telicity of the clause, where count nouns express repetition in the event (*fallen trees* in (243)), which is indicative of atelic events whilst mass nouns construe telicity (*safety railing* in (244)).

> (242) *[They] walk together through the proposed new building* – activity (appendix two, line 1796)
> (243) *They… climb over fallen trees* – activity (appendix two, line 2494)
> (244) *He climbs over the safety railing* – accomplishment (appendix two, line 2263)

The event in example (244) ends after *he* climbs over *the safety railing* whereas *fallen trees* in example (243) represents multiple climbing events without an inherent end point. As Rosen

(1996, p.5) and Van Rompaey (2013, p.204) point out, the internal characteristics of a noun phrase, such as plural count nominals, influences telicity and situation types.

This section has outlined the intransitive patterns that had different situation types in different instances. The following section turns to the intransitive patterns that were 'homogenous' in lexical aspect, i.e., always had the same situation type.

5.4.2   One-to-one correlations between intransitive patterns and situation types

As stated above, this section outlines the intransitive patterns where every instance of a given pattern represented only one situation type, indicating a one-to-one correlation of a pattern and a situation type. Overall, 14 patterns had a one-to-one correlation with activities (see Table 5-4), 14 other patterns with accomplishments (see Table 5-6), four patterns with states (see Table 5-7), and three patterns with culminations (see Table 5-8). There were no intransitive patterns that only ever occurred as semelfactives. As highlighted in the tables, several patterns were very low in frequency. All patterns that were homogenously either states or culminations occurred less than 1% of the time. This section discusses the patterns with a frequency above at least 1%, as anything less was deemed less representative of language use (those less than 1% are listed below for reference though not discussed). As Hanks (2013, p.141) points out, "appropriate levels of generalization have to be chosen at every step". The three patterns that are discussed in this section include: *[[animate participant]] V at [[(in)animate participant]]* (9% of dataset – see Table 5-4); *[[animate participant]] V with [[(in)animate participant]]* (7% of the dataset – see Table 5-4); and *[[animate participant]] V (P-item ([[inanimate participant]])) to ([[(in)animate participant]])* (3.6% of the dataset – see Table 5-6). This last pattern might appear to be at a low percentage for generalisation (3.6%), though Hanks (2017, p.8) claims that frequencies as low as 3.2% "can be regarded as a pattern (a norm or convention)" as opposed to an exploitation.

The most common pattern with a one-to-one correlation with activities was *[[animate participant]] V at [[(in)animate participant]]* (9% of dataset – see Table 5-4). This pattern was found in the COBUILD, which provides 15 semantic groups of verbs that occur within this pattern (Francis et al. 1996, pp.165–169), such as the 'chew group' (*chewing*, *gnawing*), the 'wink group' (*blinking*, *nodding),* and the 'shout group' (*screaming*, *whistling*). In a word sketch search (a search of a word's grammatical and collocational behaviour; Kilgarriff et al.

2010) in the English Preposition Corpus (Litkowski 2017), I found that the preposition *at* occurs most often with the semantic verb classes 'verb.body' (*smile*), 'verb.communication' (*converse*) and 'verb.perception' (*stare*) (Kilgarriff et al. 2014). This preposition word sketch only revealed the most typical verb collocations and did not display the typical patterns or the animacy of the subject, though we can infer from the verb types that they were likely to be animate. The results in this present study provide an alternative perspective, suggesting that we can assume the verb instances within this pattern will represent activity situation type with an animate subject.

Table 5-4: Intransitive patterns that had a one-o-one correlation with 'activity' situation type

Pattern number	Pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
1	[[animate participant]] V AT [[(in)animate participant]]	compete, frown, stare	9%
2	[[animate participant]] V WITH [[(in)animate participant]] (FOR | ABOUT | IN [[inanimate partcipant]])	compete, converse	7%
3	[[(in)animate participant]] V TOWARD [[(in)animate participant]]	climb, jog, walk	<1%
4	[[animate participant]] V ABOUT [[(in)animate participant]]	converse, meditate	<1%
5	[[animate participant: human]] V ALONG ([[inanimate participant]])	jog, walk	<1%
6	[[animate participant: human]] V AWAY	jog, walk	<1%
7	[[animate participant: human]] V BY [[(in)animate participant]]	jog, walk	<1%
8	[[animate participant: human]] V BACK	climb, jog, stare	<1%
9	[[animate participant: human_1]] V AFTER [[animate participant: human_2]]	jog, walk, stare	<1%
10	[[animate participant: human]] V AHEAD	stare	<1%
11	[[animate participant: human]] V ON	jog, meditate, walk	<1%
12	[[animate participant: human]] V OFF	jog, walk	<1%
13	[[animate participant: human]] V AROUND	walk	<1%
14	[[animate participant: human]] V [reflexive]	meditate	<1%

The pattern *[[animate participant]] V with [[(in)animate participant]]* was the second most frequent pattern with a one-to-one correlation with activities (7% of the dataset). Interestingly, the situation type changed when the first participant was inanimate. Thus, these patterns

correlated with a specific situation type depending on the semantic type of the subject. Both patterns are outlined in Table 5-5.

Table 5-5: A comparison of two patterns including a '-with' preposition attachment

	[[animate participant]] V WITH [[(in)animate participant]]	[[inanimate participant]] V WITH [[(in)animate participant]]
Situation Type	Activity	State
Example	*How do I compete with longer players?* *(appendix two, line 2032)*	*Could the singing compete with the acting?* *(appendix two, line 2197)*

Table 5-5 compares the two patterns *[[animate participant]] V with [[(in)animate participant]]* and *[[inanimate participant]] V with [[(in)animate participant]],* showing that instances with animate participants in subject position were activities, whilst inanimate subjects were states. The same verb (*compete*) is used in both examples to highlight the difference in semantic types as opposed to verbal semantics, though *converse* was also found in the animate pattern too. The example *How do I compete with longer players?* (appendix two, line 2032) has an inherent dynamicity and durativity, referring to a golf match. Contrastively, the second example *Could the singing compete with the acting?* (appendix two, line 2197) is stative in referring to two inanimate participants that rival each other for attention or popularity (see the implicature of the pattern in section 4.4.2.4) Replacing *singing* and *acting* for two animate participants, for example *Could the children compete with the adults?*, infers a dynamic situation and therefore an activity over a state. This might evoke a habitual reading (depending on the lexico-grammatical elements in the co-text), which overlays the lexical aspect i.e., a habitual activity (see section 2.4.8).

Further investigation into these patterns in Table 5-5 could help to reveal whether these findings hold in a larger dataset; this is especially necessary, as the pattern *[[inanimate participant]] V with [[(in)animate participant]]* was of such low frequency (<1%). The COBUILD does not distinguish between the animacy of subjects in the two patterns outlined above, but rather outlines the pattern combination *pl-n V* (*pl-n* meaning plural noun group) and *V with n* (Francis et al. 1996, p.455). These patterns occur with 'reciprocal verbs', which "participate jointly in an action or event" (Francis et al. 1996, p.455). For example, *I conversed with nannies from Ghana* (appendix two, line 312) could also be represented as *they conversed.* The pattern combination is said to belong to several verb group meanings, including the 'talk

group', 'fight group' and 'collaborate group' (ibid, p.456). In my data, the two verbs that overlap with the 'talk' and 'fight' group are *converse* and *compete* respectively, which occurred in the pattens in Table 5-5. Additionally, Levin (1993, pp.62–63) describes the 'simple reciprocal alternation (intransitive) + p=with', which represents intransitive alternations that can occur with or without a prepositional complement, headed by *with*. The alternations are *NP1 V [pp P NP2]* and *[np NP1 and NP2] V*, which tend to involve verb classes such as 'talk', 'chitchat', 'correspond', and 'meet' verbs. Though, neither of these accounts provide examples for differences in animacy of the first participants, and neither expand on the semantics of verbal groups other than listing them. Therefore, differences like those in Table 5-5 currently go unaddressed and indicate an area of potential future research (we shall return to this in section 5.6).

The most frequent pattern that had a one-to-one correlation with accomplishments was *[[animate participant]] V (P-item ([[inanimate participant]])) to ([[(in)animate participant]])*, which occurred in 3.6% of the dataset (see Table 5-6).

Table 5-6: Intransitive patterns that had a one-to-one correlation with 'accomplishment' situation type

Pattern number	Pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
1	[[animate participant]] V (P-item ([[inanimate participant]])) TO ([[(in)animate participant]])	climb, jog, walk	3.6%
2	[[inanimate participant]] V ((FROM) [[inanimate participant]]) TO [[(in)animate participant]]	climb	<1%
3	[[animate participant]] V ONTO [[(in)animate participant]]	climb	<1%
4	[[animate participant: human]] V ON/ABOARD ([[(in)animate participant]])	climb	<1%
5	[[animate participant: human]] V OVER	jog, walk	<1%
6	[[animate participant: human]] V OFF (OF) ([[(in)animate participant]])	climb	<1%
7	[[animate participant: human]] V DOWN	climb, jog	<1%
8	[[animate participant]] V INSIDE	climb, jog	<1%
9	[[animate participant: human]] V UNDER [[inanimate participant]]	climb	<1%
10	[[animate participant: human]] V ATOP [[inanimate participant]]	climb	<1%
11	[[(in)animate participant]] V ABOVE [[inanimate participant: numerical_value]]	climb	<1%

Pattern number	Pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
12	[[animate participant: human_1]] V ON TOP OF [[animate participant: human_2]]	climb	<1%
13	[[animate participant: human]] V OUTSIDE	jog, walk	<1%
14	[[animate participant: human_1]] V IN FRONT OF [[animate participant: human_2]]	jog	<1%

This one-to-one correlation with accomplishments was expected with motion verbs, as prepositional phrases headed with *to* telicize the event by adding a goal (Levin 2000, p.416; van Gelderen 2018, p.21). An example is shown in (245).

(245) *I jog to Uncle Stan's house* and start feeding the dogs (appendix two, line 1611)

When the first participant of this pattern changed to inanimate (*[[inanimate participant]] V to ([[inanimate participant]]*) in Table 5-3*, most instances were still accomplishments (83%, see example (246)), but there was also one culmination (albeit a metaphor) and one state. The stative situation (see example (247)) is an instance of 'fictive motion', in which the literal sense ascribes a motion to a typically motionless participant (*the twin Brook Trail*), whilst metaphorically ascribing the orientation of the trail participant (cf Talmy 2000 for an explanation of Fictive Motion). As Hanks' (2013, p.99) claims, the most basic categorisation of motion verbs "as process verbs can be exploited to form verbs of state". The intransitive state in (247) shows how semantic types can influence the situation type of intransitive patterns, in this case with the inanimate subject *the twin Brook Trail*.

(246) By 2005, the figure should climb to 26 percent (appendix two, line 2292)
(247) The twin Brook Trail then climbs to Galehead hut (appendix two, line 2276)

Despite the homogeneity of accomplishments in the pattern *[[animate participant: human]] V to ([[(in)animate participant]])*, the Behaviours study revealed instances of this intransitive pattern with different situation types. For example, instances of the patterns *[[human]] listens to [[(in)animate_participant]]* and *[[human_1]] talks to [[human_2]]* were activities. We can expect a similar occurrence with the pattern *[[animate participant: human]] V about [[(in)animate_participant]]*; whilst the instances of this pattern were homogenously activities in all three studies in the thesis, there are potential cases where a change in the verb would lead to a different situation type. For example, I extracted a random sample of this pattern with the

verb *know* and analysed it for lexical aspect (see examples (248) – (250)), which all revealed states. As Declerck et al. (2006, p.51) point out, this verb "can only be used to refer to a state".

(248) *what do we know about any of Daddy's criminal history?* – state (COCA: SPOK: CNN_Grace)
(249) *... and you know about business stuff* – state (COCA: MOV: The High Schoolers Guide to College Parties)
(250) *All she knows about Lucas is he has a lot of money and has been very vocal about the President of the United States not getting re-elected* – state (COCA:WEB: goodreads.com)

A corpus query language (CQL) search of *[lemma="know"][word="about"]* in sketch engine revealed 3,737 instances of this pattern, indicating a normal pattern use (in Hanks' terms) of this verb-prepositional complement combination. According to the analysis of situation types in (248) – (250), as well as Declerck et al.'s (2006, p.51) claim above, it is predicted that the 3,737 instances will also construe states. Future research might investigate the homogenous constructions from this Intransitives study in alternative datasets, as there are clear verbal constraints to certain patterns.

Four patterns had a one-to-one correlation with states and three patterns with culminations, though these were of very low frequency and so have not been addressed in more detail here. Future research could investigate a larger dataset of these patterns to consider the culmination and state meanings of particular intransitive patterns. For example, it is noteworthy that all patterns with a state situation type had an inanimate subject, which points to a factor in the situation type meaning (see Table 5-7).

Table 5-7: Intransitive patterns had a one-to-one correlation with 'state' situation type

Pattern number	Pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
1	[[inanimate participant]] V (with [[inanimate participant]]) (for [[inanimate participant]])	compete	<1%
2	[[inanimate participant: route | natural_landscape_feature]] V direction	climb, jog	<1%
3	[[inanimate participant]] V on [[inanimate participant]]	meditate	<1%
4	[[inanimate participant]] V against [[inanimate participant]]	compete	<1%

Additionally, the verb in the patterns of culminations was always *walk* and there were always multiple P-items that followed the verb (see Table 5-8) – these factors would both be worth considering in a future investigation of these intransitive pattern types.

Table 5-8: Intransitive patterns that had a one-to-one correlation with 'culmination' situation type

Pattern number	Pattern	Verbs occurring with pattern	Percentage of pattern instances in dataset
1	[[animate participant: human]] V away with [[inanimate participant]]	walk	<1%
2	[[animate participant: human]] V out the door with [[inanimate participant]]	walk	<1%
3	[[animate participant: human_1]] V out on [[animate participant: human_2]]	walk	<1%

5.4.3   Summarising the aspectual nature of pure intransitives

The results so far have provided a general overview of the typical situation types of the intransitive patterns in this dataset. Section 5.4 showed that activity was the most typical situation type out of all 2405 instances (60.83%), suggesting that activity is an inherent defining feature of intransitives. The high frequency of dynamicity (97.76%) and durativity (77.38%) revealed indicated contributing features to the intransitive meaning. The bare intransitive pattern – *[[(in)animate participant]] V* – was by far the most frequent (47.5%), which also had a majority of activity instances (62% of the pattern) and therefore an inherent activity meaning.

Whilst some patterns had a majority of a particular situation type, other patterns had a more even split in situation types, and the most common split was between activities and accomplishments. Overall, the reason for differences in situation types of one pattern appeared to be owing to two influences: verbal semantics or the noun phrase in the prepositional complement.

Overall, 14 patterns had a one-to-one correlation with activities and 14 patterns also with accomplishments. Four patterns had a one-to-one correlation with states, three patterns with culminations, and no intransitive patterns occurred only as semelfactives. The three most frequent patterns were discussed, which included two patterns with a one-to-one correlation

with activities, and one pattern with a one-to-one correlation with accomplishments (see Table 5-9).

Table 5-9: The three most frequent patterns that had a one-o-one correlation with a specific situation type

Pattern	Frequency within dataset	Situation Type
[[animate participant]] V at [[(in)animate participant]]	9%	activity
[[animate participant]] V with [[(in)animate participant]]	7%	activity
[[animate participant]] V (P-item ([[inanimate participant]])) to ([[(in)animate participant]])	3.6%	accomplishment

Discussion of the results so far has looked at the relationship between lexical aspect and intransitive patterns, regardless of the verb type. The following section investigates each verb and its patterns individually, to give a clearer sense of the extent to which verbal semantics influenced the aspectual meaning.

5.5 Results and discussion part 2: situation types of verb-specific intransitive patterns

We saw above that verbal semantics influenced the situation type of several patterns. For example, instances of the bare intransitive pattern *[[(in)animate participant V]]* were culminations when *resign* was the main verb and semelfactives when *sneeze* was the main verb. Similarly, when *jog* or *climb* were the main verbs in the pattern *[[animate participant]] V into [[inanimate participant]],* the instances were accomplishments, but when the main verb was *stare* the instances were activities. Thus, this section explores the influence of verbal semantics by addressing each verb separately in respect to their intransitive patterns, to shed light on the extent to which verbal semantics plays a role in lexical aspect of intransitive patterns, and whether there are any more influences that are revealed. In doing so, we will address the third sub-aim of this study; to determine the main influences of the variation in lexical aspect, if any.

Two categories of results were identified in this investigation: Category A included cases where each pattern of a given verb had a one-to-one correlation with a specific situation type (see section 5.5.1), whilst Category B encompassed verbs where at least one pattern of each verb represented multiple situation types (see section 5.5.2). As this section makes use of the

intransitive patterns from the IA study results, certain patterns with the same implicature had already been combined. For example, the results in section 4.4.1.4 revealed that pattern 2 of meditate (*[[animate participant]] V on/over/about [[inanimate participant]]*) combined the prepositions *on/over/about* in the same pattern as they construed the same implicature. The pattern format is consistent with the Behaviours and IA studies, such as adjuncts in italics and capitalised prepositions (see sections 3.3 and 4.5 for more detail). The source of implicatures is given by the following key: [P] for Hanks' PDEV, [C] for the COBUILD, [F] for Framenet, [L] for Levin, [OED] for the Oxford English Dictionary and [O] for 'other'.

5.5.1 Category A: one-to-one correlation with a given situation type

For every verb in Category A, each pattern has a one-to-one correlation with a given situation type i.e., each pattern was homogenous in terms of lexical aspect. This category includes six verbs – *sneeze*, *converse*, *frown*, *meditate*, *stare*, and *resign* – which are outlined consecutively below.

Two intransitive patterns occurred with the verb sneeze (see Table 5-10). The first pattern was by far the most dominant (99.2%), besides two instances of cognate object constructions which included modifiers in the cognate object, such as *light* in the example in Table 5-10.

Table 5-10: Intransitive patterns of the verb Sneeze

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal | human]] V	[[animal | human]] makes a sudden, violent, and involuntary expulsion of air and mucus through the nose and mouth [P] E.g. *A man sneezed repeatedly* (appendix two, line 56)	99.2%
2	[[human]] V {sneeze}	[[human]] sneezes in a particular manner [L] E.g. *… and [he] sneezed a light sneeze* (appendix two, line 72)	0.8%

There was no variation of lexical aspect across or within patterns; every instance of each *sneeze* pattern had a semelfactive situation type (see Figure 5-9), i.e., was a dynamic, punctual, non-transitional event that typically represent repetitive sequences. This result was unsurprising as

events like *blinking* and *sneezing* are typical examples of semelfactives (Quirk et al. 1985, p.201; Kearns 2011, p.159).

Figure 5-9: The variation of situation types across 245 intransitive instances of sneeze

One intransitive pattern occurred with the verb *converse* (see Table 5-11, repeated from Table X). Similar to *sneeze,* there was no variation of lexical aspect across or within patterns. Every instance of the *converse* pattern was an activity.

Table 5-11: Intransitive pattern of the verb Converse

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal_group | human_1 | human_group | machine]] V (WITH [[human_2]]) (ABOUT/ON [[anything = topic]]) (IN [[tone | language]])	[[animal_group | human_1 | human_group | machine]] discusses topic (with [[Human_2 | human_group]]), in a particular [[tone | language]] [C] E.g. *John Collins converses with reporters about his versatile offense game* (appendix two, line 470)	100%

Two intransitive patterns were identified for the verb *stare*, as summarised in Table 5-12. A prepositional phrase headed with *at* was most frequent (pattern 1), compared to other prepositional phrases in pattern 2.

Table 5-12: Intransitive patterns of the verb Stare

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V AT [[(in)animate participant]]	[[human]] looks fixedly at [[(in)animate participant]] (mostly human) with his or her eyes wide open [P] E.g. *Scott stares at Jacob* (appendix two, line 1041)	70%
2	[[human]] V *direction*	[[human]] looks fixedly with his or her eyes wide open [P] E.g. *Dexter stared out the room* (appendix two, line 1154)	30%

Again, there was no variation of lexical aspect across or within patterns of *stare*, and every instance of both patterns was an activity (see Figure 5-10).
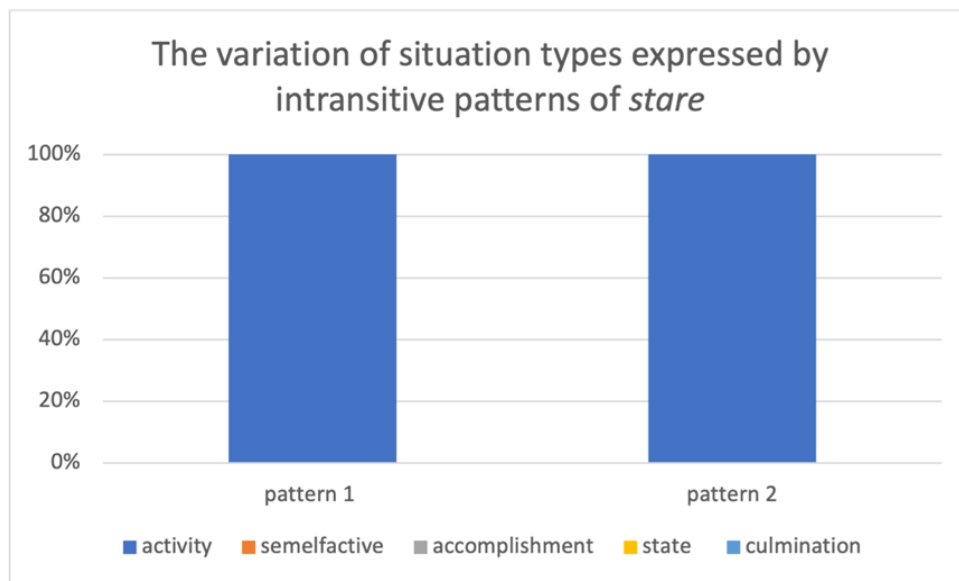
Figure 5-10: The variation of situation types across 246 intransitive instances of stare

Two intransitive patterns were identified for the verb *resign* (see Table 5-13). The first pattern most frequently occurred as a bare intransitive (N=192), but 24 instances included a prepositional phrase headed by *from.*

Table 5-13: Intransitive patterns of the verb Resign

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (FROM [[institution | role]])	[[human]] voluntarily leaves a position of work, of one's own free will [C,F] E.g. *Whitman resigned in May* (appendix two, line 1379)	93%
2	[[human]] V [[role]]	[[human]] gives up a role to another person [C,OED] E.g. *Ensign resigned his leadership post* (appendix two, line 1272)	7%

As with the previous three verbs – *sneeze*, *converse*, and *stare* – *resign* had no variation of lexical aspect across or within patterns; every instance had a culmination situation type (see Figure 5-11), i.e., was dynamic, punctual and transitional with preliminary stages leading up to the instantaneous change.
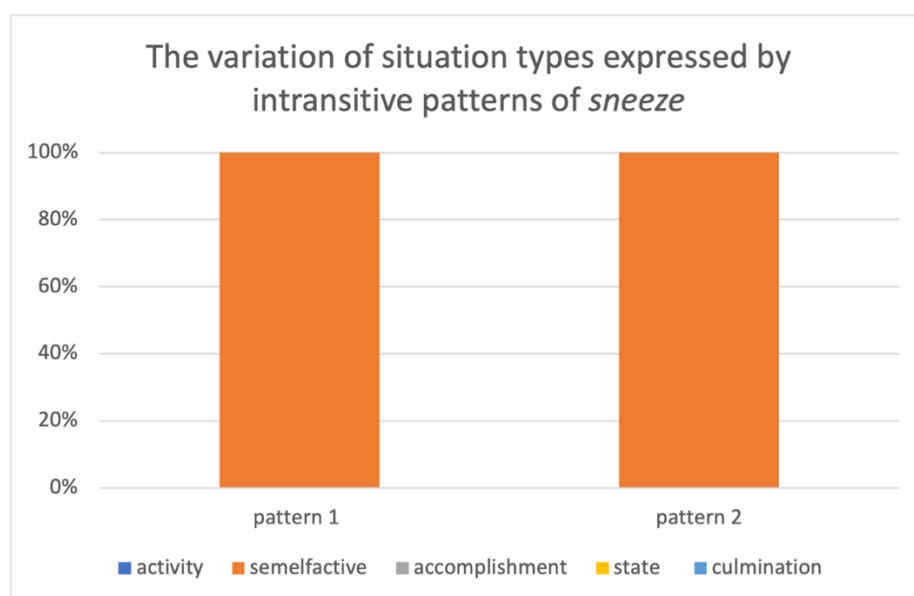

Figure 5-11: The variation of situation types across 234 intransitive instances of resign

Three intransitive patterns occurred with the verb *frown*, as shown in Table 5-14 (repeated from Table 4-6, section 4.4.1.3). Patterns 2 and 3 differed in meanings depending on their prepositional attachments (see below).

Table 5-14: Intransitive patterns of the verb Frown

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] furrows their brows, usually expressing disapproval or displeasure [P] E.g. *The president frowned* (appendix two, line 513)	76.8%
2	[[human]] V AT/OVER [[(in)animate participant]]	[[human]] furrows their brows, expressing disapproval at/over [[(in)animate participant]] [P] E.g. *… and all three frowned at the unwashed plates in the sink* (appendix two, line 611)	17.6%
3	[[human]] V ON/UPON [[(in)animate participant]]	[[human]] disapproves of [[(in)animate participant]] [P] E.g. *International selection committees frown on pre-Olympic negativity* (appendix two, line 572)	5.6%

Every instance of each pattern expressed the same situation type; the two most common patterns had the situation type activity, whilst instances of the third pattern were always states (see Figure 5-12). The distinction between the lexical aspect of patterns 1 and 2 compared to pattern 3 was in dynamicity; in the first two patterns the participant physically moves their brows, whereas in pattern 3 there is a non-dynamic mental thought process. The dynamicity changed between the prepositional attachment of *on / upon* in pattern 3, compared to *at / over* in pattern 2 or no prepositional attachment in pattern 1.
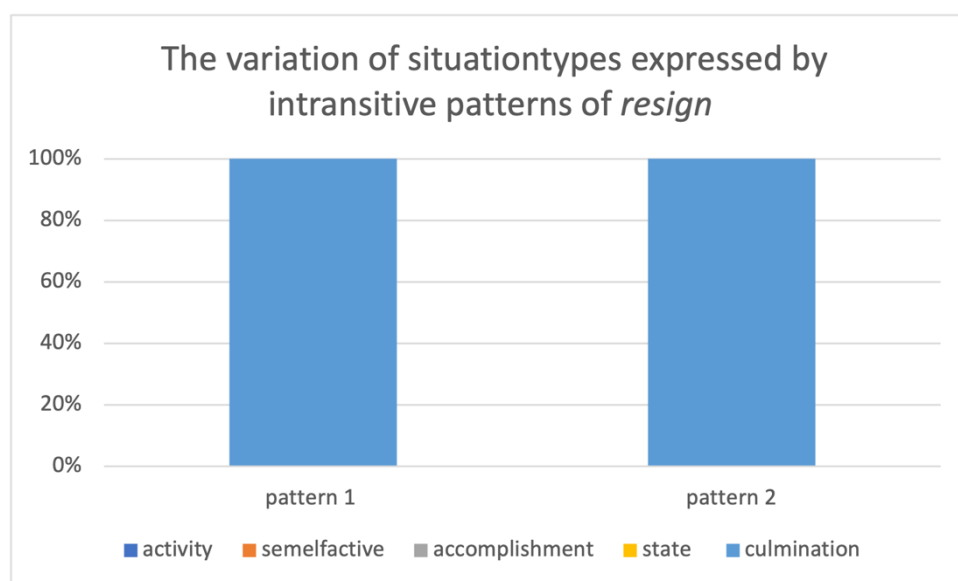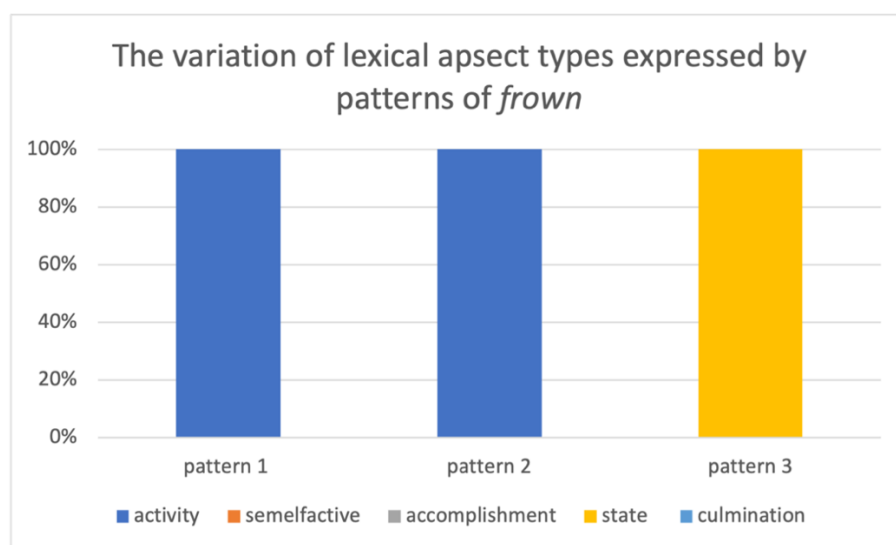

Figure 5-12: The variation of situation types across 250 intransitive instances of frown

Three intransitive patterns occurred with the verb meditate, which are displayed in Table 5-15 (repeated from Table 4-7, section 4.4.1.4). The bare intransitive was most dominant, in 64.8% of instances.

Table 5-15: Intransitive patterns of the verb Meditate

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V	[[human]] focuses their minds on calm thoughts in order to achieve an altered state of consciousness [P] E.g. *A lot of great athletes meditate* (appendix two, line 884)	64.8%
2	[[human]] V ON/OVER/ABOUT [[(in)animate participant]]	[[human]] thinks deeply and at length about [[(in)animate participant]] [P] E.g. *We will meditate on scripture* (appendix two, line 778)	33.2%
3	[[abstract_entity_1 | artifact]] V ON/UPON [[abstract_entity_2]]	[[abstract_entity_1 | artifact]] concerns (is about) [[abstract_entity_2]] [O] E.g. *His tunes meditate on the human need for nature* (appendix two, line 914)	2%

As with *frown*, the two most frequent patterns of *meditate* had a one-to-one correlation with activities, and the third pattern with states (see Figure 5-13). The distinction between patterns 1 and 2 compared to pattern 3 was dependent on the semantic type of the subject; in the first two patterns the subjects provided source of energy, compared to the ongoing process in pattern 3. Examples of the patterns *[[human]] meditate on [[(in)animate participant]]* and *[[abstract_entity_1 / artifact]] meditate on [[abstract_entity_2]]* are shown in (251) and (252) respectively.

(251) Many folks mediated on what it all meant – activity (appendix two, line 859)
(252) His tunes meditate on the human need for nature – state (appendix two, line 914)
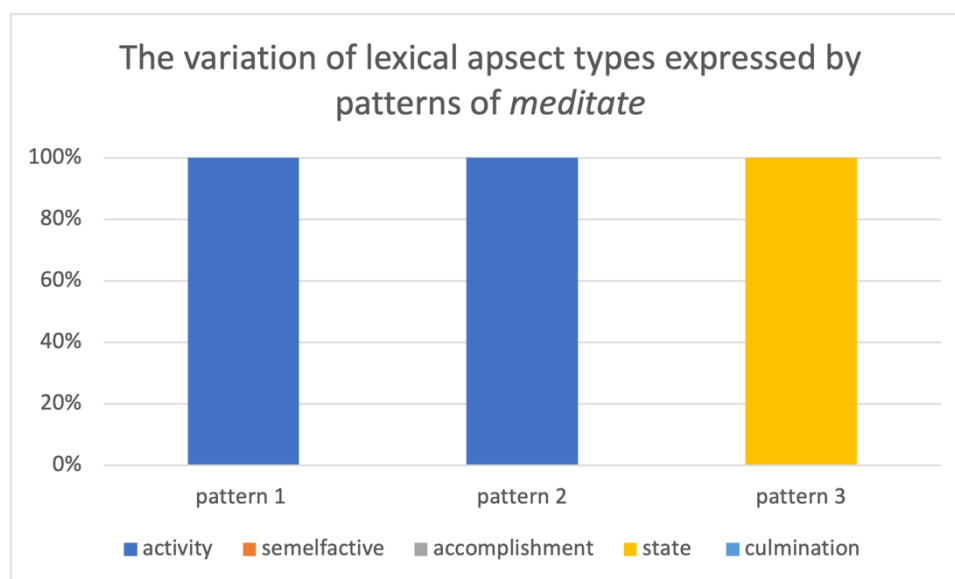
Figure 5-13: The variation of situation types across 250 intransitive instances of meditate

5.5.2 Category B: situation type variation in at least one pattern

In Category B, at least one pattern of each verb had different situation types in different instances, revealing more variation in the lexical aspect. The four verbs included in this category were *jog*, *walk*, *compete* and *climb*.

The verb *jog* occurred in two intransitive patterns (see Table 5-16). The most dominant pattern had an animate subject, *human*, compared to pattern two where a *natural landscape feature* was the subject.

Table 5-16: Intransitive patterns of the verb Jog

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (*adv*(*direction*))	[[human]] runs at a steady, relatively slow pace [P] E.g. *The trio jogs towards the hill* (appendix two, line 1553)	98.2%
2	[[natural_landscape_feature | physical_object]] V *direction*	[[natural_landscape_feature | physical_object]] has a line of course in a particular direction [O] E.g. *where the river jogs south* (appendix two, line 1504)	1.8%

The intransitive patterns of *jog* included three of the five situation types (see Figure 5-14). In pattern 1, there was a relatively close split between activities (63%) and accomplishments (37%), whilst every instance (100%) of pattern 2 was a state.

The variation of situation types expressed by intransitive patterns of *jog*
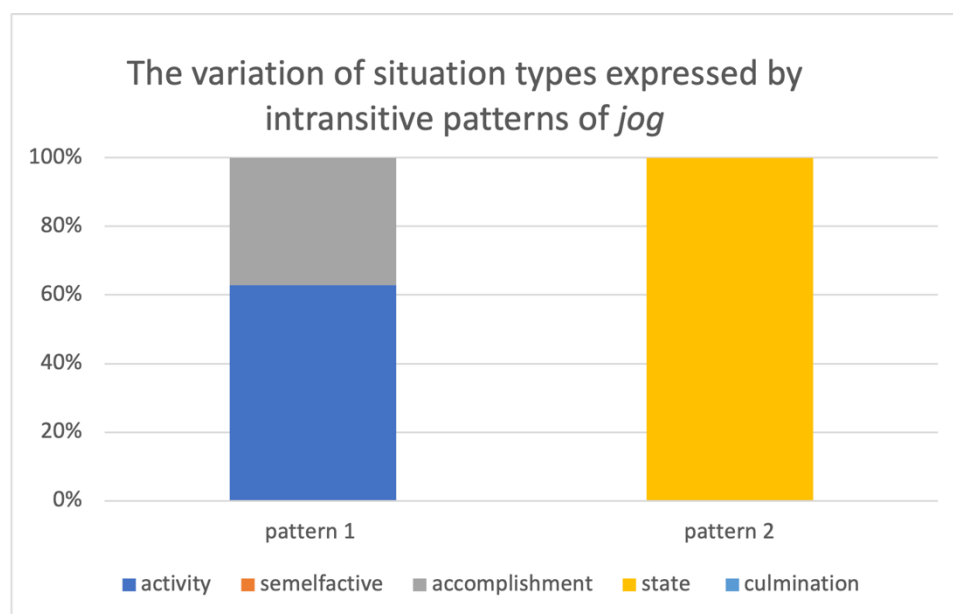
Figure 5-14: The variation of situation types across 225 intransitive instances of jog

Pattern 1 was split into 27 more specific patterns (referred to here as micro-patterns for clarity) to investigate the deviation in activity and accomplishment situation types (see Table 5-17). Every instance of micro-patterns 1-10 were activities, whilst every instance of micro-patterns 11-24 were accomplishments. Three micro-patterns (25-27) had instances of both activities and accomplishments.

Table 5-17: The situation type of each micro-pattern in Pattern 1 of 'jog'

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
1. human V	11. human V ACROSS building/ location/ street	25. human V *adverbial*
2. human_1 V AFTER human_2	12. human V distance (TO vehicle)	26. human V AROUND building_part: room/ natural_landscape_feature/ route
3. human V ALONG (location/ natural_landscape_feature/ route)	13. human V DOWN ((in)animate_participant) (FROM (in)animate_participant) (TO location)	27. human V THROUGH building_part / location/ natural_landscape_feature

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
4. human_1 V AWAY (from human_2/ location)	14. human V BACK ON [something]	
5. human V BY (building)	15. human V OUT OF building_part	
6. animal/human V FROM location / building_part	16. human V OVER	
7. human V OFF	17. human V PAST (artifact)	
8. human V ON	18. human V IN/ INSIDE / (INTO building/ building_part)	
9. human V TOWARDS (in)animate_participant	19. human V UP building_part/ natural_landscape_feature (INTO/ TO location)	
10. human V BACK	20. human_1 V UP ALONGSIDE human_2	
	21. human V (P-item) TO ((in)animate_participant)	
	22. human V OUTSIDE	
	23. human V IN FROM location	
	24. human _1 V IN FRONT OF human_2	

The first of the three micro-patterns with multiple situation types was *[[human]] V adverbial* (pattern 25, Table 5-17); of 30 instances, one was an accomplishment (3.3%) and the remaining were activities (96.7%). The accomplishment (see example (253)) included an adjunct of duration, *another 5 [minutes]*, which indicates an inherent end point after five minutes. As a comparison, the activity example in (254) displays an atelic event. These two examples highlight the telicizing effect of certain durative adjuncts.

(253) Jog another 5 to cool down (appendix two, line 1662)
(254) Usually she jogged alone (appendix two, line 1699)

The second micro-pattern that included instances of both activity and accomplishment was *human V around building_part: room / natural_landscape_feature / route* (pattern 26, Table 5-17). One instance was an activity (25%) and three instances were accomplishments (75%), as shown in (255) and (256) respectively.

(255) …one of the ill-fated astronauts is jogging around a circular room (appendix two, line 1534)

(256) He jogged around the bend (appendix two, line 1729)

Example (255) is atelic, as there is no inherent endpoint to jogging around a room, which contrasts to the telicity of example (256); once someone has jogged around the bend, they cannot jog around it any further. These two examples show that the type of noun phrase in the prepositional complement affected the situation type.

The final micro-pattern with variation in lexical aspect was *human V through building_part / location / natural_landscape_feature* (pattern 27, Table 5-17). One instance was an accomplishment (16.7%) and the remaining five were activities (83.3%). Differences in the prepositional attachment of *through* were the same for *jog* here as they were in the discussed above with *walk* (in examples (240) and (242)), and so this discussion shall not be repeated here.

The second verb in Category B, *walk*, revealed seven intransitive patterns (see Table 5-18). *Walk* had the second highest number of intransitives, behind *climb* (with eight, as we will see below).

Table 5-18: Intransitive patterns of the verb 'walk'

Pattern Number	Pattern	Implicature	Frequency in data
1	[[human]] V (*adv*(*direction*))	[[human]] moves on foot at a fairly slow pace [C,F] E.g. *She was walking towards the glass entrance doors* (appendix two, line 1793)	90%
2	[[human]] V OFF / AWAY	[[human]] leaves a place [C] E.g. *Candace said and walked off* (appendix two, line 1797)	4.4%
3	PV: [[human]] V OFF / AWAY FROM [[abstract_entity]]	[[human]] abstains / withdraws from a situation [C] E.g. *Do I walk away from the case?* (appendix two, line 1997)	1.6%
4	[[human]] V AWAY / OUT THE DOOR WITH [[abstract_entity | money | physical object]]	[[human]] wins a prize or form of competition [C] E.g. *The Hawkses walked away with top prizes* (appendix two, line 1824)	1.2%

Pattern Number	Pattern	Implicature	Frequency in data
5	[[human]] V	[[human]] gets off freely from a criminal charge [OED – slang for walk free] E.g. *In other words, <u>he walked</u>, free to try to rip off other people* (appendix two, line 1966)	0.8%
6	[[human]] V	[[human]] reaches first base automatically after not hitting at four balls pitched outside the strike zone, in a baseball game [OED - jargon] E.g. *He walked* more than he struck out (appendix two, line 1937)	0.8%
7	PV: [[human]] V OUT ON [[human_group]]	[[human]] abandons [[human_group]] [C] E.g. *Anthony Smith walked out on the team last season* (appendix two, line 1920)	0.4%

Every instance of patterns 2, 3, and 6 was an activity and every instance of patterns 4, 5, and 7 was a culmination. Pattern 1 was the only pattern to show variation in situation types – mainly activity and accomplishment, but also one instance of a state and one culmination (see Figure 5-15).
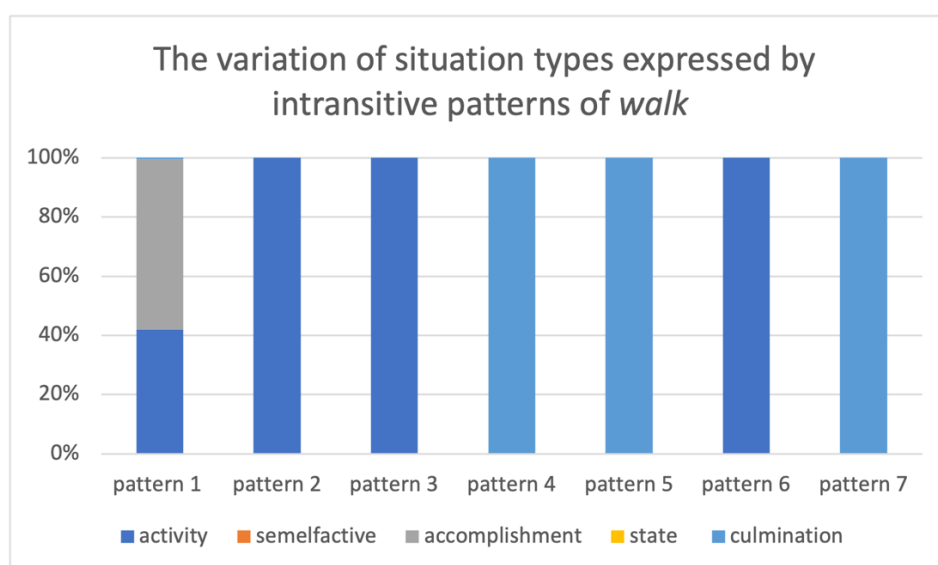

Figure 5-15: The variation of situation types across 247 intransitive instances of walk

In pattern 1, 57.6% of instances were accomplishments, 41.5% activities, 0.45% states and 0.45% culminations. This pattern was split into 24 micro-patterns, which are displayed in Table 5-19. Micro-patterns 1-9 had a one-to-one correlation with activities, 10-21 with accomplishments, and 22-24 each had instances of both activities and accomplishments. The metaphorical instances of state and culmination were regarded as anomalies and therefore were not considered in Table 5-19. For example, the one culmination in micro-pattern 22 implies a metaphorical meaning that the first participant *I* will not marry the other person, which would construe a culmination where marrying is a punctual event (shown by clausal elements in the co-text, such as *you wanted to marry me and now this is what I get?*) (see example (257)).

(257) I can't walk down no aisle with you (appendix two, line 1799)

The other metaphorical instance occurred in micro-pattern 2, where all instances of *human V adverbial* expressed activity except one state as a metaphor (see appendix two, line 1812).

Table 5-19: The situation type of each micro-pattern in Pattern 1 of 'walk'

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
1. animal/human V	10. human V ACROSS inanimate_participant	22. human V DOWN something [one metaphor]
2. human V *adverbial* [one metaphor]	11. human V (ALONG/THROUGH street/ location) (P-ITEM) TO/THROUGH/INTO ((in)animate_participant)	23. human V AROUND inanimate_participant
3. human_1 V AFTER human_2	12. human V distance	24. animal/human V THROUGH (inanimate_participant)
4. human V ALONG (building_part/ natural_landscape_feature/ street)	13. human V FROM building/ location TO location/ vehicle	
5. human V AROUND	14. human V IN/ INTO inanimate_participant	
6. human V BY (building/ human/ natural_landscape_feature)	15. human V OUT (building_part/ location) (OF building / building_part)	
7. human V *location*	16. human V OUTSIDE	
8. human V ON	17. human V OVER	

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
9. human V (UP) TOWARDS (in)animate_participant	18. human V PAST (building_part)	
	19. human V UP (BEHIND furniture)	
	20. human V UP inanimate_participant (TO/TOWARD location/ building)	
	21. weapon V OVER entity TO location	

Three micro-patterns had instances of both activities and accomplishments. The first micro-pattern was *human V down something* (22, Table 5-19), with one accomplishment (11%) and eight activities (89%) (as well as the metaphorical culmination outlined in example (257)). The noun phrase *a back staircase* in the prepositional complement of *Howland will walk down a back staircase* (appendix two, line 1899) had a telicizing affect in the pattern, compared to the atelic instances of *walk(s) down the street* (appendix two, lines 1858 and 1900).

A similar influence occurred in the micro-pattern was *human V around inanimate_participant* (22, Table 5-19), which had two instances of activities and two instances of accomplishments (50% each). Examples of instances with these situation types are shown in (258) and (259) respectively. In example (258), there is no inherent endpoint to walking around *the West End*, compared to walking around a *bed* in example (259).

> (258) I was walking around the West End (appendix two, line 1926)
> (259) …so she could walk around it [bed] more easily (appendix two, line 1825)

Finally, the third micro-pattern of pattern 1 was *[[animal / human]] V through ([[inanimate_participant]])* (micro-pattern 24, Table 5-19), which had seven accomplishments (58%) and five activities (42%) (see the discussion in section 5.4.1 of examples (240) and (242) for reasons behind these differences).

The third verb in Category B, *compete*, represented two intransitive patterns (see Table 5-20, repeated from Table 4-12). The first pattern was highly dominant (91.6%).

Table 5-20: Intransitive patterns of the verb 'compete'

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal_1 | human_1 | human_group | institution_1 | plant_1]] V (WITH / AGAINST [[animal_2 | human_2 | institution_2 | plant_2]]) (FOR [[abstract_entity]]) (IN / AT [[event]])	[[animal_1 | human_1 | human_group | institution_1 | plant_1]] strives to gain or win [[abstract_entity]] with/against [[human_2 | institution_2 | animal_2 | plant_2]] [C,F,OED] E.g. *We are competing with our neighbors* (appendix two, line 2036)	91.6%
2	[[abstract entity_1 | physical_object_1]] V (WITH [[abstract entity_2 | physical_object_2]]) (FOR [[abstract_entity_3]])	[[abstract entity_1 | physical_object_1]] rivals with [[abstract entity_2 | physical_object_2]]) for attention or popularity [O] E.g. *colours compete with each other for attention* (appendix two, line 2064)	8.4%

In pattern 1, there was a division in situation type; the majority of instances were activities (82%), and the remaining 18% were accomplishments (See Figure 5-16). In the second pattern, every instance was a state.
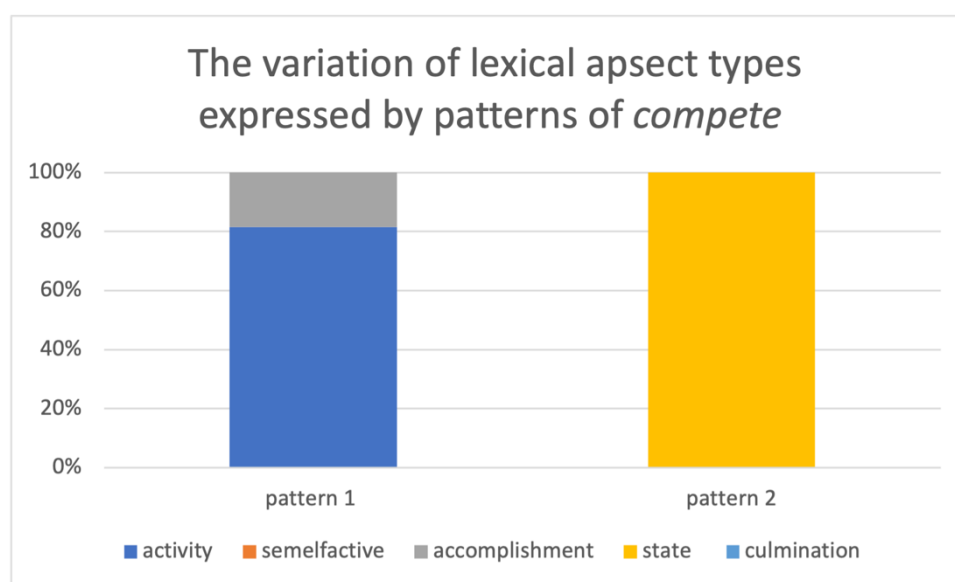

Figure 5-16: The variation of situation types across 250 intransitive instances of compete

Pattern 1 was split into 10 micro-patterns, displayed in Table 5-21. Four micro-patterns (1-4) were only activities and three (6-8) only accomplishments. Five micro-patterns (9-13) had

instances of both activities and accomplishments. The difference between these situation types in each of these five micro-patterns was in the telicity of the event being construed, which was affected by three main factors: context, adverbial attachment, and the type of noun phrase in the prepositional complement.

Table 5-21: A table displaying the lexical aspect of each micro-pattern in Pattern 1 for 'compete'

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
1. human V AT event	6. human V AGAINST human FOR role	9. animate_participant V
2. animate_participant V WITH animate_participant	7. human V AGAINST human IN event	10. human/ institution V *adverbial*
3. animal / human / institution V WITH animate_participant FOR (in)animate_participant	8. human V FOR entity IN event	11. human_1 / institution_1 V AGAINST human_2 / institution_2
4. institution V OVER broadcast		12. animate_participant V FOR (in)animate_participant
5. human/ institution V ON (in)animate_participant		13. human V IN event

Differences of context affected the telicity of micro-patterns 9 and 11. All instances of micro-pattern 9 – *animate_participant V* – were activities (97%) besides one. The single accomplishment was context dependent, referring to someone competing in a telic event (as we saw in example (232) in section 5.4.1). Similarly, micro-pattern 13 – *human_1 / institution_1 V against human_2 / institution_2* – had one instance of an accomplishment (7%) and the remaining were activities (98%), which again differed depending on context.

The adverbials affected the telicity of micro-pattern 12, *human/ institution V adverbial,* which showed a majority of activities (92%) over accomplishments (8%). Examples of an activity and accomplishment are illustrated in (260) and (261) respectively. The to-infinitive *to release one historical drama after another* in (260) represents a continuous atelic event, whilst *to cook the best pork ribs* in (261) is referring to one specific event.

(260) South Korean TV producers competed to release one historical drama after another (appendix two, line 2227)

(261) Teams from across the country and around the world compete to cook the best pork ribs (appendix two, line 2173)

The final influence on telicity was the type of noun phrase in the prepositional complement. In micro-pattern 12 – *animate_participant V for (in)animate_participant* – instances of accomplishments (17%) had telic goals such as *prize money* (see appendix two, line 2161), whilst activities (83%) had ongoing, atelic goals, such as a company continually competing for *exposure* (see appendix two, line 2158). Similarly, the type of event in the next micro-pattern, *human V in event*, determined either an activity (36%) or accomplishment (64%) situation type. Examples are displayed in (262) and (263) respectively.

(262) He competes in iron-man contests (appendix two, line 2035)
(263) [Julian] only competed in the long race because of an injury to his shoulder (appendix two, line 2155)

The verb *climb* had eight patterns which was the highest number of patterns of all the verbs, suggesting that *climb* was most polysemous (see Table 5-22). The first pattern was still dominant by a fair way (73%).

Table 5-22: Intransitive patterns of the verb 'climb'

Pattern Number	Pattern	Implicature	Frequency in data
1	[[animal |human | vehicle]] V (*adv(direction)*)	[[animal | human | vehicle]] moves in a particular manner to result in a new location [L,C,OED] E.g. *I climbed into bed* (appendix two, line 2280)	74%
2	[[abstract_entity]] V ((FROM) [[numerical_value_1]]) (TO/TOWARD/ABOVE [[numerical_value_2]])	[[abstract_entity]] increases in quanity or level [C] E.g. *PDC's stock has climbed 58 percent to $52.55 a share* (appendix two, line 2386)	13%
3	[[natural_landscape_feature_1 | route | structure]] V *direction / distance /* [[natural_landscape_feature_2]]	[[natural_landscape_feature_1 | route | structure]] has a line of course in a particular location / direction [L] E.g. *The Twin Brook Trail then climbs to Galehead Hut* (appendix two, line 2276)	4%

Pattern Number	Pattern	Implicature	Frequency in data
4	[[bird | cloud | planet]] V *location*	[[bird | cloud | planet]] gradually moves in the air to a higher location [OED] E.g. *The giant planet climbs higher in the eastern sky before midnight* (appendix two, line 2413)	3%
5	[[human = pilot | plane]] V (*direction*)	[[human = pilot]] operates [[plane]] so that it moves higher through the air E.g. *The American Airlines 767 was still climbing to cruising altitude* (appendix two, line 2321)	2%
6	[[human]] V TO {their feet}	[[human]] moves to standing position [O] E.g. *I climbed to my feet with the speed of a slug* (appendix two, line 2427)	1.5%
7	[[plant]] V *direction*	[[plant]] grows / creeps up by the aid of tendrils or by twining [OED] E.g. *Bougainvillea climbed around stucco columns* (appendix two, line 2357)	1.5%
8	[[Sound]] V	[[Sound]] increases in volume [O] E.g. *The deep male voices climbed* (appendix two, line 2271)	1%

Every instance of pattern 3 was a state, pattern 6 an accomplishment, and patterns 4 and 8 an activity. Every other pattern (1,2,5 and 7) varied in the situation type (see Figure 5-17).
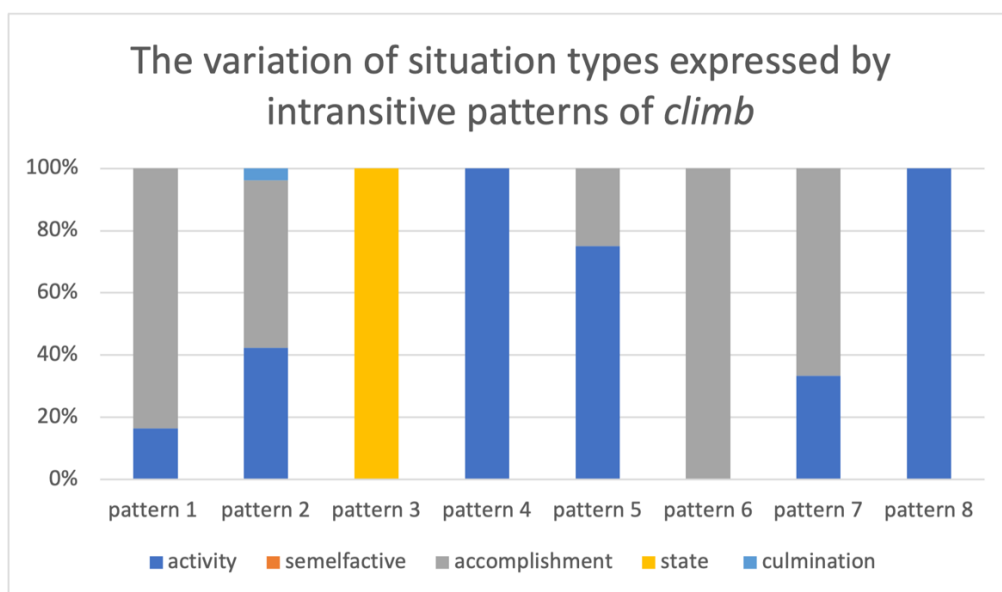
Figure 5-17: The variation of situation types across 203 intransitive instances of climb

In pattern 1, *[[animal / human / vehicle]] V adv(direction))*, 83% of instances were accomplishments and 17% activities. This pattern was split into 19 micro-patterns, which are displayed in Table 5-23. Micro-patterns 1-3 solely expressed activity, 4-15 accomplishments, and 16-19 a mixture of both.

Table 5-23: A table displaying the lexical aspect of each micro-pattern in Pattern 1 of 'climb'

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
1. human V ACROSS string	4. human V ABOARD	16. human V
2. human V BACK [metaphor]	5. human V ABOVE numerical_value [metaphor]	17. human V *adverbial*
3. human V BEHIND physical_object	6. animal/human V (P-item) ATOP/ ON/ ONTO/ ON TOP OF something	18. human V (P-item) FROM (in)animate_participant
	7. human V DOWN ((in)animate_participant)	19. animal / human V OVER (in)animate_participant
	8. human V IN ((in)animate_participant) / INTO (in)animate_participant	
	9. human V OFF (OF) ((in)animate_participant)	

Patterns in which every instance was an activity	Patterns in which every instance was an accomplishment	Patterns in which instances were either an activity or accomplishment
	10. human V (P-item) OUT (OF) ((in)animate_participant)	
	11. human V THROUGH (in)animate_participant	
	12. human V (P-item) TO ((in)animate_participant)	
	13. human V UNDER furniture / building_part	
	14. animal V INSIDE	
	15. human V UP ((in)animate_participant)	

Four micro-patterns were identified that construed both activities and accomplishments (see patterns 16-19 in Table 5-23). The first micro-pattern (16) was *human V*, with eight instances of activities (89%) and one accomplishment (11%). This accomplishment was influenced by n adverbial that had a telicizing effect (see example (264)). Note that the instance in example (264) was included in micro-pattern 16, not 17, because removing the adjunct would not affect the meaning of the instance.

> (264) Loaded like a Sherpa, he climbs until he reaches a high meadow (appendix two, line 2394)

The second micro-pattern (17), *human V adverbial*, construed 10 instances of activities (91%), and one accomplishment (9%). Examples are shown in (265) and (266) respectively. The one instance of accomplishment was also influenced by the telicizing effect of the adverbial *about 1,000 feet…* in example (266).

> (265) They are now almost climbing in slow motion (appendix two, line 2356)
> (266) I, accompanied by a guide named Stan Rock, would climb about 1,000 feet above the ranch near the head of the canyon (appendix two, line 2261)

The third micro-pattern with multiple situation types was *human V (P-item) from (in)animate_participant* (18, Table 5-23), with three instances of accomplishment (75%) and one activity (25%). Examples are displayed in (267) and (268) respectively.

> (267) He climbed from the ditch (appendix two, line 2290)
> (268) Only a Mercedes or two… climbs up from Napeague (appendix two, line 2361)

Differences in lexical aspect seemed to depend on the nominal groups in prepositional phrases. The semantic types *natural_landscape_feature* and *structure* indicated telicity, such as *the ditch* in example (267), whereas the semantic type *location* tended to occur in atelic situations, such as *Napeague* in example (268). Though, this difference in telicity might have been influenced by the verbal or prepositional semantics as opposed to the nominal group semantics; the motion of *climbs* in example (268) construes the direction that the vehicle, which might also be influenced from the prepositions *up from*. For example, Levin (2008, p.11) addresses the directed motion use of *climb*, suggesting it "has acquired a use that indicates motion in an upward direction, while losing the manner component" (ibid).

The final micro-pattern (19), which had both activities (12.5%) and accomplishments (87.5%), was *animal/human V over (in)animate_participant*. The telicity was influenced by the plural noun phrase that followed the preposition *over* (see discussion of examples (243) and (244) above).

Pattern 2, *[[abstract_entity]] V [[(numerical_value / from numerical_value)]] [[(to/toward/above numerical_value)]]*, had 26 instances: 14 (53.85%) accomplishment, 11 (42.3%) activity and one (3.85%) culmination. In the analysis, four micro-patterns were identified. The first two micro-patterns were *abstract_entity V* and *abstract_entity V toward numerical_value*, where every instance expressed an activity. Every instance of micro-pattern 3 (*abstract_entity V above numerical_value*) and 4 (*abstract_entity V numerical_value*) were accomplishments. The final micro-pattern, *abstract_entity V (numerical_value / from numerical_value) to numerical_value*, had 15 instances, 14 of which were accomplishments and one culmination. Examples can be seen in (269) and (270) respectively.

> (269) approval ratings climbed to 67 percent (appendix two, line 2448)
> (270) Hoch climbed to fourth on the PGR Tour money list (appendix two, line 2289)

In example (269), the prepositional phrase *to 67 percent* indicates the inherent endpoint of the accomplishment. In example (270), *Hoch* is an instance of metonymy for his position on the list (as Hoch is not physically climbing anywhere), and therefore the punctual change that results from the *climbing* indicates a culmination.

Pattern 5 (*[[human = pilot / plane]] V (direction)*) had four instances, one of which construed an activity-accomplishment (25%; acknowledged simply as accomplishment in this chapter), and the remaining three activities (75%). This pattern was split into three micro-patterns:

human = pilot V (adverbial), human = pilot V up, and *plane V to location.* This final pattern, *plane V to location*, was the one instance to express an activity-accomplishment (see example (271)). The accomplishment was indicated from the prepositional phrase *to cruising altitude*, and the convergence with activity was influenced from the imperfective progressive grammatical aspect.

> (271) The American Airlines 767 was still climbing to cruising altitude (appendix two, line 2321)

Pattern 7, *plant V direction*, had three instances: two accomplishments (66.7%) and one activity (33.3%). The difference in lexical aspect was dependent on the plants growing to a certain point or not, i.e. whether they were telic events (compare examples (272) and (273) with (274)).

> (272) But others, such as "little Gem", slowly climbed to a petite 20 feet (appendix two, line 2333)
> (273) When the vines can climb no farther, they undergo a change (appendix two, line 2454)
> (274) Bougainvillea climbed around stucco columns (appendix two, line 2357)

The prepositional phrase *to a petite 20 feet* in (272), and the adverbial *no farther* in (273) construed telicity and therefore an accomplishment. Conversely, the example in (274) is atelic, shown by the prepositional phrase *around stucco columns*, as there is no clear inherent end to climbing around columns.

5.5.3   Summarising situation type and pattern correlation

So far in section 5.5, two categories of verbs have been outlined according to the situation types that occur in the intransitive pattern instances of 10 verbs. In Category A, every instance of a given pattern had a one-to-one correlation with one specific situation type. For example, with the verb *frown*, every instance of *[[human]] frowns* was an activity, whilst every instance of *[[human]] frowns on/upon [[(in)animate_participant]]* was a state, showing every pattern to be homogenous in terms of situation types. These results are summarised in Table 5-24.

Table 5-24: A summary of Category A results

Category A		
Verbs	**Pattern number of verb patterns**	**Situation type of pattern**
Converse	Pattern 1	activity
Frown	Pattern 1	activity
	Pattern 2	activity
	Pattern 3	state
Meditate	Pattern 1	activity
	Pattern 2	activity
	Pattern 3	state
Resign	Pattern 1	activity
	Pattern 2	activity
Sneeze	Pattern 1	semelfactive
	Pattern 2	semelfactive
Stare	Pattern 1	activity
	Pattern 2	activity

Category B had greater variation in situation type; at least one pattern of each verb had instances of more than one situation type and therefore not every pattern was homogenous in terms of lexical aspect. For example, the first intransitive pattern of *jog* had instances of both activity and accomplishment situation types. The most typical difference was in the telicity of the event, which was the determinant of an activity or accomplishment (Declerck et al. 2006, p.70). These results are summarised in Table 5-25.

Table 5-25: A summary of Category B results

Category B		
Verbs	**Pattern number of verb patterns**	**Situation type of pattern**
Climb	Pattern 1	activity, accomplishment, state
	Pattern 2	activity, accomplishment, culmination
	Pattern 3	state
	Pattern 4	activity
	Pattern 5	activity, accomplishment
	Pattern 6	accomplishment
	Pattern 7	activity, accomplishment
	Pattern 8	activity

Verbs	Pattern number of verb patterns	Situation type of pattern
Compete	Pattern 1	activity, accomplishment
	Pattern 2	state
Jog	Pattern 1	activity, accomplishment
	Pattern 2	state
Walk	Pattern 1	activity, accomplishment, culmination, state
	Pattern 2	activity
	Pattern 3	activity
	Pattern 4	culmination
	Pattern 5	culmination
	Pattern 6	activity
	Pattern 7	culmination

Predominant influences on the variation in situation type included the prepositional head of the prepositional complement, the noun phrase in the prepositional complement, adverbials or lexico-grammatical elements in the cotext. The preposition attachment had a significant effect, which was made clearer in the breakdown of micro-patterns, such as differentiating between *to* and *towards* in the pattern *[[human]] jogs direction* (see Table 5-17). Plural noun phrases indicated atelic events (Van Rompaey 2013, p.204), as well as the semantics of certain nominals – this was shown in examples (258) and (259), where walking around a location had no inherent endpoint compared to the telic situation of walking around an object. Examples of adverbials and context affecting the lexical aspect were also displayed, as in example (264) and (266) respectively, which both created accomplishments. The following section turns to intransitive patterns as a whole, combined across all verbs.

5.6 Concluding on the relationship between intransitive patterns and lexical aspect

Overall, we have seen a strong tendency for pure intransitives to have an 'activity' situation type (61% across the whole dataset). Multiple intransitive patterns prototypically construed activities, such as *[[animate participant]] V, [[animate participant]] V on [[(in)animate participant]]* and *[[animate participant]] V for [[inanimate participant]]*, supporting the idea that activity contributes to the meaning of intransitives. Several influences were revealed that played a key role in the aspectual variation of intransitive patterns, including verbal semantics, prepositional complements, and nominal groups within these prepositional phrases. Whilst these influences are acknowledged in varying literature (Smith 1991; Rosen 1999; Declerck et

al. 2006) and therefore were unsurprising, this Intransitives study has provided an alternative approach by empirically investigating situation types from a perspective of the influence on the situation types of patterns.

Focussing on the 'bare' intransitive pattern, which is perhaps seen as the 'truest' intransitive pattern, the pattern *[[(in)animate participant]] V* was by far the most frequent of the dataset (47.5%), and most commonly construed an activity situation type (62%). As we saw in section 5.2, there are many claims in the literature that associate unergatives verbs, which predominantly occur in the bare intransitive pattern, with atelicity (Tenny 1987; Dowty 1991; van Gelderen 2018, p.10) and activity situation type (Levin and Rappaport Hovav 1995, p.71). Thus, the high percentage of activity found in the bare intransitive in these results empirically supports those claims made above. A change in situation type of the bare intransitive was mostly owing to a change in the verb; *resign* and *sneeze* were always culminations and semelfactives respectively, showing that the semantics of the verb alone was determining the lexical aspect. As shown in section 5.2, Levin and Hovav (1995, p.71) suggest that unaccusatives are generally culminations (achievements in their terms), but also recognise exceptions in which unaccusatives can be atelic. This present study has provided an alternative perspective by showing that there are exceptions to activity (atelic) unergatives, as culminations can also occur as unergatives, such as the pattern *[[(in)animate participant]] resigns.*

We might consider a basic meaning of the bare intransitive as activity, which extends in meaning depending on other lexico-grammatical elements. As prepositional complements are added to the bare intransitive, variation in the situation types also occurs (see sections 5.4.1 and 5.4.2), suggesting that the variation in lexical aspect is influenced by post-verbal elements. Looking directly at the fixed pattern *[[(in)animate participant]] V* without any influence from context reveals a potential 'default' activity meaning, which is then tangible depending on other influences. In other words, the base pattern *[[(in)animate participant]] V* can be described as fundamentally activity, and alternations of prepositional complements or semantic contributions from the lexical verb can lead to a change in the situation type. As Rappaport Hovav and Levin (1998b, p.255) show, the basic classification of *walk* is an activity and its derived classification is an accomplishment (e.g. *Sandy walked* vs *Sandy walked to the store*). The bare intransitive pattern can be thought of in the same way – the basic meaning is an activity, or at the very least dynamic and durative, but it also has an extended meaning of other

situations such as accomplishment (usually from prepositional attachment) and culmination or semelfactive (usually dependent on verbal semantics). From a Construction Grammar perspective, there is not necessarily a form-meaning pairing between the bare intransitive and situation type, though these results have pointed to an inherent association between intransitive structure and activity semantics with an animate subject (we return to this discussion in Chapter 6).

A significant finding from this study is the influence of (in)animacy, not only in affecting the semantics of the pattern of the clause, but also the situation type. Firstly, the overall high percentage of animate subjects (98%) suggests an inherent animacy of pure intransitives in this dataset. With just one participant in the pattern, the dynamicity comes from an internal force of the animate subject, providing empirical validity for the claims that pure intransitive clauses have just one energy source (Davidse 1999, p.108) and are not externally, but internally caused (Smith 1978a, p.107; Levin and Rappaport Hovav 1995, p.91; Davidse 2011, p.23). The finding here that pure intransitives have an animate internal energy source contrasts with the external causation of ergative constructions, which Davidse (1999, p.108) describes as having "a second potential energy source".

Regarding the bare intransitive, we saw that there were no states with an animate subject (in the pattern *[[animate participant]] V*), emphasising the internal animate energy source as a fundamental feature of the intransitive construction. The inanimate subject bare intransitive (*[[inanimate participant]] V*) occurred as states and activities but not accomplishments, culminations and semelfactives, though instances of this pattern were at a low frequency (18 instances) and therefore it was difficult to draw substantial conclusions. This lack of inanimate accomplishments, culminations and semelfactives in the bare intransitive did however point to an interesting area of future exploration, if more data was gathered on inanimate first participants to compare to the animate instances.

Animacy was a key feature in differentiating between the situation types of the patterns *[[animate participant]] V with [[(in)animate participant]]* and *[[inanimate participant]] V with [[(in)animate participant]]* (see section 5.4.2), as a change in the animacy of the subject was consistent with a change in situation type (see Table 5-5). The subject animacy also changed the meaning of the verb in these two patterns, which are shown in the different pattern meanings in Table 5-20. As established in section 5.4.2, the effect of intransitive subject

animacy on the situation type has not been examined in detail in existing literature, though these results have shown its significance.

To conclude, lexical aspect has contributed to our understanding of, and definition of, the inherent meaning of the intransitive construction. Durativity and dynamicity have been revealed as intransitive features and the activity situation type was the most frequent across the dataset. The bare intransitive pattern was found to have a basic meaning of activity, or at the very least dynamicity and durativity, but also an extended meaning of other situations such as accomplishment, culmination or semelfactive. Having identified the semantics of the bare intransitive pattern, we can consider this as a construction with a form-meaning correspondence.

While there seems to be evidence for an intransitive construction, with a bare intransitive pattern and an activity construal, there was nevertheless some variation. As highlighted in Table 5-3, not all patterns had a one-to-one relationship with a specific situation type. The main influences of variation in situation types included: verbal semantics; participant animacy; and elements in the post-verbal part of the pattern, such as prepositional complements, nominal groups in prepositional phrases, adverbials, and cotext. The influence of subject animacy on the aspectual meaning of patterns in particular presents an interesting perspective, as it is not commonly considered in lexical aspect classification (to the best of my knowledge).

Several areas of future research have been pointed out in this chapter. For example, one follow-up investigation of this study should involve an in-depth review of the homogenous patterns, such as those prepositional complements headed by *with*. Data could be extracted using the Corpus Query Language search in Sketch Engine and analysed in the same way as the methodology of this chapter. A comparison could then be made between animate and inanimate first participants, to see if the difference in lexical aspect still holds. Another future consideration that has not yet been considered would be to compare these patterns with the lexical aspect of ergative constructions, which might help to shed light on the intransitive meaning.

This chapter has concluded the Intransitives study of this thesis. Chapter 6, the concluding chapter to this thesis, recaps the outcomes of the three studies in this thesis and considers the benefits and contributions of this trinocular perspective.

6. Conclusion: The nature of pure intransitives and intransitive verbal categories

This thesis has explored the classification of pure intransitives by addressing their grammatical patterning combined with their semantic descriptions. As we saw in Chapters 1 and 2, whilst pure intransitive verbs have been classified in several ways, there are discrepancies in classifying intransitive experiences, especially within Systemic Functional Linguistics (SFL). Additionally, the meaning of the intransitive construction more generally has rarely been addressed. Thus, to address these challenging areas of pure intransitives, the overall aim of this dissertation has been to explore the classifications of pure intransitive clauses. To achieve this aim, three sub-aims were considered:

1. To empirically evaluate the extent to which intransitive behavioural verbs exhibit sufficiently similar semantic and lexico-grammatical features which justify the Behavioural categorization.
2. To examine whether Behaviours can be empirically differentiated from Intransitive Actions (another type of 'pure' intransitive category).
3. To determine empirically what lexico-grammatical properties and semantic features can be associated to the 'pure' intransitive construction.

This thesis has presented a multi-perspective investigation of three studies, namely the Behaviours (see Chapter 3), Intransitive Actions (IA; see Chapter 4) and Intransitives study (see Chapter 5), which each address the sub-aims consecutively. Across these three studies, we have explored the lexico-grammatical classification of intransitive verb categories, the polysemous nature of intransitive verbs, and the inherent semantics of intransitive patterning.

This final chapter recapitulates and brings together the main outcomes of each individual study, to 'connect the dots' of this multidimensional account of pure intransitives. Section 6.1 considers how each of the sub-aims have been achieved and outlines each studies' contributions to intransitive classification research. Section 6.2 discusses the general nature of intransitivity, tying together what this thesis has addressed in each chapter. Finally, section 6.3 considers the limitations of this research and section 6.4 provides some suggestions for future research.

6.1 Considering the classifications of pure intransitives

This section considers the classification of pure intransitive clauses and is structured as follows: Section 6.1.1 discusses our understanding of the Behaviours category; Section 6.1.2 explores the lexico-grammatical differences between Behaviours and other pure intransitives (Intransitive Actions specifically); and section 6.1.3 considers what we have learnt about the semantic and syntactic classification of the pure intransitive construction.

6.1.1 Understanding of Behaviours

The nature of Behaviours as a verbal category was the focus in Chapter 3, where Behaviours were defined as "outer manifestations of inner workings, the acting out of consciousness and psychological states" (Halliday and Matthiessen 2014, p.215). The 15 verbs in this category are typically intransitive with an animate subject. As discussed in Chapter 2, their lexico-grammatical features are not sufficiently defined to form a distinct category since they share many features with other categories of verbs. To better understand this rather loosely described set of verbs, the Behaviours study in Chapter 3 aimed to empirically evaluate the extent to which intransitive Behavioural verbs exhibit sufficiently similar semantic and lexico-grammatical features which justify the Behavioural categorization. Two sub-aims were considered to achieve this aim: to use empirical evidence to identify a reliable set of lexico-grammatical descriptors of Behavioural verbs; and to determine the extent to which Behaviours can be empirically established as a category.

The outcome of this study identified five lexico-grammatical features of Behaviours: intransitive grammatical structure; lack of *that*-complement attachment; animate subject; perfective grammatical aspect in the present; and activity or semelfactive lexical aspect. While most of these features were assumed in the literature, this work is the first to establish this empirically. The frequency of perfective grammatical aspect was a surprising finding since many scholars did not predict this would be the case (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Eggins 2004, p.234). For example, behavioural processes in SFL were predicted to occur in the *-ing* form in the unmarked tense (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Eggins 2004, p.234), as were Behavioural verb types, such as *meditating,* in Cognitive Grammar (Langacker 2008, p.148). Overall, the results established the validity of a Behaviours category due to the relative consistency of each verb's lexico-grammatical features in the study.

Through the Corpus Pattern Analysis (Hanks 2004a), I was able to provide a detailed account of the polysemy of the different verbs. The greater the number of patterns for a given verb, the more flexible the verb is, which seems to create greater opportunities for a divergence between the syntax and the semantics. Consequently, it became difficult to determine whether an instance of the verb could still reasonably be considered a Behaviour, rather than shifting to some other category. If this study demonstrated that verbs of Behaviour are strongly associated with the features of intransitivity and animacy (among other things), we cannot be certain that it is the only category of verb associated to the intransitive structure. For example, as explored in Chapter 4, these verbs share considerable features with action verbs that are intransitive.

6.1.2   Behaviours compared to Intransitive Actions

While distinguishing between transitive and intransitive instances is relatively straightforward, it is not so straightforward to differentiate instances within the intransitive class of verbs. Whereas Behaviours have been established as exclusively intransitive, this is not the case for verbs which can be described semantically as action-oriented. The Intransitive Actions therefore need to be considered in contrast to the Behaviours we examined in Chapter 3. Thus, Chapter 4 explored the (dis)similarities between the lexico-grammatical features of Behaviours and Intransitive Actions. As was discussed earlier in the thesis, we find overlaps in the literature concerning the boundary between these two, for example whether verbs such as *swimming, singing, dancing* are best classified as Intransitive Actions or Behaviours. Within the framework of SFL, behaviours and actions belong theoretically to two separate categories, but this position has never been challenged empirically. The IA study presented in Chapter 4 aimed to empirically attest the theoretical claims about the lexico-grammatical features of Behaviours and Intransitive Actions, and to determine the extent to which Behaviours and Intransitive Actions can be differentiated.

The results of this IA study revealed four lexico-grammatical features of both Behaviours and Intransitive Actions: intransitive grammatical structure; absence of a *that*-complement; animate subject; and perfective grammatical aspect in the present. Similar to the previous study, most of the features found here were predicted in the literature, though this IA study contributed empirical validity by drawing conclusions from authentic data. The high frequency of perfective grammatical aspect in Intransitive Actions was not anticipated, as several

researchers, particularly within SFL, predicted that Intransitive Actions in the present tense occur with imperfective progressive aspect (Martin and Matthiessen 1992, p.363; Halliday 1994, p.139; Eggins 2004, p.234). Cramer's V and Phi coefficient tests revealed weak effect sizes for comparisons of animacy, intransitivity, and grammatical aspect, with statistically significant results ($p < 0.001$) in Chi-squared and Fisher exact tests, meaning that we can confidently conclude that there were no substantial differences of these features between Behaviours and Intransitive Actions. However, a comparison of situation type between the two verb categories revealed a strong effect size (0.673) and thus a large difference. This difference was highly statistically significant ($P < 0.001$), and therefore lexical aspect was confidently considered as a distinguishing feature between Behaviours and Intransitive Actions.

Considering the five features collectively, the best determiner of Behaviours and Intransitive Actions involved a combination of lexical aspect and animacy, with lexical aspect as the strongest predictor. An activity with an animate subject was most likely a Behaviour, whilst an activity with inanimate subject was always an Intransitive Action. I proposed that all animate pure intransitives should be grouped together as Behaviours, and any inanimate pure intransitives as Intransitive Actions. In terms of SFL, this proposal would converge animate intransitive material processes, such as *running, swimming, singing*, with behaviourals and solve the discrepancies in classification of these types.

6.1.3   Towards an understanding of the intransitive construction

Whilst the semantics of transitive, ditransitive and ergative constructions are well established, the pure intransitive construction has more often been overlooked. One description comes from Smith (1978a, p.107), who describes the experience as an "independent activity". Scholars have offered semantic descriptions of participant roles, for example Davidse (1999, p.108) describes the process as from a single energy source, and elsewhere it is noted that the experience is not externally, but internally caused (Smith 1978a, p.107; Levin and Rappaport Hovav 1995, p.91; Davidse 2011, p.23). Links are also established between pure intransitive verbs and atelicity or activity situation type, though exceptions are acknowledged. However, these semantic attributes of pure intransitives have not yet been established empirically, or in relation to the whole pure intransitive pattern. Chapter 5 therefore explored the semantics of 56 intransitive patterns, with the aim of determining empirically what lexico-grammatical properties and semantic features can be associated to the 'pure' intransitive construction. This

semantic description was established using lexical aspect, and a focus on three sub-aims: to empirically evaluate the extent to which can lexical aspect contribute to the inherent meaning of an intransitive construction; to examine the degree of variation in lexical aspect within and between intransitive constructions; and to determine the main influences of the variation in lexical aspect, if any.

The major outcome of this study was an inherent activity meaning of pure intransitives, with extended meanings influenced by verbal semantics and clausal elements such as prepositional complements (see below). Dynamicity is a key feature of intransitives, meaning that they tend not to be states, and durativity is also significant. The participant role of pure intransitives is the sole, internal force of the process, which is typically animate. We can view the bare intransitive (*[[(in)animate participant]] V*) as the 'truest' intransitive considering its dominance in the dataset (47.5%), which has a basic activity meaning with an animate internal energy source.

Several lexico-grammatical elements influenced a semantic shift in the reading of pure intransitives. Whilst pure intransitives are fundamentally atelic with an activity reading, certain lexico-grammatical elements have a telicizing effect and may coerce a given instance into a telic reading. For example, when the bare intransitive attached a prepositional complement headed with *to*, this pattern always had an accomplishment reading. Additionally, verbal semantics influenced the temporal meaning of the bare intransitive, such as the inherent meaning of *sneeze* giving a semelfactive reading. Finally, the animacy of the subject influenced a change in meaning of the same pattern, when the bare intransitive attached a prepositional complement headed with *with*, animate subjects occurred in activities whilst inanimate subjects occurred in states. Although this pattern is accounted for in previous works (Levin 1993, pp.62–63; Francis et al. 1996, p.455), they do not take subject animacy into consideration. The influence that subject animacy had on pattern meaning in the results outlined above highlights the developments that could be made in pattern semantics research when considering animacy. The following section continues the discussion of intransitives, capturing what this thesis has revealed about the nature of the intransitive.

6.2 The nature of the intransitive

The final discussion point is to ask what the nature of the intransitive construction is. This research has speculated whether there is an inherent intransitive meaning (see Chapter 5), like there are for transitive and ditransitive constructions. Though the results of the three studies presented in this thesis have not revealed a resoundingly consistent intransitive meaning, they have exposed several key attributes of intransitives.

The Behaviours and IA studies showed that intransitives typically have animate first participants, which confirms claims made in the literature (Smith 1978a fn 12 p.109; van Gelderen 2018, p.28). For example, out of 424 intransitive instances across 15 Behaviours, 98.6% have animate intransitive subjects (see Chapter 3). Out of 2405 intransitive instances of five Behaviours and five intransitive actions, 97.2% have animate intransitive subjects (see Chapter 4), indicating an inherent animacy of the single argument in pure intransitives.

The implementation of Corpus Pattern Analysis (CPA) in the Intransitives study (Chapter 5) showed that the bare intransitive is the most typical intransitive patterning – in a dataset of 2405 intransitive instances, nearly half are bare intransitives (47.5%). The remaining patterns are variable in their complement (mostly prepositional) attachment. The most frequent prepositional attachment is with the prepositional head *at* (9%), followed by *with* (7%), then *on* (5%), and *to*, *in* and *into* (each 3%). As discussed in section 5.6, the bare pattern *[[(in)animate participant]] V* can fundamentally be described as an activity, and alternations of prepositional complements or semantic contributions from the lexical verb can lead to a change in the situation type. Dynamicity and durativity are also key aspectual features of the bare intransitive, occurring in 97.76% and 77.38% of instances respectively. From a combination of the lexical aspect results and animate participant results, we can speculate that the definition of an intransitive is simply a dynamic process from the typically animate intransitive subject as the energy source. This definition builds on the suggestion that intransitive clauses have just one energy source (Davidse 1999, p.108) that are "internally caused" (Levin and Rappaport Hovav 1995, p.91). Similarly, the definition upholds Smith's (1978a, p.107) claim that these intransitives represent an activity from a single, internal force.

We can consider whether there is a form-meaning pairing with the bare intransitive construction (*[[[(in)animate participant]] V*) in terms of Construction Grammar. As shown in

section 2.1.3, Construction Grammar concerns the idea that we form a network of language from a collection of constructions that is stored in our knowledge, in which a construction is defined as a "form-meaning correspondence" (Goldberg 1995, p.6). Whilst there was not a one-to-one correlation with a particular situation type and the bare intransitive, there was a clear inherent meaning of dynamicity and a base meaning of atelicity and activity situation type. The subject is the sole energy source and the event is internally caused. Bare intransitives with inanimate subjects were infrequent enough to be considered exploitations (1.6%) and therefore we can also define the internal force as typically animate. Although there are "various different approaches to the representation of constructions" in Construction Grammar (Hoffmann and Trousdale 2013a, p.2), a semantic construction is typically outlined with 'X' as the subject and the meaning in small uppercase (see the constructions in section 2.1.3), and so from the results outlined here I propose that the semantic construction of the bare intransitive is 'X DYNAMIC PROCESS'. Section 5.4.2 revealed the intransitive patterns in which there was a 'form-meaning'-like pairing with a particular pattern and situation type. Fourteen patterns were paired with activity, 14 with accomplishment, four with state and three with culmination. These all included patterns with a particular prepositional attachment, for example every instance of *[[animate participant]] V at [[(in)animate participant]]* was an activity. Whilst this does not show a fixed constructional meaning in terms of Construction Grammar, parallels can be drawn with the one-to-one form-meaning correlations. In this thesis, CPA (Hanks 2004) was the predominant methodology and so the patterns are presented differently to what they would be in Construction Grammar, such as inclusion of participant animacy. Participant animacy was shown to make a statistically significant difference on pattern meaning, such as with the patterns *[[animate participant]] V with [[(in)animate participant]]* and *[[inanimate participant]] V with [[(in)animate participant]]* (see section 5.4.2), which emphasises the potential of the lexico-grammar in determining the nature of the intransitive. Whilst the discussion in Chapter 5 showed one-to-one correlations of patterns and situation types, it still emphasised the need for further research as most of the patterns were of relative low frequency (<1% of the data).

As an alternative perspective to the bare intransitive construction, we will now consider intransitive verb types. The results of the Behaviours study (Chapter 3) suggested that certain intransitive verb types lend themselves to be more 'transitive-like' depending on their most typical patterning. The physiological verbs (*laugh, frown, cry, hiccup, shiver, sneeze*) most frequently occurred in the bare intransitive, whilst communicative verbs (*talk, converse,*

gossip) and psychological perception verbs (*look*, *stare*, *listen*) most frequently occurred with prepositional complements. These verbs that typically occur with prepositional complements are likely more adaptable to 'transitive-like' situations. For example, transitive constructions are defined as a process going across from one participant to another (Hopper and Thompson 1980, p.253; Huddleston 1984, p.190) (see Chapter 1 and section 5.1) and communicative Behaviours represent a transfer of communication from one participant to another. By contrast, the physiological Behaviours do not frequently involve a receptive participant. The transitive-like nature of certain intransitive verbs is supported by Dixon and Aikhenvald (2000b, p.19), who claim that the psychological perception Behaviour *look (at)* falls "into the middle section of the transitivity scale" that is outlined by Hopper and Thompson (1980). However, they also include *laugh (at)* as an example, though this thesis found that *laugh* most frequently occurred as a bare intransitive. Dixon and Aikhenvald (2000b, p.20) go on to note that these verbs would be "prime candidates" if there were to be some kind of "extended intransitive class" and cross-linguistically the verbs are sometimes transitive and sometimes intransitive, depending on the language. Thus, there is an evident cline in the transitive nature of intransitive verb types.

An etymological investigation into the transitivity of intransitive verb types could develop our understanding of the differences between the typical constructions of each semantic group and show any influences from changes in time. In one etymological investigation, van Gelderen (2018, p.56) highlighted the loss of intransitive verbs such as *ablican* (shine) and certain shifts into more transitive or causative uses such as *dropian* (drop) (see section 5.1), as well as transitions towards more fixed prepositional complement attachments as opposed to the bare intransitive. van Gelderen regards the fixed prepositional complement attachments as transitive, for example "prepositional verbs" such as "compete, concur [and] disagree" are outlined as transitive uses (ibid p.57). Whilst these prepositional verbs are regarded as intransitive according to the intransitive definition in this thesis, a historical corpus analysis could show the change in grammatical patterning of Behaviours to see if they have shifted in transitivity to become more mental, verbal or action-like.

As we saw in the IA study, there was no clear trend concerning the typical patterning of Behavioural and Intransitive Action verbs; three Behaviours (*frown*, *meditate*, *sneeze*) and one Intransitive Action (*resign*) most typically occurred in a bare intransitive pattern, whilst two Behaviours (*converse*, *stare*) and four Intransitive Actions (*jog*, *walk*, *compete*, *climb*) most commonly occurred in a pattern with a prepositional complement. However, taking into

account every instance of the category regardless of the verb, Intransitive Action verbs most commonly occurred with a complement of one kind or another (57.6%) whilst Behavioural verbs were most typical in the bare intransitive (56.6%), suggesting that Intransitive Actions are more transitive-like and Behaviours are fundamentally 'truer' intransitives. Intransitive action verbs were also used transitively (6.9%) more often than Behaviours (0.7%). As suggested above with Behaviours, an etymological investigation might reveal transitions in preposition and transitivity uses.

In summary, section 6.2 has discussed the activity nature of the intransitive construction as well as the intransitivity classifications of intransitive verbs. The following section considers some limitations of this research, followed by avenues of future research in section 6.4.

6.3 Limitations

Whilst this research has contributed insights into the classification of pure intransitives, the multi-perspective approach meant that there were some restrictions to each study. This section discusses these restrictions and the nature of the three-study approach in more detail.

In the first two studies, the data collection process involved a compromise between more verbs and fewer instances (breadth) and fewer verbs and more instances (depth). The dataset in the Behaviours study (Chapter 3) was composed of 450 instances of Behaviours, including five semantic Behavioural groups (90 instances per group) and 15 verbs (30 instances per verb). While the number of instances of each individual verb was kept low, the high number of overall instances gave insights into the lexico-grammatical features of this group. On the other hand, the dataset in the IA study (Chapter 4) consisted of only five Behavioural verbs and five Intransitive Action verbs, but 250 instances of each verb were analysed. The decision to analyse 250 instances of each verb was made following the recommendation from Corpus Pattern Analysis (cf Hanks 2004) that 250 instances provides a representative sample of verb usage (see section 4.3.1). To support the representativeness of the data, in this IA study, the most prototypically Behavioural verbs were used from the Behaviours study. Further, it would have been ideal to implement a pilot study of Intransitive Actions to obtain the most representative verb types, however this would have been too time consuming and was not in the scope of this research. Therefore, literature and databases were used to obtain Intransitive Action verbs instead. Whilst the data samples in the Behaviours and IA studies had to be limited in order to

carry out extensive manual analysis within time constraints, given more time and scope it would be interesting to extend the variety of verbs and investigate alternative ones.

The dataset in the Intransitives study consisted of 2405 pure intransitive patterns. This data was taken from the dataset of 10 verbs in the IA study and therefore minimal additional analysis was needed (see section 5.3). Making use of the IA data in the Intransitives study enabled this third study to be carried out within the time and scope of this research. Collecting a separate set of data, such as from a corpus search of pure intransitive patterns, could have provided more breadth to the data however it would have had to be restricted in other ways such as a significantly reduced number of instances. Thus, future research could expand on this with additional pure intransitive patterns that include other verbs (we return to this idea in section 6.4). Overall, despite these restrictions, the multi-perspective design allowed us to gain a more general understanding of intransitives from several studies, rather than focussing on a specific aspect within intransitivity.

Furthermore, the cyclic nature of data collection can be seen as problematic, however in my studies (specifically the Behaviours and IA studies) this was not the case. For example, as a logical starting point to obtain relevant data, the verbs were selected according to their predicted lexico-grammatical features, which were described in the literature. It was evident that the methodological process did not set up predictive results because they not only confirmed features from the literature but showed variation. For example, the grammatical aspect results opposed theoretical assumptions (see sections 3.3.2.5 and 4.5.4), highlighting the benefit in using empirical data to review theoretical claims.

Therefore, while the three-study approach meant that each study had to be somewhat limited in nature, it allowed for a broader and more in-depth investigation into pure intransitives. The research was strengthened by the three studies as they shed light on various perspectives of intransitive classification as opposed to focussing on just one aspect. For example, expanding the Behaviours study would have provided us with a richer understanding of different Behavioural verbs, however, we would have lost insights into the nature of other pure intransitives such as Intransitive Actions. Thus, to achieve the aims of this research and develop the full picture, it was reasonable to set limits to each study. Additionally, the multi-faceted nature of this research revealed numerous ideas for future research across all three studies, which are addressed in the following section.

6.4 Future research

A number of directions for future research have been highlighted throughout this thesis, including: the volition of pure intransitives (see sections 3.1 and 4.2); the semantic properties of polysemous and less polysemous verbs (see section 3.4); a genre analysis of pure intransitives (see section 4.5.4); an etymological investigation of pure intransitive patterning (see sections 3.3.2.2 and 6.2).

In the following, we explore one avenue of future research in detail. The Intransitives study revealed empirical evidence of intransitive patterns with a one-to-one correlation with a specific situation type, however these were very infrequent (see section 5.5) and therefore more instances would be required to gain a better reflection of current language use. In particular, the results suggested that the animacy of the first participant might influence the situation type, which would be interesting scope for future investigation. For example, the pure intransitive instances that included a *with* prepositional complement revealed different situation types dependent on subject animacy, however the infrequency of inanimate subjects reduced the reliability in drawing substantial conclusions. A large sample size of the patterns from my results with a one-to-one correlation with a situation type (eg. *participant V with participant*, *participant V on participant* etc.) could be obtained from a corpus that is compatible with Sketch Engine, a corpus tool that allows the search of specific grammatical patterns (Kilgarriff et al. 2014). Each instance could be analysed to reveal the syntactic and semantic attributes of these pure intransitive patterns. Research focussing on these patterns pattern types would be particularly useful in expanding our understanding of intransitive meanings and the importance of animacy on the semantic description of a construction. It would allow us to more confidently claim whether a change in animacy results in a change in situation type, or other inherent meaning.

References

Aarts, B. 2013. *English syntax and argumentation*. 4th ed. Basingstoke: Palgrave Macmillan.

Alexiadou, A., Anagnostopoulou, E., and Everaert, M. 2004. *The Unaccusativity Puzzle: Explorations of the syntax-semantics interface*. Oxford: Oxford University Press.

Aurnague, M. 2011. How motion verbs are spatial. The spatial foundations of intransitive motion verbs in French. *Lingvisticæ Investigationes* 34(1), pp. 1–14.

Bach, E. 1986. The algebra of events. *Linguistics and Philosophy* 9, pp. 5–16.

Bache, C. 2008. *English Tense and Aspect in Halliday's Systemic Functional Grammar*. London: Equinox.

Baker, C., Fillmore, C., and Lowe, J. 1998. The Berkeley FrameNet Project. In: *COLING-ACL '98: Proceedings of the Conference*. Montreal, Canada. Available at: http://www.aclweb.org/anthology/C98-1013 [Accessed: 14 March 2019].

Baker, C. and Ruppenhofer, J. 2002. FrameNet ' s Frames vs . Levin ' s Verb classes. (August), pp. 27–38.

Baker, P. 2006. *Using Corpora in Discourse Analysis*. London: Continuum.

Banks, D. 2015. On the (non) necessity of the hybrid category behavioural process. In: Bayley, P. ed. *Hybridity in Systemic Functional Linguistics: Grammar, Text and Discursive Context*. London: Equinox, pp. 21–40.

Bartlett, T. 2014. *Analysing power in language: a practical guide*. London and New York: Routledge.

Bartley, L. 2017. *TRANSITIVITY, no stone left unturned: Introducing flexibility and granularity into the framework for the analysis of courtroom discourse*. PhD Thesis. Universidad de Granada, Granada.

Beavers, J., Levin, B., and Shiao Wei, T. 2010. The typology of motion expressions revisited. *Journal of Linguistics* 46(2), pp. 331–377.

Bloor, T. and Bloor, M. 2004. *The Functional Analysis of English*. London: Hodder Arnold.

Boas, H. 2013. Cognitive Construction Grammar. In: Trousdale, G. and Hoffmann, T. eds. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press, pp. 233–252.

Borer, H. 2005. *Structuring Sense. Volume ii: The Normal course of Events*. Oxford, UK: Oxford University Press.

Brinton, L.J. 1987. The aspectual nature of states and habits. *Folia Linguistica* 21(2–4), pp. 195–214.

Brinton, L.J. 1988. *The development of English aspectual systems: aspectualizers and post-verbal particles (Cambridge studies in linguistics Vol. 49)*. Cambridge: Cambridge University Press.

Brinton, L.J. 1998. Aspectuality and countability: a cross-categorial analogy 1. *English Language and Linguistics* 2(1), pp. 37–63.

Butler, C. 2003. *Structure and Function. A Guide to three major structural-functional theories. Part 1, Approaches to the simplex clause*. Amsterdam: John Benjamins.

Butler, C. 2013. Systemic Functional Linguistics, Cognitive Linguistics and psycholinguistics: Opportunities for dialogue. *Functions of Language* 20(2), pp. 185–218.

Campo, A.A. and Araque, I.R. 2013. Corpus Pattern Analysis in determining specialised uses of verbal lexical units. *Terminàlia* (7), pp. 26–33.

Chrispin, L. 2017. *Are experiences encoded in the grammar of the clause? An investigation into phyiological and psychological behaviour*. Cardiff University.

Comrie, B. 1976. *Aspect: an introduction to the study of verbal aspect and related problems (Cambridge textbooks in linguistics Vol. 7)*. Cambridge: Cambridge University Press.

Comrie, B. 1985. *Tense*. Cambridge: Cambridge University Press.

Crainiceanu, I. and Baciu, I. 2009. Explaining the (A)telicity Property of English Verb Phrases. *Acta Universitatis Sapientiae, Philologica* 1(2), pp. 197–211.

Croft, W. 2001. *Radical Construction Grammar*. Oxford: Oxford University Press.

Croft, W. 2007. Construction Grammar. In: Geeraerts, D. and Cuyckens, H. eds. *The Oxford handbook of cognitive linguistics*. Oxford: Oxford University Press, pp. 463–508.

Croft, W. and Cruise, D. 2012. *Cognitive linguistics*. Cambridge: Cambridge University Press.

Cruse, D. 1973. Some Thoughts on Agentivity. *Journal of Linguistics* 9(1), pp. 11–23.

Dąbrowska, A. 2016a. Unaccusative or unergative: The case of the English verb to die. *Roczniki humanistyczne* 64(11), pp. 25–39.

Dąbrowska, E. 2016b. Cognitive Linguistics' seven deadly sins. *Cognitive Linguistics* 27(4), pp. 479–491. doi: 10.1515/cog-2016-0059.

van Dam, W. and Desai, R. 2016. The Semantics of Syntax: The Grounding of Transitive and Intransitive Constructions. *Journal of Cognitive Neuroscience* 28(5), pp. 693–709.

Dang, T., Kipper, K., and Palmer, M. 1998. Investigating regular sense extensions based on intersective Levin classes. In: *36th Annual Meeting of the Association for Computational Linguistics and 17th International Conference on Computational Linguistics*. Montreal, Canada, pp. 293–299.

Davidse, K. 1999. *Categories of experiential grammar*. Nottingham: University of Nottingham.

Davidse, K. 2011. Alternations as a heuristic to verb meaning and the semantics of constructions. In: Medina, P. ed. *Morphosyntactic Alternations in English*. London: Equinox, pp. 11–37.

Davidse, K. 2017. Systemic functional linguistics and the clause: The experiential metafunction. In: Bartlett, T. and O'Grady, G. eds. *The Routledge Handbook of Systemic Functional Linguistics*. London and New York: Routledge, pp. 79–95.

Davidse, K. and Breban, T. 2019. A cognitive-functional approach to the order of adjectives in the English noun phrase. *linguistics* 57(2), pp. 327–371.

Davidse, K. and Geyskens, S. 1998. Have you walked the dog yet? The ergative causativization of intransitives. *WORD* 49(2), pp. 155–180.

Davidse, K. and Heyvaert, L. 2003. On the so-called 'middle' construction in English and Dutch. In: Granger, S. et al. eds. *Empirical Approaches to Contrastive Linguistics and Translation Studies*. Amsterdam: Rodopi, pp. 57–73.

Davidse, K. and Heyvaert, L. 2007. On the middle voice: an interpersonal analysis of the English middle. *Linguistics* 45(1), pp. 37–83.

Davidse, K. and Olivier, N. 2008. English middles with mental and verbal predicates: Towards a typology. *English Text Construction* 1(2), pp. 169–197. Available at: http://www.jbe-platform.com/content/journals/10.1075/etc.1.2.02dav.

Davidse, K. and Rymen, K. 2008. Cognate and locative complements: Their effect on (a)telicity and their semantic relation to the verb. *Lingvisticæ Investigationes* 31(2), pp. 256–272.

Davies, M. 2008-. The Corpus of Contemporary American English (COCA): 560 million words, 1990-present. Available at: https://corpus.byu.edu/coca/.

Declerck, R. 1991. *A comprehensive descriptive grammar of English*. Tokyo: Kaitakusha.

Declerck, R., Reed, S., and Capelle, B. 2006. *The Grammar of the English Verb Phrase. Volume I: The Grammar of the English Tense System*. Berlin: Mouton de Gruyter.

Depraetere, I. 1995. On The Necessity Of Distinguishing (Un)boundedness And (A)telicity. *Linguistics and Philosophy* 18, pp. 1–19.

Depraetere, I. and Reed, S. 2006. Mood and Modality in English. In: Aarts, B. and McMahon, A. eds. *The Handbook of English Linguistics*. Oxford, UK: Blackwell Publishing Ltd

Dik, S. 1997. *The theory of functional grammar: 1, The structure of the clause (Functional grammar series Vol. 9)*. 2nd ed. Berlin: Mouton de Gruyter.

Dixon, R. 1998. *Ergativity*. 2nd ed. Cambridge: Cambridge University Press.

Dixon, R. 2005. *A Semantic Approach to English Grammar*. 2nd ed. Oxford, UK: Oxford University Press. doi: 10.1075/sl.32.4.08end.

Dixon, R. and Aikhenvald, A. 2000a. *Changing Valency: Case Studies in Transitivity*. Cambridge: Cambridge University Press.

Dixon, R. and Aikhenvald, A. 2000b. Introduction. In: Dixon, R. and Aikhenvald, A. eds. *Changing Valency: Case Studies in Transitivity*. Cambridge: Cambridge University Press, pp. 1–29.

Dorr, B. and Olsen, M. 1997. *Deriving Verbal and Compositional Lexical Aspect for NLP Applications*.

Downing, A. and Locke, P. 2006. *English Grammar. A University Course*. 2nd ed. London: Routledge.

Dowty, D. 1977. Toward a Semantic Analysis of Verb Aspect and the English 'Imperfective' Progressive. *Linguistics and Philosophy* 1(1), pp. 45–77.

Dowty, D. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's Ptq*. Dordrecht, Holland; London: D. Reidel.

Dowty, D. 1986. The effects of aspectual class on the temporal structure of discourse: semantics or pragmatics? *Linguistics and Philosophy* 9, pp. 37–61.

Dowty, D. 1991. Thematic Proto-Roles and Argument Selection. *Language* 67(3), pp. 547–619.

Dowty, D. 2000. The Dual Analysis of Adjuncts / Complements in Categorial Grammar. *ZAS Papers in Linguistics* 17, pp. 53–78.

Drăgan, R. 2011. Motion Verbs and the Expression of Directed Motion in English. *Bucharest Working Papers Vol XIII* (2), pp. 73–89.

Dryer, M. 2007. Clause types. In: Shopen, T. ed. *Language Typology and Syntactic Description. Volume 1: Clause Structure*. 2nd ed. Cambridge: Cambridge University Press, pp. 224–275.

Eggins, S. 1994. *An introduction to Systemic Functional Linguistics*. London: Pinter Publishers.

Eggins, S. 2004. *An Introduction to Systemic Functional Linguistics*. 2nd ed. London: Pinter Publishers.

Fagan, S. 1988. The English Middle. *Linguistic Inquiry* 19(2), pp. 181–203.

Fawcett, R. 1980. *Cognitive Linguistics and social interaction: Towards an integrated model of a Systemic Functional Grammar and the other components of an interacting mind*. Heidelberg: Julius Groos & Exeter University.

Fawcett, R. 1987. The semantics of clause and verb for relational processes in English. In: Halliday, M. A. K. and Fawcett, R. eds. *New developments in systemic linguistics, Vol 1: Theory and description*. London: Pinter Publishers, pp. 130–183.

Fawcett, R. 2000. *A theory of syntax for systemic functional linguistics*. Amsterdam: John Benjamins.

Fawcett, R. 2009. Seven problems to beware of when analyzing processes and participant roles in texts. In: Slembrouck, S. et al. eds. *From Will to Well: Studies in Linguistics, Offered to Anne-Marie Simon-Vandenbergen*. Gent: Gent Academic press, pp. 209–224.

Fillmore, C. 1982. Towards a descriptive framework for spatial deixis. In: Jarvell, R. and Klein, W. eds. *Speech, Place and Action: Studies in Deixis and Related Topics*. London: Wiley, pp. 31–59.

Fillmore, C. 1988. The Mechanisms of "Construction Grammar". In: *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society*., pp. 35–55. Available at: http://linguistics.berkeley.edu/bls/. [Accessed: 10 March 2021].

Fillmore, C. and Baker, C. 2010. A Frames Approach to Semantic Analysis. In: Heine, B. and Narrog, H. eds. *The Oxford Handbook of Linguistic Analysis*. Oxford: Oxford University Press

Fischer, K. 2015. Conversation, Construction Grammar, and Cognition. *Language and Cognition* 7, pp. 563–588.

Fong, R. 2020. Caused-Motion Constructions in Chinese: A constructional-cognitive analysis. *Ampersand* 7, pp. 1–8.

Fontaine, L. 2013. *Analysing English Grammar: A Systemic Functional Introduction*. Cambridge: Cambridge University Press.

Fontaine, L. 2017. On prepositions and particles: a case for lexical representation in systemic functional linguistics. *WORD* 63(2), pp. 115–135.

Francis, G., Hunston, S., and Manning, E. 1996. *Collins COBUILD Grammar Patterns 1: Verbs*. London: Harper Collins Publishers.

Francis, G., Hunston, S., and Manning, E. 1998. *Grammar Patterns 2: Nouns and Adjectives*. London: Harper Collins Publishers.

Geeraerts, D. 2010. *Theories of Lexical Semantics*. Berlin: Mouton de Gruyter.

van Gelderen, E. 2018. *The Diachrony of Verb Meaning*. New York: Routledge.

van Gelderen, E. 2019. Stability and Change in Intransitive Argument Structure. *Open Linguistics* 5(1), pp. 217–232.

Gervais, M. and Wilson, D. 2005. The evolution and functions of laughter and humor: A synthetic approach. *Quarterly Review of Biology* 80, pp. 395–430.

Gerwin, J. 2013. Give it me!: pronominal ditransitives in English dialects. *English Language and Linguistics* 17(3), pp. 445–463.

Givón, T. 1993. *English grammar: a function-based introduction. Volume I.* Amsterdam: John Benjamins.

Goddard, C. 2020. Prototypes, polysemy and constructional semantics: The lexicogrammar of the English verb climb. *Meaning, Life and Culture: In conversation with Anna Wierzbicka* , pp. 13–32.

Goldberg, A. 1995. *Constructions: A Construction Grammar Approach to Argument Structure.* Chicago: The University of Chicago Press.

Goldberg, A. 1999. The Emergence of the Semantics of Argument Structure Constructions. In: MacWhinney, B. ed. *The Emergence of Language*. New Jersey: Lawrence Erlbaum Associates, pp. 197–212.

Goldberg, A. 2003. Constructions: a new theoretical approach to language. *TRENDS in Cognitive Sciences* 7(5), pp. 219–224.

Gonzálvez-García, F. and Butler, C. 2018. Situating Valency Theory in functional-cognitive space. *Review of Cognitive Linguistics* 16(2), pp. 348–398.

Granger, S. 2003. The corpus approach: a common way forward for Contrastive Linguistics and Translation Studies? In: Granger, S. et al. eds. *Corpus-based approaches to contrastive linguistics and translation studies*. Amsterdam and Atlanta: Rodopi, pp. 17–29.

Grice, P. 1968. Utterer's Meaning, Sentence-Meaning, and Word-Meaning. *Foundations of Language* 4(3), pp. 225–242.

Gries, S. 2010. Useful statistics for corpus linguistics. *A mosaic of corpus linguistics: Selected approaches* 66, pp. 269–291.

Guerssel, M., Hale, K., Laughren, M., Levin, B., and White Eagle., J. 1985. A Cross-Linguistic Study of Transitivity Alternations." Papers from the Parasession on Causatives and Agentivity. *Chicago Linguistic Society* , pp. 48–63.

Gwilliams, L. and Fontaine, L. 2015. Indeterminacy in process type classification. *Functional Linguistics* 2(8), pp. 1–19.

Halliday, M.A.K. 1985. *An Introduction to Functional Grammar*. London: Edward Arnold.

Halliday, M.A.K. 1992. Language as system and language as instance: the corpus as a theoretical construct. In: Svartvik, J. ed. *Directions in corpus linguistics: proceedings of the Nobel Symposium 82, Stockholm, 4–8 August 1991*. Berlin: Mouton de Gruyter, pp. 61–77.

Halliday, M.A.K. 1994. *An Introduction to Functional Grammar*. 2nd ed. London: Edward Arnold.

Halliday, M.A.K. 2002a. "Judge Takes No CAP In Mid-Sentence": On the Complementarity of Grammar and Lexis. In: *The First Open Sinclair Lecture.* Birmingham: The University of Birmingham, Department of English.

Halliday, M.A.K. 2002b. Language Structure and Language function. In: Webster, J. ed. *On Grammar. Collected Works of MAK Halliday, vol I.* London: Continuum

Halliday, M.A.K. and Matthiessen, C. 1999. *Construing Experience through Meaning: A Language-based Approach to Cognition.* London: Hodder Arnold.

Halliday, M.A.K. and Matthiessen, C. 2004. *An Introduction to Functional Grammar.* 3rd ed. London: Hodder Arnold.

Halliday, M.A.K. and Matthiessen, C. 2006. *Construing Experience through Meaning: A Language-based Approach to Cognition.* 5th ed. London: Hodder Arnold.

Halliday, M.A.K. and Matthiessen, C. 2014. *An Introduction to Functional Grammar.* 4th ed. London: Routledge.

Hanks, P. 2004a. Corpus Pattern Analysis. In: Williams, G. and Vessier, S. eds. *Proceedings of the 11th Euralex International Congress.* Lorient, France: UBS, pp. 87–98.

Hanks, P. 2004b. The Syntagmatics of Metaphor and Idiom. *International Journal of Lexicography* 17(3), pp.- 245–274.

Hanks, P. 2008. Lexical Patterns: From Hornby to Hunston and Beyond. In: Bernal, E. and DeCesaris, J. eds. *Proceedings of the XIII EURALEX International Congress.* Barcelona: Universitat Pompeu Fabra, pp. 89–129.

Hanks, P. 2009. The Linguistic Double Helix: Norms and Exploitations. In: Hlaváčková, D. et al. eds. *After Half a Century of Slavonic Natural Language Processing.* Brno: Masaryk University, pp. 63–80.

Hanks, P. 2010. How People Use Words to Make Meanings. In: *Proceedings of the 7th International Workshop on Natural Language Processing and Cognitive Science.* Madeira, Portugal, pp. 1–10.

Hanks, P. 2013. *Lexical Analysis: Norms and Exploitations.* Cambridge, Mass.: The MIT Press.

Hanks, P. 2017. Mechanisms of Meaning. In: Mitkov, R. ed. *Computational and Corpus-Based Phraseology.* Springer, pp. 1–15.

Hanks, P. and Pustejovsky, J. 2005. A Pattern Dictionary for Natural Language Processing. *Revue Française de Linguistique Appliquée* 10(2), pp. 63–82.

Hartmann, I., Haspelmath, M., and Taylor, B. 2013. Valency Patterns Leipzig (ValPal). Available at: http://valpal.info.

Haspelmath, M. 2015. Ditransitive Constructions. *Annual Review of Linguistics* 1, pp. 19–41. Available at: www.annualreviews.org [Accessed: 23 July 2020].

Herbst, T. 2007. Valency complements or valency patterns? In: Herbst, T. and Götz-Votteler, K. eds. *Valency: Theoretical, Descriptive and Cognitive Issues.* Berlin & New York: Mouton de Gruyter, pp. 15–36.

Heyvaert, L. 2003. *A Cognitive-Functional Approach to Nominalization in English.* Berlin & New York: Mouton de Gruyter.

Heyvaert, L., Maekelberghe, C., and Buyle, A. 2019. Nominal and verbal gerunds in present-

day English: aspectual features and nominal status. *Language Sciences* 73, pp. 32–49.

Hilpert, M. 2013. Corpus-based Approaches to Constructional Change. In: Hoffmann, T. and Trousdale, G. eds. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press, pp. 458–475.

Hilpert, M. 2014. *Construction Grammar and Its Application to English*. Edinburgh: Edinburgh University Press.

Hoffmann, T. and Trousdale, G. 2013a. Construction Grammar: Introduction. In: Hoffmann, T. and Trousdale, G. eds. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press, pp. 1–14.

Hoffmann, T. and Trousdale, G. 2013b. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press.

Hopper, P. and Thompson, S. 1980. Transitivity in Grammar and Discourse. *Language* 56(2), pp. 251–299.

Hornby, A. 1954. *A guide to Patterns and Usage in English*. London: Oxford University Press.

Hornby, A. 1975. *A Guide to Patterns and Usage in English*. 2nd ed. London: Oxford University Press.

Hothorn, T. et al. 2006. Unbiased Recursive Partitioning: A Conditional Inference Framework Unbiased Recursive Partitioning: A Conditional Inference Framework. *Journal of Computational and Graphical Statistics* 15, pp. 651–674.

Huber, J. 2017. *Motion and the English Verb: A Diachronic Study*. Oxford, UK: Oxford University Press.

Huddleston, R. 1984. *Introduction to the grammar of English*. Cambridge: Cambridge University Press.

Huddleston, R. 1988. *English Grammar: An Outline*. Cambridge: Cambridge University Press.

Huddleston, R. 1995. The English Perfect Tense as a Secondary Past Tense. In: Aarts, B. and Meyer, C. eds. *The Verb in Contemporary English: Theory and Description*. Cambridge: Cambridge University Press, pp. 102–122.

Huddleston, R. and Pullum, G. 2002. *The Cambridge grammar of the English language*. Cambridge: Cambridge University Press.

Huddleston, R. and Pullum, G. 2005. *A Student's Introduction to English Grammar*. Cambridge: Cambridge University Press.

Hunston, S. and Francis, J. 2000. *Pattern Grammar: A corpus-driven approach to the lexical grammar of English*. Amsterdam: John Benjamins.

Hunston, S. and Su, H. 2019. Patterns, constructions, and local grammar: A case study of 'evaluation'. *Applied Linguistics* 40(4), pp. 567–593.

Hurford, J. et al. 2007. *Semantics: A Coursebook*. 2nd ed. Cambridge: Cambridge University Press.

Ialongo, C. 2016. Understanding the effect size and its measures Lessons in biostatistics. *Biochemia Medica* 26(2), pp. 150–63..

Israel, M. 1996. The Way Constructions Grow In Conceptual Structure. In: Goldberg, A. ed. *Discourse and Language*. Stanford: CSLI Publications, pp. 217–230.

Jenset, G. 2008. Basic statistics for corpus linguistics. In: *Handout for methods seminar in English linguistics*. University of Bergen: Unpublished, pp. 1–20. Available at: http://www.uib.no/People/gje037/statTutorialR.pdf.

Jones, M. 1988. Cognate Objects and the Case Filter. *Journal of Linguistics* 24, pp. 89–111.

Kay, P. 2013. The Limits of (Construction) Grammar. In: Trousdale, G. and Hoffman, T. eds. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press

Kearns, K. 2000. *Semantics*. Hampshire: Palgrave Macmillan.

Kearns, K. 2011. *Semantics (Macmillan Modern Linguistics)*. 2nd ed. Hampshire: Palgrave Macmillan.

Keltner, D. and Bonanno, G. 1997. A study of laughter and dissociation: Distinct correlates of laughter and smiling during bereavement. *Journal of Personality and Social Psychology* 73, pp. 687–702.

Kemmer, S. 2003. Transitivity and voice. In: Frawley, W. ed. *International Encyclopedia of Linguistics*. 2nd ed. Oxford: Oxford University Press, pp. 277–279.

Kersten, A. 1998. A division of labor between nouns and verbs in the representation of motion. *journal of experimental psychology* 127(1), pp. 34–54.

Keyser, S. and Roeper, T. 1984. On the Middle and Ergative Constructions in English. *Linguistic Inquiry* 15(3), pp. 381–416.

Kilgarriff, A., Kovář, V., Krek, S., Srdanović, I., and Tiberius, C. 2010. A quantitative evaluation of word sketches. In: *Proceedings of the 14th EURALEX International Congress*, pp. 372–379.

Kilgarriff, A., Baisa, V., Bušta, J., Jakubíček, M., Kovář, V., Michelfeit, J., Rychlý, P., and Suchomel, V. 2014. The Sketch Engine: ten years on. *Lexicography* 1, pp. 7–36. Available at: https://link.springer.com/content/pdf/10.1007%2Fs40607-014-0009-9.pdf [Accessed: 18 March 2019].

Kipper-Schuler, K. 2005. *VerbNet: A broad-coverage, comprehensive verb lexicon*. University of Pennsylvania, Philadelphia, PA.

Kipper, K., Dang, T., and Palmer, M. 2000. Class-Based Construction of a Verb Lexicon. In: *AAAI/IAAI.*, pp. 691–696.

Kipper, K., Korhonen, N., Ryant, N., and Palmer, M. 2008. A large-scale classification of English verbs. *Language Rescources and Evaluation* 42, pp. 21–40.

Kitazume, S. 1996. Middles in English. *WORD* 47(2), pp. 161–183.

Koenig, J. 2016. Event semantics. In: Riemer, N. ed. *The Routledge Handbook of Semantics*. New York: Routledge, pp. 387–402.

Koller, V. and Mautner, G. 2004. Computer Applications in Critical Discourse Analysis. In: Coffin, C. et al. eds. *Applying English Grammar: Corpus and Functional Approaches*. London: Arnold, pp. 216–228.

Korhonen, A. 2002. *Subcategorization Acquisition*. University of Cambridge.

Korhonen, A. and Briscoe, T. 2004. Extended lexical-semantic classification of English verbs. In: *PRoceedings of the HLT/NAACL Workshop on Computational Lexical Semantics*. Boston, MA, pp. 38–45.

Kuno, S. and Takami, K. 2004. *Functional constraints in grammar*. Philadelphia, PA: John

Benjamins.

Langacker, R. 1990. *Concept, Image, and Symbol: The Cognitive Basis of Grammar (Cognitive Linguistics Research Vol. 1)*. Berlin: Mouton de Gruyter.

Langacker, R. 1987. *Foundations of cognitive grammar. Vol I: Theoretical prerequisites*. Stanford: Stanford University Press.

Langacker, R. 1991. *Foundations of cognitive grammar. Vol II: Descriptive Application*. Stanford: Stanford University Press.

Langacker, R. 2008. *Cognitive Grammar: A Basic Introduction*. Oxford: Oxford University Press.

Larson-Hall, J. and Plonsky, L. 2015. Reporting and Interpreting Quantitative Research Findings: What Gets Reported and Recommendations for the Field. *Language Learning* 65, pp. 127–159.

Lavidas, N. 2013. Null and cognate objects and changes in (in)transitivity: Evidence from the history of English. *Acta Linguistica Hungarica* 60(1), pp. 69–106.

Leech, G. 1987. *Meaning and the English Verb*. 2nd ed. London: Longman.

Leech, G. 2004. *Meaning and the English Verb*. 3rd ed. Harlow, UK: Pearson Education Limited.

Lemmens, M. 1998. *Lexical perspectives on transitivity and ergativity*. Amsterdam: John Benjamins.

Levin, B. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: Chicago University Press.

Levin, B. 2008. A Constraint on Verb Meanings: Manner/Result Complementarity. *Cognitive Science Department Colloqium Series*, Brown University, Providence, RI.

Levin, B. 2009. *Lexical Semantics of Verbs IV: Aspectual Approaches to Lexical Semantic Representation*. Course LSA, UC Berkley. Available at: https://web.stanford.edu/~bclevin/lsa09aspapp.pdf [Accessed: 13 January 2020].

Levin, B. and Krejci, B. 2019. Talking About the Weather: Two construals of precipitation events in English. *Glossa: a journal of general linguistics* 4(1), pp. 1–29.

Levin, B. and Rappaport Hovav, M. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge, Mass.: MIT Press.

Levin, B. and Rappaport Hovav, M. 2005. *Argument realization*. Cambridge: Cambridge University Press.

Levin, B. and Rappaport Hovav, M. 2013. Lexicalized Meaning and Manner/Result Complementarity. In: Arsenijević, B. et al. eds. *Subatomic Semantics of Event Predicates*. Dordrecht: Springer, pp. 49–70.

Levin, L.S. 1986. *Operations on Lexical Forms: Unaccusative Rules in Germanic Languages*. MIT.

Levshina, N. 2015. *How to do linguistics with R data exploration and statistical analysis*. Amsterdam: John Benjamins.

Litkowski, K. 2014. *Pattern Dictionary of English Prepositions*. Available at: http://www.clres.com/db/TPPEditor.html [Accessed: 27 November 2018].

Litkowski, K. 2017. *The Preposition Corpus in Sketch Engine*. Damascus, MD. Available at: http://www.sketchengine.co.uk [Accessed: 15 September 2020].

Liu, D. 2008. Intransitive or Object Deleting? Classifying English Verbs Used without an Object. *Journal of English Linguistics* 36, pp. 289–313.

Löbner, S. 2013. *Understanding Semantics*. London: Routledge.

Lucy, J. 1996. The scope of linguistic relativity: an analysis and review of empirical research. In: Gumperz, J. and Levinson, S. eds. *Rethinking linguistic relativity*. Cambridge: Cambridge University Press, pp. 37–69.

El Maarouf, I. 2013. Methodological aspects of Corpus Pattern Analysis. *ICAME* 37, pp. 119–148.

MacWhinney, B. 1999. The Emergence of Language from Embodiment. In: MacWhinney, B. ed. *The Emergence of Language*. New Jersey: Lawrence Erlbaum Associates, pp. 213–256.

Malchukov, A., Comrie, B., Hartmann, I., Haspelmath, M., Taylor, B., and Wichmann, S. 2010. The Leipzig Valency Classes Project. Available at: https://www.eva.mpg.de/lingua/valency/files/project.php [Accessed: 13 May 2018].

Martin, J.R. et al. 1997. *Working with Functional Grammar*. London: Hodder Arnold.

Martin, J.R. and Matthiessen, C. 1992. Systemic typology and topology. in F. Christie ed., *Literacy in Social Processes: Papers from the Inaugural Australian Systemic Functional Linguistics Conference*. Deakin University, (Centre for Studies of Language in Education, Northern Territory University, 1991), pp. 345–384.

Massam, D. 1990. Cognate Objects as Thematic Objects. *Canadian Journal of Linguistics* 35, pp. 161–190.

Matsumoto, M. 1996. The syntax and semantics of the cognate object construction. *English Linguistics* 13, pp. 199–220.

Matthiessen, C. 1995. *Lexicogrammatical Cartography: English systems*. Tokyo: International Language Sciences.

Matthiessen, C. 1999. The system of transitivity: An exploratory study of test-based profiles. *Functions of Language* 6(1), pp. 1–51.

Matthiessen, C. 2006. Frequency profiles of some basic grammatical systems: An interim report. In: Hunston, S. and Thompson, G. eds. *System and Corpus : Exploring Connections*. London: Equinox, pp. 103–142.

Matthiessen, C. 2014. Extending the description of process type within the system of transitivity in delicacy based on Levinian verb classes. *Functions Of Language* 21(2), pp. 139–175.

Matthiessen, C. 2015. TRANSITIVITY in Systemic Functional Linguistics : achievements and challenges.In: Regina, S., Cabral, S., and Barbara, L. eds. *Estudos De Transitividade: Em Linguística Sistêmico-Funcional*. Santa Maria, Brazil: Editora Programa De Pós-Graduação Em Letras, pp.14-108.

McCoard, R. 1978. *The English perfect: Tense choice and pragmatic inferences*. Amsterdam: North Holland.

McEnery, A. and Gabrielatos, C. 2006. English corpus linguistics. In: Aarts, B. and McMahon, A. eds. *The Handbook of English Linguistics*. Oxford, UK: Blackwell, pp. 33–71.

Meyers, A., Macleod, C., and Grishman, R. 1996. Standardization of the Complement Adjunct Distinction. In: *Proceedings of the Seventh EURALEX International Conference*. Goteborg, Sweden, pp. 141–150.

Michaelis, L. 2013. Sign-Based Construction Grammar. In: Trousedale, G. and Hoffman, T. eds. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press, pp. 133–167.

Mittwoch, A. 1991. In Defence of Vendler's Achievements. *Belgian Journal of Linguistics* 6, pp. 71–85.

Moens, M. and Steedman, M. 1988. Temporal ontology and temporal reference. *Computational Linguistics* 14(2), pp. 15–28.

Moltmann, F. 1990. Nominal and Clausal Event Predicates. *CLS* 24, p. 300=314.

Mourelatos, A. 1978. Events, Processes and States. *Linguistics and Philosophy* 2(3), pp. 415–434.

Neale, A.C. 2002. *More Delicate TRANSITIVITY: Extending the PROCESS TYPE system networks for English to include full semantic classifications*. PhD Thesis. Cardiff University, Cardiff.

Ninio, A. 1999. Model learning in syntactic development: Intransitive verbs. *International Journal of Bilingualism* 3(2–3), pp. 111–130.

O'Donnell, M., Zappavigna, M. and Whitelaw, C. 2009. A survey of process type classification over difficult cases. In: Jones, C. and Ventola, E. eds. *From Language to Multimodality: New Developments in the Study of Ideational Meaning*. London: Continuum, pp. 47–64.

O'Grady, W. 1980. The derived intransitive construction in English. *Lingua* 52(1–2), pp. 57–72.

Olsen, M.B. 1997. *A Semantic and Pragmatic Model of Lexical and Grammatical Aspect*. London and New York: Routledge.

Oxford English Dictionary. 2021. Available at: https://www.oed.com [Accessed: 29 December 2021]

Palmer, F. 1974. *The English Verb*. London: Longman.

Pattern Dictionary of English Verbs. 2021. Available at: https://pdev.sketchengine.eu/ [Accessed: 12 October 2021].

Perek, F. 2015. *Argument structure in usage-based construction grammar*. Amsterdam: John Benjamins.

Perlmutter, D. 1978. Impersonal Passives and the Unaccusative Hypothesis. *Annual Meeting of the Berkeley Linguistics Society* 4(1), pp. 157–190.

Potter, J. 2000. Postcognitive psychology. *Theory & Psychology* 10(1), pp. 31–37.

Pustejovsky, J. 1991. The Syntax of Event Structure. *Cognition* 41, pp. 47–81.

Quirk, R., Greenbaum, S., and Leech, G. 1985. *A Comprehensive Grammar of the English Language*. London and New York: Longman.

Radden, G. and Dirven, R. 2007. *Cognitive English Grammar*. Amsterdam/Philadelphia: John Benjamins.

Rappaport Hovav, M. and Levin, B. 1998a. Building Verb Meanings. In: Butt, M. and Geuder, W. eds. *The Projection of Arguments: Lexical and Compositional Factors*. California, Stanford: CSLI Publications, pp. 97–134.

Rappaport Hovav, M. and Levin, B. 1998b. Morphology and Lexical Semantics. In: Zwicky, A. and Spencer, A. eds. *Handbook of Morphology*. Oxford, UK: Blackwell, pp. 248–271.

Rappaport Hovav, M. and Levin, B. 2010. Reflections on manner/result complementarity. *Syntax, lexical semantics, and event structure* , pp. 21–38.

RCore Team 2021. *R: A language and environment for statistical computing*. Available at: https://www.r-project.org/.

Rips, L.J. 2002. Circular reasoning. *Cognitive Science* 26, pp. 767–795.

Roberts, S., Torreira, F. and Levinson, S. 2015. The effects of processing and sequence organization on the timing of turn taking: a corpus study. *Frontiers in Psychology* 6(1), pp. 1–16. doi: 10.1016/j.jml.2009.09.005.

Van Rompaey, T. 2013. *The development of P + NP + of/to + V(ing) progressive aspect markers*. Katholieke Universiteit Leuven.

Rosca, A. 2013. Framenet and its limitations. The case of entity-specific change-of-state verbs. *Miscelanea. A Journal of English and American Studies* 47, pp. 13–30.

Rosen, S.T. 1996. Events and verb classification. *Linguistics* 34, pp. 191–223.

Rosen, S.T. 1999. The syntactic representation of linguistic events. *Glot International* 4(2), pp. 1–39.

Rothstein, S. 2004a. Derived Accomplishments and Lexical Aspect. In: Gueron, J. and Lacarme, J. eds. *The Syntax of Time*. Cambridge, Mass.: MIT Press

Rothstein, S. 2004b. *Structuring Events: A Study in the Semantics of Lexical Aspect (Explorations in semantics Vol.2)*. Oxford: Blackwell.

RStudio Team 2020. RStudio: Integrated Development for R. Rstudio, PBC, Boston, MA. URL http://www.rstudio.com/.

Ruch, W. and Ekman, P. 2001. The expressive pattern of laughter. In: Kaszniak, A. ed. *Emotion, qualia, and consciousness*. Tokyo: Word Scientific, pp. 426–443.

Ruppenhofer, J., Ellsworth, M., Petruck, M., Johnson, C., and Scheffczyk, J. 2016. *FrameNet II. Extended Theory and Practice*. Berkeley:FrameNet.

Saeed, J. 2009. *Semantics*. 3rd ed. West Sussex: Wiley Blackwell.

Sanfilippo, A., Calzolari, N., Ananiadou, S., Gaizauskas, R., and Saint-Dizier, P. 1999. *EAGLES LE3-4244 Preliminary Recommendations on Lexical Semantic Encoding Final Report*. The EAGLES Lexicon Interest Group.

Sheskin, D. 2011. *Handbook of Parametric and Nonparametric Statistical Procedures*. Boca Raton, FL: Chapman and Hall/CRC Press.

Shirai, Y. 2013. Defining and coding data: Lexical aspect in L2 studies. In: Salaberry, M. and Comajoan, L. eds. *Research Design and Methodology in Studies on L2 Tense and Aspect*. Berlin, Boston: De Gruyter Mouton, pp. 271–308.

Sinclair, J. 2003. *Reading Concordances: An Introduction*. London: Pearson Education Limited.

Sirkin, R. 2006. *Statistics for social sciences*. 3rd ed. London: Sage publications.

Slobin, D. 2004. The many ways to search for a frog: Linguistic typology and the expression of motion events. In: Strömqvist, S. and Verhoeven, L. eds. *Relating Events in Narrative 2: Typological and Contextual Perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 219–257.

Smith, C. 1978a. Jespersen's 'move and change' class and causative verbs in English. In: Jazayery, M. A. et al. eds. *Linguistic and Literary Studies in Honor of Archibald A. Hill, Vol 2: Descriptive Linguistics*. The Hague: Mouton de Gruyter, pp. 101–109.

Smith, C. 1978b. Jespersen's "move and change" class and causative verbs in English. In: Jazayery, M. et al. eds. *Linguistic and Literary Studies in Honor of Archibald A. Hill, Vol 2: Descriptive Linguistics*. The Hague: Mouton de Gruyter, pp. 101–109.

Smith, C. 1991. *The Parameter of Aspect (Studies in Linguistics and Philosophy Vol. 43)*. Dordrecht: Kluwer Academic Publishers.

Somers, H. 1984. On the validity of the complement-adjunct distinction in valency grammar. *Linguistics* 22(4), pp. 507–530.

Sorace, A. 2000. Gradients in auxiliary selection with intransitive verbs. *Language* 76(4), pp. 859–890.

Sweet, H. 1891. *A new English grammar : logical and historical*. Oxford: Clarendon Press.

Swier, R. and Stevenson, S. 2004. Unsupervised Semantic Role Labelling. In: *Proceedings of EMNLP 2004.*, pp. 95–102.

Talmy, L. 1985. Lexicalization Patterns: Semantic Structure in Lexical Forms. In: Shopen, T. ed. *Language Typology and Syntactic Description. Volume 3: Grammatical Categories and the Lexicon*. Cambridge: Cambridge University Press, pp. 57–149.

Talmy, L. 2000. *Toward a Cognitive Semantics, Vol. II: Typology and Process in Concept Structuring*. Cambridge, Mass.: MIT Press.

Tawa, W. 2009. *Japanese Stage-Step Course: Grammar Textbook: Grammar-Reference*. New York: Routledge.

Taylor, J. 2003. *Linguistic categorization*. Oxford, UK: Oxford University Press.

Tenny, C.L. 1987. *Grammaticalizing Aspect and Affectedness*. PhD Thesis. Massachusetts Institute of Technology, Massachusetts.

Tenny, C.L. 1995. Reviewed Works: English Verb Classes and Alternations by Beth Levin. *Language* 71(1), pp. 144–145.

Teo, P. 2000. Racism in the News: A Critical Discourse Analysis of news reporting in two Australian newspapers. *Discourse and Society* 11(1), pp. 7–49.

Teubert, W. 2007. Sinclair, pattern grammar and the question of hatred. *International journal of corpus linguistics* 12(2), pp. 223–248.

The British National Corpus, version 3 (BNC XML Edition). 2007. Available at: http://www.natcorp.ox.ac.uk/.

Thompson, G. 1996. *Introducing Functional Grammar*. London: Arnold.

Thompson, G. 2004. *Introducing Functional Grammar*. 2nd ed. London: Arnold.

Thompson, G. 2014. *Introducing Functional Grammar*. 3rd ed. London: Arnold.

Thompson, G. 2015. Pattern Grammar and Transitivity Analysis. In: Groom, N. et al. eds. *Corpora, Grammar, Text and Discourse. In honour of Susan Hunston*. Amsterdam: John Benjamins, pp. 21–42.

Thorne, S. 2008. *Mastering Advanced English Language*. 2nd ed. Hampshire: Palgrave Macmillan.

Timyam, N. and Bergen, B. 2010. A contrastive study of the caused-mtion and ditransitive constructions in English and Thai: Semantic and pragmatic constraints. In: Boas, H. C. ed. *Contrastive Studies in Construction Grammar*. Amsterdam/Philadelphia: John Benjamins Publishing Company, pp. 137–168.

Tognini-Bonelli, E. 2001. *Corpus Linguistics at Work*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

van Trijp, R. 2015. Cognitive vs. generative construction grammar: The case of coercion and argument structure. *Cognitive Linguistics* 26(4), pp. 613–632.

Trinh, N., Hoa, P., and Phuc, T. 2017. Some suggestions on how to identify and classify behavioral processes in english and vietnamese. *VNU Journal of Foreign Studies* 33(3), pp. 120–132.

Tucker, G. 2014. Process types and their classification. In: *Caught in the Middle - Language Use and translation. AFestschrift for Erich Steiner on the Occasion of his 60th Birthday*. Saarbrücken: Verlag universaar University of the Saarland, pp. 401–416.

Velupillai, V. 2012. *An Introduction to Linguistic Typology*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

Vendler, Z. 1957. Verbs and Times. *The Philosophical Review* 66(2 Duke University Press on behalf of Philosophical Review), pp. 143–160.

Vendler, Z. 1967. *Linguistics in philosophy*. Ithaca [N.Y.]: Cornell University Press

Verhoeven, E. 2010. Agentivity and stativity in experiencer verbs: Implications for a typology of verb classes. *Linguistic Typology* 14, pp. 213–251.

Verkuyl, H.J. 1972. *On the Compositional Nature of the Aspects*. Dordrecht: Reidel.

Verkuyl, H.J. 1989. Aspectual classes and aspectual composition. *Linguistics and Philosophy* 12, pp. 39–94.

Vernice, M. and Sorace, A. 2018. Animacy effects on the processing of intransitive verbs: an eye-tracking study. *Language, Cognition and Neuroscience* 1, pp. 1–17.

Viberg, Å. 2014. Review of Hanks (2013): Lexical Analysis: Norms and Exploitations. *Functions of Language* 21(3), pp. 366–373.

Visser, F. 1963. An Historical Syntax of the English Grammar. In: Waal, F. de ed. *Primates and Philosophers: How Morality Evolved*. Vol I-IIIb. Princeton, NJ: Princeton University Press.

Walton, G. 1965. Voice and Transitive and Intransitive Verbs. *American Speech* 40(3), pp. 186–192.

Wardhaugh, R. 2003. *Understanding English Grammar: A Linguistic Approach*. 2nd ed. Oxford, UK: Blackwell Publishing Ltd.

West, M. 1953. *A General Service List of English Words*. London: Longmans.

Whorf, B. 1956. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf*. J.

B. Carr. Cambridge, Mass.: MIT Press.

Widdowson, H. 1988. Grammar, and Nonsense, and Learning. In: Rutherford, W. and Smith, S. eds. *Grammar and Second Language Teaching*. Boston: Heinle, pp. 145–155.

XTAG Research Group 2001. *A Lexicalized Tree Adjoining Grammar for English*. Technical report.

Zaenen, A. 1987. Are there unaccusative verbs in Dutch. In: *Proceedings of NELS 17*. Amherst: U Mass GLSA

Zaenen, A. 1993. Unaccusativity in Dutch: Integrating syntax and lexical semantics. In: Pustejovsky, J. ed. *Semantics and the Lexicon*. Dordrecht: Springer, pp. 129–161.

Zwarts, J. 2005. Prepositional Aspect and the Algebra of Paths. *Linguistics and Philosophy* 28(6), pp. 739–779.

Zwarts, J. and Gärdenfors, P. 2016. Locative and Directional Prepositions in Conceptual Spaces: The Role of Polar Convexity. *Journal of Logic Language and Information* 25(1), pp. 109–138.