

CARDIFF UNIVERSITY

DOCTORATE IN EDUCATIONAL PSYCHOLOGY

2015

Can whole-class intervention positively enhance executive functioning and specifically self-regulation in the classroom? A cognitive neuropsychology based enquiry

Rob Long

ABSTRACT

Informed by educational and cognitive neuropsychology, a quantitative approach was adopted to investigate if specific self-regulatory executive functioning skills could be improved in a mainstream class of primary pupils (N = 60). An intervention programme was delivered to an experimental group and using a standardised questionnaire, results were compared with those of a control group. Though the findings failed to reach statistical significance, tentative inferences concerning the effectiveness of targeted group interventions over universal ones are made. The ongoing debate concerning the contribution of cognitive neuroscience to education is explored in conjunction with the need for practising educational psychologists to offer evidence-based behaviour management interventions for class teachers.

Acknowledgements

It was my very good fortune to have Dr. Simon Claridge who, due to circumstances, became my tutor for the final part of my journey. His encouragement and intellectual rigour were invaluable.

Special thanks go to my family - Chris, Jenni and Joe for being there, through the lows and highs, you always made the difference.

I also wish this study to be in memory of Dr. Simon Griffey, who was initially my course tutor. Simon combined humour with academic determination, both which were needed and much appreciated.

Finally, thanks go to the staff and pupils of the school who so willingly participated in this study.

LIST OF ABBREVIATIONS

ADD	-	Attention Deficit Disorder
ADHD	-	Attention Deficit/Hyperactivity Disorder
ASD	-	Autistic Spectrum Disorder
AEP	-	Association of Educational Psychologists
BPS	-	British Psychological Society
BRIEF	-	Behaviour Rating Inventory of Executive Function
BRI	-	Behaviour Regulation Index
CEO	-	Chief Executive Officer
CAMHS	-	Child and Adolescent Mental Health Services
CAT	-	Computerised Tomography
CD	-	Conduct Disorder
DECP	-	Division of Educational and Child Psychology
DCSF	-	Department for Children, Schools and Families
DES	-	Department for Education and Science
DFE	-	Department for Education
DfES	-	Department for Education and Skills
DSM	-	Diagnostic and Statistical Manual of Mental Disorders
UNESCO	-	United Nations Educational, Scientific and Cultural n Organisation
EBD	-	Emotional and Behavioural Difficulties
EBP	-	Evidence-based practice
ECP	-	Education and Child Psychology
EEG	-	Electroencephalograph
EPiP	-	Educational Psychology in Practice
EFS	-	Executive Functioning Skills
EP(s)	-	Educational Psychologist
fMRI	-	Functional Magnetic resonance imaging
MRI	-	Magnetic resonance imaging
INSET	-	In-Service Training
LD	-	Learning disability

LEA	-	Local Education Authority
MEG	-	Magneto-encephalograph
NHS	-	National Health Service
OCD	-	Obsessional compulsive disorder
PET	-	Positron emission tomography
PET-CT	-	Positron emission tomography-computed tomography
RCTs	-	Randomised controlled trials
SEAL	-	Social Emotional Aspects of Learning
SEBDA	-	Social, emotional and behavioural difficulties association
SEBD	-	Social, Emotional and Behavioural Difficulties
SEL	-	Social Emotional Learning
SEN	-	Special Educational Needs
SENCO	-	Special Educational Need Coordinator
TDA	-	Training and Development Agency
TMS	-	Transcranial magnetic stimulation

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
LIST OF ABBREVIATIONS	v
TABLE OF CONTENTS	vii
LIST OF APPENDICES	xi
FIGURES AND TABLES	xii
CHAPTER 1: INTRODUCTION	1
1.1 Overview	1
1.2 Epistemological position	1
1.3 Behaviour and Government reports	3
1.4 Educational Psychologists and classroom behaviour	3
1.5 Behaviour defined	4
1.5.1 Psychological perspectives.....	5
1.5.2 Social perspective	6
1.5.3 Biological perspective	6
1.6 The biopsychosocial perspective	7
1.7 The role of the classroom teacher	8
1.8 Cognitive neuropsychology and executive functioning skills	8
1.9 Relevance to schools and teachers	10
1.10 Relevance to educational psychologist's role	11
1.11 Contribution to new knowledge	12
1.12 Summary	12
1.13 Outline of the forthcoming chapters	13
CHAPTER 2: LITERATURE REVIEW	15
2.1 Historical background to the study of children and the emergence of Educational Psychology	16
2.1.1 British Psychological Society	17
2.1.2 Educational psychology and psychology	18
2.2 Practising educational psychologists, classroom behaviour, research and publications	20

2.2.1 British Psychological Society	20
2.2.2 Association of Educational Psychologists.....	21
2.3 Approaches to school behaviour	21
2.3.1 Individual V whole school	21
2.4 Definitions of behaviour and behavioural difficulties	24
2.4.1 Intervention implications	26
2.5 Government reports into school behaviour	27
2.5.1 Education legislation	27
2.6 Social, Emotional Aspects of Learning (SEAL)	30
2.7 Classroom behaviour and teachers	34
2.8 Salamanca statement	36
2.9 Classroom behaviour management, educational psychology and neuro-science..36	
2.9.1 Educational psychologists and theoretical models	37
2.9.1.1 <i>Individual case work v whole class work class</i>	37
2.9.1.2 <i>Teaching behavioural skills</i>	39
2.10 Cognitive neuropsychology	40
2.10.1 Cognitive neuropsychology and neuroscience	41
2.11 Brain research and causality	43
2.12 Cognitive neuropsychology and executive functioning skills	44
2.13 Executive functioning skills and maturation	47
2.13.1 Maturation and time	49
2.13.2 Developmental variation	50
2.14 Executive functioning skills and gender.....	50
2.15 Executive functioning skills and problematic behaviour	51
2.15.1 Executive functioning skills and childhood conditions.....	53
2.15.2 Executive functioning skills and Attention Deficit/Hyperactivity Disorder	54
2.16 Education initiatives and neuroscience	53
2.16 Research directly related to the current study	53
2.17 Summary of the literature review	59
2.18 Rationale for the current study based on the literature to date	60
2.19 Objectives and hypotheses of the study	61

CHAPTER 3: EPISTEMOLOGICAL CONSIDERATIONS	62
3.1 Epistemological position - research paradigm	62
3.1.1 Scientific approach and causality	62
3.1.2 Constructivism - ideographic - understanding	64
3.1.3 Critical theory	66
3.2 Evidence-based practice	67
3.3 Position of the researcher	69
3.4 Rational for a quantitative data collection	71
CHAPTER 4: METHODOLOGY	72
4.1 Objectives and specific hypotheses of the study	72
4.2 Ethical considerations	72
4.3 Design	73
4.4 Materials	74
4.4.1 Quantitative measurement of behaviour regulation	74
4.4. 1. 1 Rater consistency	74
4.5 Intervention programme	75
4.5.1 Programme materials	76
4.5.2 Session protocols.....	77
4.6 School and participants	79
4.6.1 School selection	79
4.6.1.1 School inclusion criteria	80
4.7 Participant inclusion and exclusion criteria	80
4.8 Sample characteristics	80
4.9 Procedures	83
4.9.1 Anonymity	84
4.9.2 Stage 1: Gatekeeper letters, information and consent	85
4.9.3 Stage 2: Pilot group	86
4.9.4 Stage 3: Data collection at Time 1	86
4.9.5 Stage 4: Intervention programme	87
4.9.6 Stage 5 Data collection at Time 2	87

4.9.7 Stage 6: Debriefing information	87
4.10 Results	87
4.11 Statistical analysis	88
4.11.1 Main effects	90
4.11.2 Interaction effects	90
4.11.3 Ancillary analysis	92
CHAPTER 5: DISCUSSION AND CONCLUSION	96
5.1 The findings	96
5.2 Data: direction not destination	98
5.3 Whole class teaching, motivation and the intervention programme	99
5.4 Evidence-based education initiative	100
5.5 Changing perspectives	100
5.6 Research limitations of the study	102
xxxxxxx5.6.1 Sampling	103
xxxxxxx5.6.2 Sample relationship to the parent population	104
bbbbbb 5.6.3 Bias, demand characteristics and the Hawthorne effect	104
xxxx 5.6.4 Measurement issues	105
5.7 Changing role of the EP	107
5.8 Study value and further research	107
REFERENCES	110
APPENDICES	136
LIST OF APPENDICES	
Appendix A: Ethical considerations	137
Appendix B: Three sub-scales for Behaviour Regulation Index	140
Appendix B1: Behaviour Regulation Index Questionnaire	142
Appendix C: Rater consistency/inconsistency scale	144
Appendix D: Programme intervention	145

Appendix E: Example session	182
Appendix F: National curriculum scores	197
Appendix G: Gatekeeper letters	
Appendix G1: Gatekeeper letter to headteacher	201
Appendix H: Information, consent and opt out letters	
Appendix H1: Information and consent letter to class teachers	204
Appendix H2: Home information and opt out form	207
Appendix H3: Information and out sheet for pupils	211
APPENDIX I: Teacher assessment scores for experimental and control groups	
bbbbbb at T1 and T2	214
Appendix J: Rater consistency questions	218
Appendix K: Pupil rating of sessions	219
Appendix L: Debriefing XXX	
Appendix L1: Headteacher debrief information	221
Appendix L2: Pupil debrief information	223
Appendix L3: Teacher debrief information	224
xxxxx Appendix L4: Home debrief information	226

FIGURES AND TABLES

Tables

Table 1: Summarises the activities used in each session.....	79
Table 2: Gender frequencies	81
Table 3: Experimental and control group SEN characteristics	82
Table 4: School assessment scores	83
Table 5: Rater consistency scores	86

Table 6: BRIEF scores at T1 and T2	89
Table 7: Comparison of boys scores in experimental and control group.....	92
Table 8: Experimental group scores frequency of change	93
Table 9: Consideration of the BR DIFF for scores at T1 over 30.....	94

FIGURES

Figure 1: Gender comparison	81
Figure 2: Mean scores for experimental and control groups at start and finish of the study.....	89
Figure 3: Interaction effect of intervention and time	91

CHAPTER 1: INTRODUCTION

A study, informed by educational psychology and cognitive neuropsychology, to investigate the efficacy of a targeted intervention programme for behavioural self-regulatory executive functioning skills in year six primary children.

1.1 Overview

One of the unchanging educational concerns remains pupil and student's behaviour. Successive governments have investigated it, (DES, 1989 and DfES, 2005) schools have been considered under-performing because of it and behaviour issues have always attracted media attention. Since the 1980s government reports and policy have informed both attitudes and practices towards behavior (Canter, & Canter, 1992; Wheldall, 1984; DES, 1989). The argument that poor behaviour was essentially a 'within child' matter, gradually gave way to more complex accounts, the effective school movement providing insight into how the very organisation of schools in developed countries could contribute to both good or poor behaviour of its learners (Parsons, 2012).

At its heart this study is concerned with the role and contribution of educational psychology and cognitive neuropsychology in improving whole class behaviour. The emergence of cognitive neuropsychology as a discipline in its own right has significantly increased understanding of the complex relationship between the human brain and behaviour. Of special interest are the skills that seem to exist in the neural pathways of the pre-frontal cortex. These are generically known as executive functioning skills (EFS) and are considered to be what makes humans uniquely human (Cooper-Kahn and Dietzel, 2008; Moraine, 2012; Dawson and Guare, 2010). The ability to plan, defer gratification, control feelings and persist with goals when faced with obstacles separates humans from most other species. A sub-group of these skills are concerned with self-regulatory control of behaviour. In the classroom these are essential for learners to be successful (Dawson and Guare, 2009; Meltzer, 2010).

1.2 Epistemological position

The historical roots of educational psychology as a distinct branch of the British Psychological Society, can be understood as a result of the changing needs of society. Enabling children to benefit from universal education was becoming a significant issue at the

beginning of the 20th century. This was a result of the growing concerns towards children of poor families being used as cheap labour in the factories, also crimes committed by children were increasing. Education was seen as a panacea that would solve many of these problems. Not only would schooling free families from industrial work it would also develop basic skills in children essential for their later work as industrial employees.

Much of psychology at this time was transcendental and speculative in contrast to the emerging science of sociology, which in contrast, influenced by Comte, was beginning to employ scientific methods to explain and predict social behaviour. In the early part of the 20th century. Cyril Burt emerged as a major influence on the development of educational psychology. Considered to be the first official educational psychologist in 1913, Burt pioneered the application of theoretical psychology to educational issues. His influence spanned many different worlds, including scientific research, educational administration, teacher training and popular journalism (Wooldridge, 1994, p. 73). Significantly he was instrumental in advocating the view that children's ability could be psychometrically assessed and educational classifications based on the results. At this time psychoanalysis was emerging as an introspective means of investigating different aspects of human behaviour. While not entirely opposed to psychoanalysis as a method for studying neuroses, experimentation with statistical analysis was his preferred methodology.

Today, most EPs use some variation of scientific methodology. That is, a theory will be used to generate hypotheses, data is collected which will either confirm or refute the original hypothesis. As a result those approaches that failed to produce replicable data have had less influence on the direction educational psychology has taken. This study will present arguments that will endorse the view that psychology is a science (Cameron, 2006) and that educational psychology can legitimately use a positivistic research methodology to investigate in-class behaviour. This position is supported through an investigation into both epistemological issues and research methodologies. The endorsed research design is one that will allow causal relationships between variables to be quantified and studied. A consequence of this position is that a nomothetic as opposed to an ideographic research design is endorsed. Such a nomothetic analysis will make it possible for generalisations to be made as to how the key variables can be expected to function in comparable locations.

1.3 Behaviour and Government reports

Efforts to improve school behaviour have followed from various government initiated reports; these are briefly summarised. One of especial relevance is the Learning Behaviour report (DfES, 2005) which resulted in a programme commonly referred to as Social, Emotional Aspects of Learning (SEAL). This is a framework for improving the emotional literacy as well as the behaviour of all learners. The debate as to its efficacy is examined, in the light of the significant difficulty in that schools differ in how they implement the programme, making rigorous comparable research into its effectiveness problematical (Humphrey, 2013). Its inclusion is necessary on account of its overlap in key areas of this study.

The present study has similarities to the approach endorsed by SEAL in that it applies a universally delivered programme to a whole class of learners. This ensures that all learners have the opportunity to benefit from the programme. It differs from SEAL, which has its theoretical base in developmental psychology (Weare, 2010), in drawing on scientific knowledge derived from cognitive neuropsychological research. The implications of this study will be to investigate the usefulness of a universal approach to improve behaviour through a whole class intervention programme.

1.4 Educational Psychologists (EPs) and classroom behaviour

The extent to which practising educational psychologists have studied in-class behaviour is considered through reviewing the two main journals in which their research is published: namely, Educational Psychology in Practice (EPiP) published in the UK by the Association of Educational Psychologists (AEP) and Educational and Child Psychology published by the British Psychological Society (BPS).

The value biases that editors of journals have will influence which articles are considered to be appropriate for publication. The theoretical models that inform such are also considered, helping to establish the extent to which executive functioning skills as studied by educational psychologists (EPs) and cognitive neuropsychologists have been researched and reported.

Any investigative research needs to have definite parameters. This study has considered key journals published from the date of the UNESCO Salamanca Statement (1994) an agreement made by some 92 governments regarding the right for all children to be educated. It was also forthright toward the inclusion of children with additional needs into mainstream schools. One implication pertinent to this study was that learners with social, emotional and behavioural difficulties were also to be included whenever possible into their mainstream schools.

In supporting schools in their management of behaviour a frequently debated issue is whether EPs should employ a casework approach or consider behaviour as being a whole class/school issue (Curran, Gerch and Wolfendale, 2003; Boyle and Lauchlan, 2009). As this study uses a whole class approach it is an issue that receives consideration. As with many complex matters the answer is rarely simple or one sided.

1.5 Behaviour defined

Being clear as to what is meant by ‘behaviour’, good or otherwise, is a challenge in itself. The term ‘behaviour’ is complex and ambiguous. Behaviour considered normal in one class or school may not be in another. Visser wrote, in 2003 of chronic definition difficulties, and the same view can be said to persist today. An appreciation of the changing perspectives held towards school behaviour is a useful starting point for any study concerned with improving pupil behaviour. How behaviour is conceptualised will reflect philosophical as well as educational values. These in turn will shape a school’s ethos, its policies on how it will promote appropriate behaviours and respond to inappropriate ones.

In this thesis behavior that is considered inappropriate for whatever reason will be referred to as ‘problematic behaviour’. This is instead of the more commonly used term ‘problem behaviour’. The latter more readily carries the possibility of a pejorative interpretation, for example, problem equals wrong in some way. The term problematic behaviour avoids seeing the child as having the problem and consequently being labelled a ‘problem child’. The problematic behaviour could equally be caused by an inappropriate curriculum or the fact that the child is being bullied.

Problematic behaviour is essentially a general term that describes a set of loosely related characteristics. Students labelled as having problematic behaviour make up a very heterogeneous group (Cooper, 1999). They may share the same label but for very different reasons. In the twentieth century the dominant explanations for problematic behaviours have been seen as biological, psychological and social. A consideration of these perspectives will reflect the complexity involved in understanding and developing interventions for such behaviours. This will also elucidate the particular focus of the following research. Namely, that self-regulatory executive functioning skills, can be considered as a useful hypothetical construct from a biological and psychological perspective, and these form part of and relate with other processes involved in the causation of problematic behaviour.

1.5.1 Psychological perspectives

There have been numerous psychological schools of thought with special relevance to problematic behaviour. The most systematic one for analysing problem behaviour was behaviourism. This led to the development of applied behavioural analysis, which still remains influential in educational contexts (Lewis, Lewis-Palmer, Newcomer and Stichter, 2004). In contrast to this, the analytical tradition, historically based on Freud's model of the human psyche, namely, the id, ego and super-ego continued. The influence of this approach can be seen in such educational initiatives as the Nurture Group movement (Bennathan and Boxall, 1996). Also related to this approach is the growing significance of attachment theory (Bowlby, 1971, 1975; & 1980) in understanding and supporting children and young people with behavioural difficulties; and resources for its application and practical ideas for school staff have increased considerably. (Geddes, 2006; Taylor, 2010; Hughes, 2006 & Golding, et al. 2013). This approach has also been particularly supported by biological evidence concerning the impact poor attachment has on brain development. (Gunnar, 1998; Schore, 2000).

More recently the behavioural approach has been challenged by the emergence of a cognitive model (Stallard, 2013). Behavioural interventions rely on controlling inappropriate behaviour and depend heavily on external and mainly adult-centred control techniques. The contrasting cognitive approach stresses the importance of teaching learners self-control techniques (Polsgrove and Smith, 2004). This model believes in the ability of individuals to

exert control over their behaviour through internal cognitive processes.

While both cognitive and behavioural models differ in their underlying assumptions a new model has drawn them together in the form of a cognitive-behavioural approach (Albano & Kendall, 2002).

1.5.2 Social perspective

The social or sociological perspective views problem behaviour more as an individual's rational response to irrational circumstances. Such behaviour is created through macro-social and political factors (Cooper, 1999). Through an interpretative perspective problem behaviour or deviant behaviour is considered as being constructed by powerful parties in any interaction. The Hargreaves, Hester and Mellor (1999) study argues that through teachers' inferences and expectations a deviant identity can be adopted by targeted pupils. Such a model challenges practitioners, in that if deviant behaviour is a rational response to negative circumstances, then it should be the circumstances that are changed not the individual. To not do so is to collude with the causes of the problem behaviour (Cooper, 1999).

1.5.3 Biological perspective

There is more unknown than known regarding how the brain relates to behaviour (Blair, 2002). It is accepted that biological processes that are partly the result of genetic inheritance contribute to a child's development (Santrock, 2006). Theorists have considered biological influences that are concerned with universal needs or drives. For example Maslow's hierarchy (1970) presented a biologically-based need theory followed by Glasser's (1993) control theory. Both theories postulated biological needs that shaped observed behaviours, and both imply that if basic needs are unmet then unacceptable behavioural choices will be met in an attempt to satisfy them. Individual differences are considered to be the result of genetic and neurological factors. However, improved research techniques into brain functioning continue to suggest links between brain and behaviour. For example, evidence supports the view that childhood disorders such as ADHD (Holowenko, 1999) and ASD (National Autistic Society, 2015) are the result of genetic factors.

Of special relevance to this study is the growth of cognitive neuropsychology that links a biological and psychological approach.

While each of the above perspectives emerged at different times in the last century they continue to influence how problematic behaviours are construed. Increased understanding of problematic behaviour shows how interventions can be made at different levels. Drawing on the different models an intervention can be made at the individual level, or the interaction between the learner and their immediate environment. Recourse to bio-medical interventions is much rarer. In an educational context, interventions occur typically at the individual and educational level. It seems fairer today to argue that problematic behaviour is a multi-layered issue with different factors each playing a role.

1.6 The biopsychosocial perspective

A model that emerged to unite the different accounts of problematic behaviour is the biopsychosocial perspective. This model grew out of clinical medicine that traditionally relied on a biomedical model. The medical model was challenged by Engel (1977) who argued that a person's health and illness should be understood in the widest context. This meant that biological, psychological and social factors each needed to be systematically considered, including their complex interactions with one another. Whereas the medical model was deterministic and reductionist the biopsychosocial model is dynamic, interactional and all-inclusive. This means that interventions to manage and support learners who face problematic behaviours can be at different levels and are not mutually exclusive to each other. For example, a learner can be supported through learning new skills while adults improve the relationship and explore curriculum issues at the same time.

To summarise, while this study is based in cognitive neuropsychology, it is by no means reductionistic. It is firmly placed under the wider auspices of a biopsychosocial model. The intervention explored in the study is concerned with developing self-control skills in a class of primary pupils. Other interventions to improve such skills could equally be at the curriculum and school level. Drawing on neurological studies of where key processes occur in the brain, psychological constructs can be developed to link observable behaviours to underlying brain processes. While still in its early phase of development, based on cognitive neuropsychology, testable hypotheses can be developed which can assist in the ongoing need to improve behaviour in schools. Such will confirm the value of the biopsychosocial

approach to a range of school issues.

1.7 The role of the classroom teacher

The professionals that these issues matter most to are, of course, classroom teachers. On a daily basis they are confronted with a range of behavioural issues which they have to resolve. Advice on how to manage classroom behaviours is readily available, whether the teachers are new to, or well established in, the teaching profession. There are few education publishers that do not have at least one title on support and advice for teachers to managing behaviour. The pivotal role that teachers are seen to hold on behavioural matters is revealed through a consideration of the key government sponsored reports into school behaviour. A frequent recommendation is the need for teachers to be better trained in behaviour and classroom management skills (DES, 1989). Known as the Elton report, it argues that while such classroom skills are necessary, they are not sufficient to solve the problem of difficult pupil behaviour. As will be detailed, there are key skills that all learners need. A key role for teachers can be to teach these skills as if it were another curriculum area (Ellis and Tod, 2009).

Previous work in this area of classroom behaviour management has followed various paths and reached varying conclusions. Among those, the use of behaviour modification principles and techniques for example (Blair, Umbreit and Bos , 1999; Conroy and Fox, 1994) and the systemic approach which looked more at the complex interaction between environmental variables (Stoker, 1987; Boyle and MacKay, 2007; Fox, 2009) have both remained influential. The main focus of this study was the understanding of aspects of classroom behaviour that follow from an understanding of how brain maturation enables children to take control of their own behaviour. Such understanding is the direct result of cognitive neuropsychology.

1.8 Cognitive neuropsychology and executive functioning skills

The emergence of cognitive neuropsychology as a distinct science has been to a large degree, a consequence of the research techniques that have been developed. It was through an understanding of how neurons transmitted messages and the energy needed for such activity that led to scientific breakthroughs in how the brain could be studied. These techniques were mainly driven by medical needs for better treatments of pathological conditions (Williams,

Imamura and Fregni, 2009). Techniques such as functioning magnetic resonance imaging enabled researchers to localise brain functions in a way never before possible (Savoy, 2002).

While psychologists have for some time believed the pre-frontal cortex to be central in the control of such skills as planning and goal directed behaviour, neuropsychological evidence has confirmed this and extended knowledge on the role of both cognitive and behavioural processes (Monchi, Petrides, Petre, Worsley and Dagher, 2001; Nelson, 1976). Cognitive neuropsychology is able to postulate hypothetical constructs that link mind and matter to explain how the human brain enables complex phenomena such as focused attention to be maintained, and how behaviour may be goal directed (McCloskey, Perkins and Divner, 2009).

The need for learners to have self-regulatory skills in controlling their own behaviour has figured in many approaches to classroom behaviour. Canter and Canter's Assertive Discipline Programme (1992) promoted self-discipline through giving choices to learners, with fixed negative consequences for inappropriate ones, drawing on behaviour modification principles. Studies have focused on teaching self-regulation to learners classified as having social, emotional and behavioural difficulties. Mowat (2010) found that using a cognitive-based intervention programme, self-regulatory behaviour skills could be enhanced. Davies and Witte (2000) reduced unwanted classroom verbalisations by teaching students self-management skills. Increasingly, research links behaviour to neurological development in a cognitive neuropsychological framework (Duncan, 1986; Feinberg and Farah, 2003). This study focuses on the role of self-regulatory behaviour skills, a subset of executive functioning skills (EFS) that are located in the neural pathways of the pre-frontal cortex.

Studies have shown that without such skills children experience problems in controlling their behavior (Batmanghelidj, 2007; Nadeau and Nolin, 2013; Barkely, 2006). A literature search of EPiP) and Educational and Child Psychology revealed little research into classroom behaviour involving these core skills. An exception, reported in the journal *Emotional and Behavioural Difficulties* was one by Frederickson, Jones, Warren, Deakes and Allen (2013) who included executive functioning skills as one aspect of their study aimed at improving the behaviour of learners in a special school. As this study has similarities to the present one some consideration is necessary. Some 29 pupils were involved, 27 were male with a mean

age of 8.72 years (SD = 1.71). Each was assessed before and after the intervention using the *Behaviour Rating Inventory of Executive Function (BRIEF)*; Gioia et al 2000). The intervention experienced by the pupils was *Let's Get Smart* which is a multi-stranded behaviour intervention programme developed by one of the authors who was a practising EP. It was successfully concluded that a structured intervention programme improved the ability of learners with social, emotional and behavioural difficulties (SEBD) to improve their ability to control their own behaviour. For this study the potential for neuroscience to inform an educational initiative was endorsed. Whether such a study on different populations would produce similar results remains to be determined.

1.9 Relevance to schools and teachers

There is no shortage of advice and guidelines for schools and teachers to improve their management of behaviour. A specific focus is frequently the need for classroom teachers to be better trained in behaviour management techniques. In many schools it is the role of rewards and sanctions that are relied upon to achieve this. Critics of this approach (Kohn, 1993) have gradually become more credible in the light of behaviour remaining a serious concern for schools. For many the emphasis on environmental factors reflected the main aim which was to control learners. Through the influence of such major thinkers as Vygotsky (1986) learning began to be viewed through new pedagogical models. Learning was seen as a social activity, with teachers facilitating cognitive growth in learners and thereby increasing their self-control over their own behaviour. This cognitive approach can be seen in the influential work of Dweck (2000) who has popularised the concept of 'mindsets' as a way of making sense of how learners perceive their ability or inability to learn.

In the search for improved ways to manage behaviour, cognitive neuropsychology has emerged as having a significant contribution to make to both the understanding of in-class behaviour as well as practical recommendations to improve it. For some the link between brain and behaviour is still too little understood to be of real value to practicing teachers (Varma, McCandliss, and Schwartz 2008). This has not prevented many brain-based packages from being promoted. This study provides an opportunity for a cognitive neuropsychology model to be investigated with respect to developing whole class interventions aimed at improving classroom behaviour.

Providing evidence-based research for schools and especially for class teachers will contribute to the ongoing debate as to how behaviour in school can be most effectively improved. While schools currently use techniques aimed at developing the learner's self-control, under the generic heading of SEAL, many professionals consider that hard evidence validating this approach is yet to be provided (Humphrey, 2013).

1.10 Relevance to the educational psychologist's role

This study has value in several areas. Firstly, as EPs give advice to teachers on behaviour management, it follows that such advice will be strengthened if it is evidence based. Secondly, improving behaviour at a whole class level has benefits and costs. It is a more cost effective way than targeting individuals who either have or may develop behavioural difficulties. It also removes the danger of labeling pupils. However for those who are not at risk of developing SEBD their time could be more judiciously used on other studies more useful for them.

A core theme of this thesis is the desire to establish evidence-based practice as the guiding principle when considering in-school behavioural interventions. The importance of evidence-based practice for educational psychologists is reflected in the recent introduction of a three year doctoral programme replacing the previous twelve month course in England, Wales and Northern Ireland. Central to this programme is the emphasis on research and evaluation skills, the reasoning being that advice concerning approaches and methods should be based on "systematic knowledge of intervention outcomes rather than unsubstantiated judgement" (Dunsmuir, Brown, Iyadurai and Monsen, 2009, p. 53). The growing body of knowledge linking neurological processes to behaviour is being advocated by many as a valid model for schools and teachers to employ (Dawson and Guare, 2004; Meltzer, 2010; Jensen, 2008). EFS in general and self-regulatory skills in particular are argued by many to be of central importance to the behaviour in the classroom of all learners, including those with childhood disorders (Ozonoff, Beth, Goodlin-Jones and Solomon, 2005; Ewing-Cobbs, Prasad, Landry, Kramer and DeLeon, 2004). Interventions aimed at developing these skills should be empirically tested. It follows that if such self-regulatory skills are to be improved, they can be achieved through a whole class intervention programme. Consideration is made as to the advantages of a whole class intervention approach, such as being cost effective and less time consuming through an adult working with a whole class and not an individual pupil.

In addition labeling concerns are by-passed as pupils are not seen as being in need of specific support.

1.11 Contribution to new knowledge

The present study contributes to new knowledge through undertaking a systematic investigation as to whether specific EFS, namely self-regulatory behaviour skills, can be improved in a mainstream class of year six primary children through an intervention programme. The rationale for the skills and the programme are influenced by cognitive neuropsychology. While many studies have been undertaken on children with emotional, social and behavioural difficulties, this study uses a universal programme in a main stream setting. Of added significance is the fact that this study is essentially a systematic investigation into the validity and efficacy of a cognitive neuropsychology based intervention.

1.12 Summary

The current study is essentially an investigation into whether or not classroom behaviour can be improved through a whole class intervention programme based on cognitive neuropsychology. This approach providing a theoretical model of behaviour skills relevant to classroom behaviour will enable schools to make informed decisions as to whether the link between brain research and behaviour in children and young people is sufficiently developed to be of value. This study also aims to provide insight into the role of educational psychologists as research practitioners, thereby enabling them to provide universal behaviour management programmes. It follows a positivistic methodology, adhering to the value of a scientific approach that aims to provide information that could apply to different situations.

For practising EPs, this research will strengthen the importance of providing teachers with evidence-based research. The demand for evidence-based practice has already influenced psychologists in the health profession and can only strengthen the role of educational psychologists in a constantly changing educational world.

1.13 Outline of the forthcoming chapters

Following this introduction, chapter two provides a review of the literature pertinent to the emergence and relationship educational psychology has to academic psychology and the

issue of whether psychology can be considered a science is addressed. Approaches to understanding school behaviour, the definitional problems and relevant government reports are considered and the manner in which educational psychologists have studied in-class behaviour, their theoretical models and their use of current brain based research is critically detailed. The chapter concludes with a consideration of how cognitive neuropsychology has generated models of behaviour that have relevance to classroom behaviours. The nature and role of EFS is explored with a focus on how self-regulatory behaviour skills are believed to be involved in both normal and pathological childhood development. The chapter concludes with specific testable hypotheses that are aimed at improving our understanding of classroom behaviour, and also investigates the validity of whether, at a whole class level, core behavioural self-regulatory skills can be developed.

Chapter three provides details of and justification for the use of a quantitative research design and includes a consideration of alternative epistemological positions. The need to establish the position adopted is of fundamental importance as it informs the methodology used, which in turn determines the research methods. The resultant evidence produced must be rigorous enough to inform educational practice. Importantly, this would enable any practitioner, wishing to replicate the study, to monitor and demonstrate the effectiveness of the interventions under different conditions.

The information provided in chapter four describes the methodology used to conduct the study. School and participant selection and recruitment are detailed as well as ethical considerations. Details of the intervention programme, procedures for its implementation, including data collection and statistical analysis are presented.

Chapter five presents the data which emerges from the research findings. The statistical analysis, both descriptive and inferential, of key data, with respect to the two research hypotheses are considered. Limitations of the study are examined and the issue of universal or targeted interventions fully explored. A current government led initiative is presented on account of it having implications as to how behaviour is to be viewed by schools. The chapter concludes with implications for practising EPs, the value of the study and suggestions for further research.

The sixth and final chapter begins with a summary of the main findings of the study and an interpretation of the results. This is followed by a critical examination of the methodology, its strengths and weaknesses, used to test the hypotheses. The chapter concludes with a discussion of the implication of the results with respect to practising educational psychologists, approaches to managing behaviour in schools as well as wider government and social implications. Opportunities for future research linked to this study are identified.

References and appendices can be found appended.

CHAPTER 2: LITERATURE REVIEW

This chapter reviews the literature apposite to the present research study. The works examined initially concern the relationship educational psychology has with psychology before providing an overview of information relating to behaviour in schools. An exploration of works on cognitive neuropsychology and how it informs the main research question concludes this review. It is organised into three sections which address the following:

historical background to the study of children and the emergence of educational psychology;
approaches to school behaviour;
cognitive neuropsychology and neuroscience.

A summary of the literature review and the key research aim of the study are presented at the end of the chapter.

A search for literature was conducted through key search databases including Psycinfo, Psycarticles, British Education Index, EbscoHost, using a range of key terms such as, educational psychology, cognitive neuropsychology, executive functioning skills, school behaviour, behavioural difficulties and classroom behaviour management. The following journals are also included in the literature review: *Educational Psychology in Practice* (EPiP); *Educational and Child Psychology* (ECP) and *Emotional and Behavioural Difficulties*.

Any scientific investigation needs parameters, and this is especially true for one concerned with school and classroom behaviour. The start date for the search concerning the two research journals is the date of the Salamanca Statement (1994) which advocated that all children, including those with additional needs, had the right to be taught in mainstream education. However, research and reports on behaviour published previous to this date published in other journals are included to provide a comprehensive view into behavioural issues pertinent to this study.

2.1 Historical background to the study of children and the emergence of educational psychology

This section examines the historical roots of educational psychology and the debate as to how psychological is educational psychology. A model that justifies educational psychology being regarded as scientific is presented, which will justify the research method this study adopts. Key journals which publish research carried out by practising EPs will also contribute to this review.

In the nineteenth century concerns were growing regarding children on several accounts. Firstly there was a need for children to be literate and numerate to enable them to join an industrial as opposed to agrarian workforce, and secondly, there was a growing alarm over the gap between the prosperity of some and the “persistent poverty, ignorance and vice of the urban proletariat” (Pick, 1989).

The introduction of compulsory elementary education in 1870 increased the interest and attention given to child development. As a result the Child Study movement emerged towards the end of the nineteenth century. It grew out of the growing public concern about the health and efficiency of the British population (Wooldrige, 2006). This movement provided information on children and their education. However, the need for a more systematic understanding of child development resulted in the establishment of two more formal organisations, namely the Childhood Society, formed in 1896 and dedicated to “the scientific study of the mental and physical conditions of children” (Wooldrige, 2006, p. 30) and the Child Study Association.

Both organisations were made up of contributors from such diverse professions as doctors, psychologists, biologists, educationalists along with parents. Most of its members were teachers, keen for “directions in our work” (Wooldrige, 2006, p. 37) and psychologists who were expected to be the experts in child development and to provide answers. After a period of being two distinct organisations, not without friction, the two finally merged in 1907 to form the Child Study Society which was interested in children’s mental development, with a focus on the quality of the school population. It inspected schools to determine how many children suffered from either physical, mental or moral difficulties.

However, it had many critics, Munsterberg (1898, as cited in Wooldridge, 1994, p. 44) argued that it was made up of “partly nothing at all, but decidedly not psychology.” Burt (1963, *ibid*, p. 45) considered the approach used by many in the movement to be essentially anecdotal and semi-sentimental. The movement, after a long period of decline, falling members, the incompatibility of harmonising amateur and professional views of child development, finally ceased to exist in 1946.

The movement had, though, attracted many influential allies, including Piaget and Freud, and made significant contributions, arguing, for example, for a higher school leaving age, thereby removing adolescents from the work place.

By the turn of the last century, psychology was becoming the discipline that studied, amongst other areas, the development of children. It now advocated that knowledge was to be based on a rigorous scientific method of investigation. The zeitgeist was right for the emergence of a more formal and professional organisation, and one that focused on children and young people in a school context.

2.1.1 British Psychological Society.

In 1901 the British Psychological Society (initially known as the Psychological Society), was founded and in 1901 the British Journal of Psychology was published. Its expressed aim is to “promote excellence and ethical practice in the science, education and practical application of psychology” (British Psychological Society, 2013). In the 1930s the British Journal of Educational Psychology was established. The rationale for a separate branch within the British Psychological Society emerged for numerous reasons. Firstly the growing need for children with learning disabilities to be professionally assessed and supported. Secondly the new discipline was seen as essential for teacher training courses, and its contribution needed to be based on objective research. Many in the progressive school movement embraced psychological theory and practice (Wooldridge, 2006). In 1965 the UK Division of Educational Psychology was established. Today it has over 2500 members. It is concerned with educational and child psychology in the broadest sense. A core aim is to assist schools and colleges to become more inclusive.

The challenge of including children with behavioural difficulties is reflected in the articles it publishes concerning this issue (Educational and Child Psychology, 2005).

Today there are two work-related areas where psychological knowledge is applied. These are in departments of education in universities and in advisory and support work in LEA and independent support services. The latter is mainly fulfilled by educational psychologists.

2.1.2 Educational psychology and psychology

To decide whether educational psychology is psychological it is first necessary to consider what psychology is: whether it is to be considered amongst the natural sciences or within the field of humanities. For many, such a debate, that was thought to have finished, has re-emerged within psychology and educational psychology (Thomson and Anderson, 2011).

As stated above, organisations interested in children's development were emerging in the late nineteenth century. At the same time, psychology was beginning to establish itself in universities in both the USA and Europe. The first experimental psychological laboratory in Europe was established by Wundt in Leipzig in 1879 and in America by William James at Harvard in 1875. The fact that both chose and had a commitment to use an experimental methodology shows an immediate bias towards psychology being considered a science. Agreement on a definition of psychology proved difficult, then and now. If it is to be defined by its major method, then "it is the scientific study of mental life and behaviour" (Gross, 2010). However, as will be discussed in the design of this study, there are different ways of obtaining information. The method chosen is often determined by the type of question/s being asked.

From the eighteenth century British empiricism influenced the type of knowledge that academic psychologists aspired to (Minton, 2012). That is knowledge that was based on the findings made from publicly observable events and obtained through the senses -unlike Freudians, who believed, that events such as dreams could provide valid information. Freud believed that dreams were the "royal road to the unconscious". Such private and subjective data could never be relied upon to inform general principles for a hard-headed empiricist.

If EPs are to investigate problems and challenges faced by learners, they need to be competent researchers. Whether the data they obtain is qualitative or quantitative, they should be competent and “ carry out the type of research demanded of the questions being asked” (Sweller and Rubie-Davies, 2011, as cited in Rubie-Davies, 2011, p. 268). This study makes the case confidently for a quantitative, scientific methodology.

While educational psychology naturally has its roots in its namesake, some take the view that EPs have lost their psychology. Norwich (2005) suggests that concepts are applied to develop interventions with their theoretical roots either being ignored or not known.

Clearly any advice given by practising EPs can be expected to reflect psychological knowledge. This knowledge is then applied to support learners in attaining educational success (Norwich, 2000). The view accepted in this research is that EPs apply a clear rationale for their activities which is based in sound psychological theory and evidence-based research and adheres to the professional guidelines as set out by the Division of Educational and Child Psychology (2002).

Webster and Hoyle (2000) see EP’s:

....understanding a great deal about cognitive, social and emotional development and the different patterns which these may assume according to the interactive dynamics of individuals in contrasting environments. (P. 95).

Key users of EPs in schools are Special Educational Need Coordinators (SENCOs), who are reported to highly value the ‘specialist knowledge of psychology’ that educational psychologists possess (Ashton and Roberts, 2006).

However, controversy and debate continue in this area. Since his influential text, *Reconstructing Educational Psychology* Gillham (1978) who argued that EPs were confused about their role, the true nature of the EPs role has continued to be commented upon (Boyle and Lauchlan, 2009; Ashton and Roberts, 2006 and Fallon, Woods and Rooney, 2010).

Cameron (2006) succinctly summed up the role of educational psychologists as follows,

....applied psychologists are required to use psychology in a creative and innovative way, so as to provide an integrated and coherent perspective of complex environments (eg. school, homes, children’s homes, etc), the complex problems and situations which occur in such environments (e.g. critical incidents, parental uncertainty, teacher stress, children’s learning and behavioural difficulties, etc) and

the complex needs of people which result from such problems (e.g., reassurance, insight, skill deficits, challenges to current belief systems, etc). (P. 292).

He believes there are five key dimensions that make educational psychologists' advice psychological:

- 1 adopting a psychological perspective to human problems
- 2 uncovering mediating/psychological variables which link particular situations with specific outcomes
- 3 employing psychological knowledge to create explanatory models of complex human problems
- 4 using evidence-based strategies for change
- 5 sharing and promoting big ideas from psychology

This study holds especially that point 4 is fundamental if psychology, as employed by EPs, is to be of value in assisting schools to manage classroom behaviour. Often teachers have been encouraged to use marketed classroom resources that make claims to their effectiveness that lack an evidence base (Kratzig and Arbuthnott, 2006).

2.2 Practising psychologists, classroom behaviour, research and publications

Practising EPs in the United Kingdom have two main journals where projects and issues are reported. This literature review is concerned with the two associations that represent and support practising educational psychologists in the UK. Both journals publish research articles and reviews relevant to the aims of educational psychology. A brief account of each journal is presented below.

2.2.1 British Psychological Society (BPS)

Under the auspices of the British Psychological Society (BPS) the Division of Educational Psychology has as a central aim to represent and promote the application of psychology to improve the well-being and development of schools, children and young people (DECP, 2002). The journal for this division is *Educational and Child Psychology*, which publishes papers aimed at increasing awareness of issues relating to educational and child psychology. Each issue consists of publications of relevance to practising educational psychologists.

2.2.2 Association of Educational Psychologists (AEP)

The AEP was established in 1962 and is the trade union and professional association for Educational Psychologists in the United Kingdom. Of interest to this review was the journal published by the AEP, Educational Psychology in Practice (EPiP). This journal reflects the theory, research and practice of UK educational psychologists. The journal articles are peer reviewed and complements those journals which focus on the experimental work of academic psychologists.

Both journals, namely Educational and Child Psychology and Educational Psychology in Practice will be reviewed with respect to relevant articles that relate to the EFS in the classroom.

2.3 Approaches to school behaviour

As the main focus of this study relates to classroom behaviour, the next section details how school and specifically, classroom behaviour have been shaped by different government led initiatives. How such reports have implications that add justification for the study being undertaken is considered. The role of the class teacher in classroom behaviour management as well as the contribution made by EPs to the study of classroom behaviour are also investigated.

Understanding school behaviour has proved problematical to both academics and practitioners. Over-time key government-sponsored reports have reflected changes in attitudes towards in-school behaviour. A consideration of such changes will be necessary before the role of teachers and EPs in classroom behaviour can be explored.

2.3.1 Individual versus whole school

Research into behaviour in schools has followed two contrasting pathways. Initially the dominant approach was to investigate the behaviour of individuals who displayed inappropriate/unwanted behaviours in the classroom. For example in the 1980's, a key manual for educational psychologists was Herbert's, Behavioural Treatment of Problem Children (1981). There continues to be no shortage of resources aimed at understanding and managing the behaviour of individual learners with problematic behaviours (Hampson 2010;

Crimmins, Smith and Bailey, 2007; Waterman and Walker, 2009; Varma, 1996). The focus has been and to a degree still is on the individual. Behaviour plans were consequently person centred (Carr, McConnachie, Carloson, Kemp and Smith, 1994).

An alternative approach emphasised the school as a system and examined the role of a school's behaviour policy. It was accepted that while individual teachers may have slight variations in the behaviours they consider necessary in their class, it was preferable if classroom behaviours were based on a school's behaviour policy (Reynolds, 1992; Muijs & Reynolds, 2011). Whole school behaviour policies proposed that schools developed structures and procedures that were evidence based and addressed the learning and behavioural needs of all students.

The systems approach reflects a shift in beliefs concerning schools and behaviour. Namely moving the focus from the individual to the context. The approach that advocated supporting the individual results in finding, as Dinkmeyer, and Carlson (2006) expressed it, the "weaknesses and liabilities" of learners. They argue that schools have a "failure-orientated evaluation system and a mistake-centred approach to instruction" (p. 31). The school systems approach examines what the school can do to meet the needs of all its learners. This will include those with challenging behaviours. Instead of being concerned with an individual's behavioural difficulties, this approach aims at creating learning environments that encourage the necessary behaviours in all learners. School behaviour policies thus become all the more significant in the management of pupil behaviour. The new mantra became 'prevention'. An effective school policy has prevention at its core (Algozzine, Horner, Sugai, Barrett, Dickey, Eber and Tobin, 2010) which was also a key recommendation of the Elton Report (DES,1989). Elton argued that effective schools do not put behavioural problems right afterwards, a reactive approach, but instead proactively encouraged students to behave appropriately. Both approaches have validity and supporters.

Educational psychologists have for many years laid stress on the learning environment and the systems within it. This can be seen in part as a move away from an individually orientated, deficit approach to failure. As long ago as the 1930s J. B. Watson, the father of Behaviourism, stressed the environment in his famous pronouncement that if given a dozen healthy infants he could make them what he wanted. "Doctor, lawyer, artist, merchant-chief

and, yes, even beggar-man and thief” (Learning and Teaching, 2013). This approach has been supported by government-led initiatives to focus on improving the school context, rather than exclusively focusing on the individual.

“In addition to working with individual children, the educational psychologist can work with groups of pupils and teachers and learning support assistants at the classroom or whole school level, for example helping to develop knowledge and skills for school staff and assisting with projects to raise achievement and promote inclusion” (DfES, 2001a, section 10.8).

The systems model is essentially an ecological approach and incorporates the core argument put forward by Lewin (1936), namely that behaviour is a function of the relationship between the individual and the context. To understand a person’s present behaviour necessitates an understanding of the context he/she is in. Bronfrenbrenner (1979) challenges those who believed the explanation for a person’s present behaviour could only be found in a person’s past, not present.

Attempts to improve classroom behaviour can be expected to be most effective if they are based on an understanding of the interaction between the individual and their context. A coherent model reflecting this approach was developed by Daniels and Williams (2000). Their *‘Framework for Intervention’* imaginatively referred the ‘problem behaviour’ for analysis and support, not the learner. Their approach being summed up by, ‘the problem is the problem, not the child’. Their model looked at the level of work being presented to the student and other contextual factors that could contribute to the observed problematic behaviour.

It is not difficult to see a tension for EPs caused through these contrasted positions. While the aim to promote inclusion is a widely supported ideal for some there is an increasing imbalance between the role of educational psychologists as diagnosticians and that of system analysers, especially as many schools saw the EP role as that of the ‘expert’ who could diagnose ‘within’ child factors that could explain any problems or discrepancies in learning or behavior (Imich, 1999; Leadbetter, 2000; Gersch, 2009).

2.4 Definitions of behaviour and behavioural difficulties

Given that this study is concerned with in-class behaviour, it is necessary to consider how “behaviour” has been conceptualised, both historically and currently. Defining school behaviour is no easy matter. The answer to such questions as, when does behaviour become misbehaviour, and when is misbehaviour considered problematic behaviour, remains elusive. This sentiment is captured by Visser (2003) who wrote of chronic definition difficulties for EBD. Academics, school leaders, governments all have different views. Lewis Carroll in *Alice in Wonderland* encapsulated this dilemma as follows, "When I use a word," Humpty Dumpty said, in a rather scornful tone, "it means just what I choose it to mean - neither more nor less". This seems to sum up the dilemma, namely behaviour is defined differently by different people. One person's problematic behaviour is another's, naughty behavior. It seems that “deviance is in the eye of the beholder”. Different groups are likely to differ as to how they define behavioural difficulties on account of the values and theories that they hold (Hayes, 2003). Individuals will usually make sense of their own behavior as a result of environmental factors, whilst observers, from of course their own individual standpoint cannot see the environmental influences on another person's behavior. As a result there is an attribution bias to see the behavior as being the result of enduring characteristics of the person being observed (Forsterling, 2011).

The commonly used educational term in the UK to refer to students with some degree of behavioural difficulties is SEBD (Social, Emotional and Behavioural Difficulties). Though initially it was only EBD, the Social being added later (Cole, Daniels and Visser, 2013). This addition in itself reflects a change from focusing the problem exclusively within the child to a broader view that accepted that social/environmental factors influence behaviour in significant ways. As Bronfenbrenner (1979) so clearly detailed in his ecological model, behaviour can be only fully understood if reference is made to the systems, protocols and practices of the macro system in which the observed behaviour is a feature.

Nonetheless SEBD remains a highly obfuscated concept. Any words we use to describe behaviour, is a linguistic description for the actual behaviour itself. Such a description will have boundaries and normative parameters that operate in any particular social system. So whether any behaviour is judged as ‘good’, or ‘bad’, will depend on such factors. As

Angelides (2000) says, “behaviour must be studied in relation to the specific organisational context.” So while pupils and school staff are unique individuals, they operate as integral parts of a social system which shapes their interpretations of behaviours as well as how they choose to behave. Consequently, for e.g. obscene language may be considered abhorrent in one school but not considered severe enough to warrant intervention in another. Whether a behaviour is labelled ‘pathological’ will depend on the ethos of the school and the classroom (Jones, 2003).

Clearly, all involved with behaviour in schools are faced with a complex problem. There are problematical behaviours that are displayed by many students. These behaviours are typically managed effectively by many teachers with good classroom management skills. But there are also students who exhibit similar, but more extreme and persistent behaviours. These require additional in school support. There is then considerable overlap, on account of the many intervening variables involved, such as the age of the child, the nature of the behaviour, the context where it occurs, the intentions behind the behaviour, family and medical factors as well as learning and communication issues. Elton (DES, 1989) found that most of the submissions his committee received from schools on behaviour agreed, “that bad behaviour in schools is a complex problem which does not lend itself to simple solutions” (p. 64). However some clarification can be found if the difficulty is viewed as one of classification.

Based on the individual model of behavioural difficulties, there are two dominant classification systems, each purporting to explain problematic behaviour (Cullinan, 2004).

Firstly, and of longest standing, is the disease or medical classification model. This model purports that children considered to have Social, Emotional and Behavioural Difficulties (SEBD) are qualitatively different from those who do not. That is they have a number of specific and identifiable maladaptive and distressing behaviours. A learner either has or doesn’t have SEBD. This approach is epitomised in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) of the American Psychiatric Association (2013). Which gives diagnostic criteria for a large (and burgeoning) number of discrete classifications.

Contrasting with this is the dimensional classification model. This approach asserts that SEBDs are extreme forms of ordinary behaviour. This view sees SEBD as a collection of

problems involving thoughts, feelings and behaviour. It is stated that all have these, but for some the problems are such that they will interfere with their everyday functioning.

The first approach seeks to establish an aetiology for the SEBD while the latter, is more an account of what is the norm, from a pragmatic viewpoint. While a generally agreed definition of SEBD remains elusive (Cole & Knowles, 2011) an answer to the question, “When does misbehaviour become SEBD?” is important for any research into school behaviour. The preferred definition for this research study is adapted from Emerson (1995), “when its frequency, duration and intensity are such that additional support is required for the learner to be successfully included” (p.4). This is supported by the DfE (1994b) which saw all behaviour as a question of degree, “Children with EBD are on a continuum. Their problems are clearer and greater than sporadic naughtiness or moodiness and yet not so great as to be classed as mental illness” (p. 4). To support consistency the general term, problematic behaviour will be employed to enable this thesis to undertake a comprehensive consideration of the many factors that contribute to any behaviour.

2.4.1 Intervention implications

Whichever approach to understanding problematic behaviour is adopted has intervention implications. The medical approach considers any SEBD in terms of pathology, and consequently the practitioner’s aim is to remove the problem. For example if a child has aggression as a symptom of his/her SEBD, the intervention aim would be to eliminate the aggressive behaviour. The dimensional approach sees the aggressive behaviour as being an extreme version of ordinarily expected behaviour patterns. The intervention would be to establish new ways of responding that would be more appropriate for the context. This is also referred to as a constructionist approach (Emerson & Einfeld, 2011; Cullen, Hattersley and Tennant, 1981; Goldiamond, 1974).

Accepting the dimensional approach to behaviour has important implications for this study. The behaviour of all mainstream primary school children can be seen as being situated on the same continuum. Behavioural differences are a matter of degree not quality. Interventions aimed at improving behaviour are therefore logically applicable and equally relevant to each and every learner, whether they are in a main- stream or special school. All are learning environments and concerned with supporting new learning and equipping learners with new

ways of being or engaging with the world.

Jones (2003) argues that EPs have become, fixers of problems, 'pragmatic eclectics'. Enabling learners to develop new skills to solve the problem of unwanted behaviour is a pragmatic solution. Consequently there may be no psychological perspectives involved to inform an EPs decision. Such an approach "risks complacency and uncritical acceptance of imported perspectives" (Jones, 2003, p. 154). A pragmatic approach with no theoretical underpinnings will only work on account of anecdotal evidence. As a consequence it is unlikely for any conclusions to be transferable to new situations. Furthermore if the approach does not work there is no psychological model or other learning base from which a new solution can be developed for the difficulty being faced.

2.5 Government reports into school behaviour

The important role that teachers fulfill in developing positive in-class behaviour has been stressed by several influential government sponsored reports. A brief review of key studies will clarify how behaviour has been conceptualised as well as supporting the need for this investigation.

A concern of past and present governments has been the issue of how schools, mainstream and special, successfully include learners with SEBD and how to improve the effective behaviour management of all learners. The road to our present educational system is the result of many inter-related factors, medical, educational, social and political. Significant changes have been codified in educational legislation. Of special relevance here is the link between classroom behaviour and the role of the teacher.

2.5.1 Education legislation

(1) 1981 Education Act

This Act, which was in response to the Warnock Report (1978) held that only some 2% of learners would have complex and life-long difficulties requiring additional support and receive a statement of their special educational needs. The majority would be integrated into mainstream provision. This Act set a challenge for mainstream schools, namely to manage and include all learners and successfully include those whose behaviour would previously have resulted in segregated provision.

From this time the frequency of reports on behaviour increases, schools were put under pressure to manage behaviour more effectively. Exclusion of learners on account of their behaviour became thought of as a last course of action.

(2) The Elton Report – Discipline in Schools (1989)

This report was undertaken as a result of media and public concern regarding behaviour in schools. It emphasised that, “reducing bad behaviour is a realistic aim. Eliminating it completely is not” (p. 65).

This study made a clear and forceful case for the role of teacher classroom management skills in managing behaviour. For Elton ‘classroom management ‘included a teacher’s subject knowledge, lesson delivery skills, and group management skills which included relationship skills as well as promoting positive behaviour and dealing calmly with disruptive behaviours.

The Elton Report gave rise to the following set of government circulars. These were entitled Pupils with Problems (1994) but became known popularly as the ‘six pack’:

(3) Pupil Behaviour and Discipline (8/94)

Education of Children with Emotional and Behavioural Difficulties (9/94)

Exclusions from School (10/94)

The Education by LEAs of Children otherwise than at School (11/94)

The Education of Sick Children (12/94)

The Education of Children being Looked After by local Authorities 13/94)

It is worth noting that the title of this set of circulars, Pupils with Problems, suggests that the problem behaviours are caused by problem pupils. Therefore the need is to ‘fix’ the pupil. This way of conceptualising the problem has echoes from the past, the medical model especially. Later legislation has reflected a wider debate, (Elton, 1989; DES, Steer Report, 2005) which includes improving behaviour through both school improvement and developing the necessary skills in those learners with problematic behaviour. The persistence of the medical model seems resistant to change (DFE, 2014) for example it is noticeable that the

recent code of practice (DfE, 2014) has a category of need entitled Social, emotional and mental health difficulties (P. 85) which seems to suggest that persistence of the medical model is resistant to change. A study of strategies to support pupils with EBD in a mainstream primary school noted that there was little evidence of a shift away from seeing emotional and behavioural difficulties as problems located within individuals, the so-called 'medical model' of EBD. (Evans, Harden, Thomas and Benefield, 2003). The study established a panel of professionals with an interest in determining effective interventions. Critically teachers, a group naturally interested in such research were not represented on this panel. In reality the findings reflect a publisher's bias in publishing work with a large effect, smaller studies, with statistical anomalies although relevant were not reported. Consequently a somewhat biased account is presented, though the predominance of interventions that reflect 'within' child deficits remains persistent.

(4) Learning Behaviour: The Report of the Practitioners' Group on School Behaviour and Discipline (DfES 2005), known as The Steer Report.

Key to its recommendations was the need for continuing professional development for teachers in classroom behaviour management skills. As concern was reported with regard to newly qualified teachers, the report recommended that, "The Training and Development Agency for Schools (TDA) should review how initial teacher training prepares teachers to manage pupil behaviour".

This report was again partly in response to growing concerns about disruptive student behaviour in schools. As with other reports it strengthened the early findings of the Elton Report (1989). It summarised the components for effective classroom management and made a strong and important link between behaviour and learning. Hitherto there had been a growing tendency for behaviour to be seen as something separate from learning. The Steer Report (2005) established this important link. This is reflected in the nomenclature often given to current behaviour management courses and resources, that is 'Behaviour for Learning' (Tod and Ellis, 2009). In the past such courses were more usually known as 'Positive Behaviour Management' (Cowley, 2014; Rogers 2013).

(5) The National Curriculum, which was introduced following the Education Reform Act (1988)

This was supported by the Code of Practice (DfE, 1994) which implicitly assumed that schools would develop some form of behaviour curriculum. This would in essence be the “working practices of a school’s behaviour policy” (Bates and Moss, 1997). Bates and Moss undertook a study which looked at the typical behaviours that teachers expected from children of different ages. The data was essentially qualitative in nature and found that teachers differed considerably in their behavioural expectations for children of different ages. Due to the qualitative methodology adopted, it may be difficult to generalize from this sample since the very method adopted led to open discursive responses which preclude simple categorization. Notwithstanding this they concluded that a hierarchical behavioural curriculum of the skills that need to be taught to children for positive in-class behaviour could be developed.

2.6 Social, Emotional Aspects of Learning (SEAL)

An influential attempt at a curriculum to address emotional and behavioural issues will now be considered.

After establishing materials for key subjects, the Key Stage 3 National strategies for behaviour and attendance were introduced (DfE, 2003). One development, at both primary and secondary level, was the production of materials to support the social, emotional aspects of learning (Department for Education and Skills, 2005; Department for Education and Skills, 2007). This was linked to the *Every Child Matters: Change for Children* agenda. Based on the DfES funded research by Weare and Gray (2003) the government endorsed the view that there was a need for schools to explicitly teach such core skills as self-awareness, managing feelings, motivation, empathy and social skills.

These have been encapsulated in the SEAL curriculum which is a whole-curriculum framework built through a child developmental model (Weare and Gray, 2003).

SEAL is described as ‘a comprehensive approach to promoting the social and emotional skills that underpin effective learning, positive behaviour, regular attendance, staff effectiveness and the emotional health and wellbeing of all who learn and work in schools’

(DfCSF, 2007, p. 4). In part, support for SEAL and other related programmes has been the result of concern over the increasing number of children with mental health issues (Green, McGinnity, Meltzer, Ford and Goodman, 2005). As long ago as 1995 Rutter and Smith reported how the increase in psychopathological disorders in children and young people could best be explained as a result of changes in society, which increased the at risk factors that children faced. The need for them to be taught the necessary skills and how to achieve this has become a high priority (Young Minds, 2014).

SEAL is an important example of an explicit curriculum that is to be taught to all learners and at a whole class level. It provides a curriculum for developing social, emotional and behavioural skills for all learners in both primary and secondary schools. Some of its components are similar those of concern in this study and therefore it justifies further examination.

SEAL is one of many initiatives that emerged since the popularisation of ‘emotional intelligence’ (Goleman, 1996) and ‘emotional learning’ (CASEL, 2007). The generic title, Social Emotional Learning (SEL) is often used to include both those not dissimilar areas. For some SEL is seen as an educational fad that lacks hard empirical support (Paul and Elder, 2007) while for others it is seen as a positive attempt to teach all learners essential life skills (Gresham and Elliot, 2008).

This thesis justifiably takes the position that the weight of evidence is on the side of the detractors of SEAL. As will be argued below SEAL lacks a strong theoretical underpinning from which interventions can be based and empirically tested. A problem for supporters of SEAL is the way in which many different features can appear in any curriculum that purports to be SEAL, though, in fairness, it was conceived as a flexible framework (Humphrey, 2013). Schools were encouraged to explore and design their own curriculum, one that would reflect any specific individual school priorities (Weare, 2010). This makes evaluation of the efficacy of SEAL extremely difficult. Advocates for SEAL claim significant impact on a range of in-school traits, such as pro-social behaviour and attitude towards school (Hallam, Rhamie, and Shaw, 2006). A survey of some 172 schools collecting data from all staff and children found that some 90% saw the programme as being “at least relatively successful”.

All responding head teachers, 87% of teachers and 96% of non-teaching staff agreed that the programme promoted the emotional well being of children, while 82% of teachers agreed that it increased pupils' ability to control emotions such as anger (Hallam, et al,2006).

Critical evaluation, consistency and peer review of SEAL is a serious problem. Using content analysis Petrides and Furnham (2001) found 15 aspects of social, emotional learning included in different programmes. These included adaptability, low impulsiveness, self-esteem, self-motivation, stress management, trait happiness, trait optimism, assertiveness, relationship skills, social competence, trait empathy, emotional expression, emotional management, emotional perception and emotional regulation. Anyone doubtful as to the usefulness of this approach in schools has justification for their skepticism. Such a broad and variable field of study makes any precise scientific evaluation problematical and consequently not open to rigorous investigation (Zeidner, Roberts & Matthews, 2002).

A review into the issues relating to SEAL and similar programmes concluded that:

FFFthere is no real “gold standard” measure of Social and Emotional Skills, and therefore the authors assert that further research and instrument development is needed in this area. Such work will not only aid educational psychologists wishing to accurately assess pupils' Social and Emotional Skills, but will also serve to deepen their understanding of the impact of social and emotional learning programmes. (Wigelsworth, Humphrey, Kalambouka and Lendrum. (2010, pp.183).

A more critical view of the same research suggests that there can be a tendency for, as Humphrey (2013) puts it, ‘confirmation bias’ suggesting that that the positive findings reported by Hallam (2006) are not in reality as favourable as reported. This is supported by the low response rate from users of SEAL claiming a positive impact on children's schoolwork, forty one per cent of teachers disagreeing that it had improved concentration, for example. However, SEAL was considered a more positive influence on playground behaviour rather than in-class behaviour (Humphrey, 2013). At best an analysis of the findings suggests that they are somewhat equivocal.

A key difficulty is that there have been few critical peer reviews of SEAL undertaken by practising EPs. One review into efforts made to measure children's emotional skills concluded that it was difficult to measure something that proponents themselves had

difficulties in defining (Wigelsworth, et al, 2010).

The value of teaching children social and emotional skills remains a controversial area. For some it will foster a better attachment to school and strengthen children's resilience (Humphrey, 2013), while others consider SEL to be too eclectic. Emotional skills cannot, claim its critics, be taught and being a good role model is the best teachers can do to encourage kindness and courtesy to others (Bennett, 2013). Such comments provoke long-standing SEAL supporters to defend the value and efficacy of SEAL all the more vigorously (Gross, 2013; Howard, 2013).

There are clear advantages to a universal preventative approach intended to develop a range of necessary behaviour linked skills. The costly need to assess all children to identify those 'at risk' is removed. The risk of stigmatising those children identified as being in need is reduced and there is less need for highly trained and expensive professionals to deliver more complicated targeted programmes.

This consideration of SEAL has highlighted the need for empirically researched school based initiatives to be rigorously studied to justify the considerable amount of time and money that they can entail. Where evidence exists, SEAL programmes have been found to not achieve set objectives (Humphrey, 2013).

SEAL can be commended as a positive initiative, whilst its detractors can highlight its serious weaknesses, namely a lack of empirically validating evidence. It is worth noting a recent review of SEAL by Humphrey, Lendrum and Wigelsworth, (2013) thought that SEAL initiatives could be improved if research was used to inform the programme design from the beginning. They also highlighted the need for those who implemented the programmes to be better trained and fully aware of the importance of implementation quality.

Much of the research into school behaviour has been motivated and influenced by government driven initiatives as well as social commentators who look for stories that will sell newspapers and/or attract viewers. Investigations have been more often undertaken by experienced practitioners rather than critical or skeptical scientifically orientated researchers.

As a result the outcome is often a number of pragmatic guidelines that aim to satisfy the needs of disparate groups who have vested interests. These will include teachers, parents, interested professional groups such as the health services, and the media.

American Secretary of Education, Margaret Spellings (2008) pointed out in a debate on closing the achievement gap and increasing success for all learners that “we can’t adequately solve this problem until we diagnose what’s wrong” (Spellings in Higgins and Dawsey, 2008, P. 1). Reports on behaviour masquerade as explanations for the problem when in fact, they are only offering descriptions of the problem. It is important to stress that how behaviour is conceptualised has changed considerably.

To consider the current position as some kind of end point, would be naive. The above reviews government reports and initiatives to date. Schools have long been under pressure to accommodate different governments’ educational philosophy, and such is likely to continue.

2.7 Classroom behaviour and teachers

The role of the class teacher in managing pupil behaviour will now be considered. Evidence suggests that a pupil’s behaviour can vary depending on who he/she is taught by (Martin and Carroll, 2005). This is reinforced by Visser (2000) who observed that:

When teachers do not successfully manage behaviour in classrooms then the emotional and behavioural difficulties experienced by pupils may be exasperated to the point where both they and their teachers feel they can no longer cope and alternative provision is required. (P. 1).

Furthermore a study involving the reintegration of pupils considered to have EBD further reinforces this view. Swinson, Woof and Melling, (2003) found that the behaviour of twelve pupils from an EBD school when integrated into a mainstream school depended on the management skills of the class teacher. The pupils were well behaved in well-run lessons, but their behaviour deteriorated in less well-organised ones.

Teachers naturally need to have techniques to respond to challenging behavior. However, the research of Kounin (1977) suggests that the search for more and more strategies to deal with problem behaviours is not in itself the answer. Managing class behaviour is more than a matter of acquiring more and more techniques. In fact, if the emphasis is placed on how to

respond to problematic behaviour then, “teachers will continue to experience failure and frustration” (Maag, 2001, p. 182). There is a serious danger that if schools pursue the reactive approach to control behaviour, then learners with problematic behaviours are more likely to be excluded from school, drop out and become involved in antisocial life styles (Sugai, Horner and Gresham, 2002). As shown, a common observation, including government reports (Elton (1989), Steer (2005) and practitioners (Cole and Knowles, 2011) is the important role of the class teacher in managing behavior. Resources aimed at improving teachers behaviour management skills of their classrooms is extensive (Bryson, 2004; DiGiulio, 2000; Robertson,1989; Visser, 2000; Martin, Sugarman & McNamara, 2000; Hopkins, 2000; Arthur-Kelly, Lyons, Butterfield and Gordon, 2007; Rogers, 2000; Marzano, 2003; Hrekwow & Howard, 2014).

However, a balanced conclusion with regard to a teacher’s role is that classroom behaviour management skills are necessary, but not sufficient, a position held by Ofsted (2005). Ofsted suggested the need for regular teacher training which was focused on classroom practice. In addition, to understand and manage behaviour teachers needed to have an in-depth appreciation of child and adolescent development. The following quote summarises very clearly the importance of a teacher’s skills in managing classroom behaviour.

Effective and ineffective teachers do not differ in terms of how they respond to misbehaviour but in terms of their ability to maintain student engagement in academic tasks and prevent problem behaviours from occurring. (Rathvon, 2008, p. 73).

This appears to be the position the discourse has arrived at with several commissioned government reports supporting this view (The Elton, 1989; The Steer report, 2005). The rationale for this attitude would seem to be that problematic behavior persists despite a myriad of behavior management techniques that have been taught to teachers. However a counter explanation is that societal changes combined, especially with the natural changes that occur during adolescence has made behaviour resistant to change. Adolescents are getting younger while adolescence is taking longer (Laser and Nicotera, 2011). Many adolescents are in ambiguous situations wishing to break away from the micro-social mores of their family and take up a more individual stance in a world that is changing rapidly. In addition this period is fuelled with hormonal changes, problematic behaviour in some form is

to be expected (Feinstein,2004).

2.8 Salamanca statement (1994)

The inclusion of all children, including those with additional needs into mainstream schools was advanced through a declaration made in Spain, between numerous governments. This became known as the Salamanca Statement. Some 92 governments, including the United Kingdom, signed a commitment to strengthen the right that:

....those with special educational needs must have access to regular schools which should accommodate them within a child-centred pedagogy capable of meeting these needs. (Salamanca, 1994).

For many governments this was interpreted as meaning the right of all children to regular mainstream schooling. This statement added impetus for the inclusion of those children with problematical behaviours. Naturally it was of special relevance to all those who support schools in achieving this goal, including educational psychologists who have a significant contribution to make in achieving such a goal.

The review will now consider the investigation of classroom behaviour by practising EPs. It will have as a parameter of considering work published by practising UK EPs from the date of the Salamanca Statement (1994).

2.9 Classroom behaviour management, educational psychology and neuroscience

Have practising EPs researched classroom behaviour management? There is a body of thought that asserts significant doubts as to the contribution likely to be found concerning behaviour research undertaken by EPs working in the British context. In a comprehensive literature review undertaken to inform a report by Ofsted (2005) concerning how schools and colleges understand challenging behaviour Visser (2003) who has written extensively on behavioural issues, made the following observation, “reference is rarely made to British academic psychological journals: this is because little of relevance was found in issues of these dating back to 1994.” (P. 9).

Coincidentally, the date referred to is the same as the time parameter set for this literature review.

With an apparent emphasis on ecological approaches to behaviour, it is to be expected that

whole classroom behaviour management will have received considerable attention by practising psychologists. McKee and Witt, (1990, as cited in Gutkin & Reynolds, 1990) suggest that this is not the case.

....there exists in school psychology a lack of congruence between, on the one hand, our data-based assumptions and beliefs concerning the importance of the environment and, on the other hand, our practice where environmental variables are seldom seriously considered for the purpose of designing interventions. (P. 209).

To ascertain the veracity of these views, the publications in the key EP journals that are clearly focussed on whole classroom behaviour management were considered.

Firstly it was important to consider the theoretical models of behaviour that inform EPs.

2.9.1 Educational psychologists and theoretical models

EPs are frequently called on to give advice to teachers on account of a student's problematical behaviour. The behaviour may be a barrier to the individual learning, other students learning or the teacher teaching. It can equally include all three. In the past, advice from educational psychologists was heavily biased towards "behavioural psychology". Miller (1989) found that of a random sample of educational psychology services, between 50% and 86% of the psychologists used behavioural approaches. However, while behavioural interventions remain popular, other psychological models are clearly in evidence. Hart (2010) found that EPs were employing theoretical models based on attachment theory as well as humanistic/child-centred ones. Hart concluded that EPs are developing a multi-dimensional model, one that is eco-systemic. Behavioural approaches remain of value (Sugai et al.; Watson and Steege, 2003), but there are EPs who are employing alternative and equally effective ways of supporting classroom behaviour. It would seem that different psychological models to explain difficulties can inform the use of similar interventions. For example clear and consistent boundaries can be considered a behaviourist intervention or equally may be based on attachment theory and the need the child may have for safe boundaries.

2.9.1.1 Individual case work versus whole class work

The present study is concerned with developing and improving the classroom behaviours of all learners, believing that it can be a more effective and time saving approach. But it does

conflict with the typical individual case study method, typically associated with EP work. A professional tension may seem to be present here. Many teachers prefer EPs to see individual children to advise and assist with their difficulties. For some EPs it would be folly for EPs to move too far from case work (Boyle and Lauchian, 2009).

The two approaches are not, however, mutually exclusive as the following evidence shows. When the advice is given for the individual the lament is often, “But what about the others”. Interestingly though, a study by Miller (1996) found that a case study approach far from having a negative effect on other pupils in a class, produced a definite benefit. The same issue was studied, with similar results, by Presland (1978) who found that the behaviour modification techniques he recommended for individual children were being applied by teachers to others in the same class, demonstrating that individual case work can have benefits to other learners.

Whilst there is clearly an argument for whole class based work, it is clear from the research of, for example Miller and Presland, that individual work can lead to wider changes at a whole class level. Given the range of difficulties that some children face, individual complex case work is an important issue and may be a necessary focus for EP work as asserted by, for example by Curran, Gerch and Wolfendale (2003) and also Boyle and Lauchlan (2009). The latter forcefully arguing that individual casework can both inform systemic work and also help maintain the credibility of EPs in the education market place.

Studies that have considered classroom behaviour management from 1994 are mainly concerned with a teacher’s approach to behaviour management, how they use rewards and sanctions as well as communication techniques (Mahony, 2003). From this time, as part of their support role, many EPs were running In-Service Training (INSET) on behaviour for schools. These were often aimed at involving schools in reviewing their own existing behaviour policy and classroom practices (Willis, 1994). An assumption, supported by the Elton Report (1989), was that “disruption could be alleviated by helping teachers to become more effective classroom managers” (p. 150). The INSET delivered was not concerned with individual learners with behavioural difficulties but with whole class behavioural strategies. This was an example of the practical support EPs were providing to schools to improve the management of classroom behaviour. It reflects a commitment to the school effectiveness

approach, that schools and classroom teachers could become more effective managers of behaviour. It also reflects a pragmatic approach, with little psychological input as to why certain approaches work. Many school psychologists were trained to deliver Canter's Assertive Discipline programme. (Canter, 1992; Cameron, 1998; Nicholls and Houghton, 2011)

However, such training cannot be considered as evidence based practice as it lacked critical evaluation as to how effective such training was or what changes were achieved. This is because, as Shavelson and Towne ((2002) argue, the effectiveness of the training was not rigorously and objectively established. Others have used behavioural psychology more explicitly. Hayes, Hindle and Withington (2007) who, while accepting behavioural psychology's limitations, hold that it is still effective. They embedded theory and practice into a 'systematic problem-solving process based on generic behaviour management principles' (p. 164).

2.9.1.2 Teaching behavioural skills

Classroom studies often focused on the effectiveness of teacher feedback in modifying behaviour (Stage and Quiroz, 1997; Hughes, Cavell and Willson, 2001), some giving more detail of the principles that underlie the effectiveness of behavioural psychology (Swinson and Knight, 2007; Swinson and Harrop, 2001). Studies have also used social skill training as a way of improving in-school behaviour. While examples of whole class interventions are scarce, it has proved effective with small groups. Denham, Hatfield, Smethurst, Tan and Tribe (2006) found that social skill training positively helped primary pupils who were at risk of being excluded. They found, "significant positive change did take place in the current study with very needy and challenging children". The study compared the effectiveness of two types of interventions for 'at risk' pupils. One group received social skill training (N = 35) and another peer mentoring group (N = 33). However no control group was used to increase the robustness of the findings. This was on account of the ethical issue that a potentially beneficial intervention would be denied to a group. Enabling a control group access to the interventions subsequent to the study could have removed this as an issue.

Studies that explore how teachers could teach learners the necessary skills needed to behave appropriately in class are less common The need to develop teacher's behaviour management

skills, a recommendation of many reports has been heeded. The better skilled teachers are in managing pupil behavior the more effectively they can improve pupil's social skills (Hughes, Cavell and Willson, 2001; Evertson and Weinstein, 2006). Developing the necessary skills in learners has received less attention. Where it has been considered it is predominantly based on behavioural psychology (Moreno, 2010). An understanding of how environmental contingencies affect behaviour continues to be of indisputable value. However, our increased understanding of brain maturation has given rise to new models relevant to classroom management: 'we do much better for some children in recognising the biological bases of their behaviour' (Frith, 2011). The usefulness of such models needs to be researched.

This review will now consider how neuropsychology can further our understanding of classroom behaviour. Neuropsychological research has found that learners vary in the degree of competency in core skills that will affect their in-class behaviour. Denckla (1989) refers to children who do not have 'Learning Disabilities', but instead, 'Producing Disabilities.' The problem is not in their ability to learn new information, but instead, in their ability to control their own behaviour, such as time management and planning. Her theoretical account seeks to explain the mismatch teachers often observe. That is the pupil who can communicate effectively, read and is numerate, yet struggles when asked to demonstrate what he or she has learned. For Denckla such students are at risk of failing on account of their poorly developed EFS.

Neuropsychological research would suggest therefore that problematic behaviours can exist in a class on account of learners having poorly developed EFS. This would be irrespective of the teacher's classroom management skills. It follows that in such circumstances the solution is for the teacher to teach the pupils the necessary EFS.

2.10 Cognitive neuropsychology

The final section of this literature review, examines research on cognitive neuropsychology and makes the argument that this work can take a central place when devising whole class interventions. Cognitive neuropsychology has localised, within the brain, key processes that regulate behaviour, construed as EFS. An understanding of the maturation of these skills, their association with typical development, childhood disorders and gender is explored. This is followed by a review of the role of EFS in classroom behaviour and a further justification

for the study undertaken to be presented. This study is concerned with how neuropsychological models of brain maturation can inform and underpin cognitive learning theories. Based on such empirically based information, theoretical psychological models have been constructed to explain the necessary skills required for learner's classroom behaviours, which will allow for the development and trailing of targeted interventions for learners.

The review will also consider the extent to which EPs have studied EFS, given their role in supporting teachers to include children with a range of problematic behaviours.

Advanced research techniques in neuroscience have opened the way for new models, based on brain research, to explain behaviour. The 'black box' has finally been opened. There now exists high interest in the potential for neuroscience to inform and enhance educational practices (Pickering and Howard-Jones, 2007). The application of it and its relevance to children's behaviour in the classroom is especially pertinent.

2.10.1 Cognitive neuropsychology and neuroscience

All human functioning is essentially neurological in nature. Its roots are in electrical biochemical events within the nervous system (McAtee, 1999). Neuroscience is the understanding of the human brain through the development of new scientific methods. Our understanding of how the brain functions has come a long way since nineteenth century phrenology. Historically, neuroscience was a sub discipline of human physiology and medicine. Today, it is both a distinct science in its own right, as well as a sub-discipline in other sciences. While neuroscience has as its core aim the understanding of the brain, a related aim, influenced by its links to medicine, is to heal the brain when it is damaged (Taylor, 2012).

A brief account of the procedures that have been developed to study the human brain will show how the link between the brain and behavioural self-regulatory skills has been established.

At first the brain was understood anatomically through autopsies. However, the discovery that neurotransmitters were electrically charged (Thompson, 2000) led to the development of

the electroencephalograph (EEG). This involved recording electrical activity through the scalp. The electric potential of a single neuron is far too small to be measured. However, when many fire simultaneously, referred to as synchronous activity, the EEG, can record brain activity through using a voltmeter. This was of particular value for medical practitioners studying epilepsy (Berger, 2006).

Further techniques were developed as understanding of the nature of neurons improved. Electrical activity produces magnetic fields. In the 1960s a new research tool the magneto-encephalograph (MEG), was developed. MEG has the advantage over EEG, in that magnetic fields are less distorted than electric fields. The latter can be distorted by the skull and the scalp, through which measurements are taken. MEG has contributed to research into perceptual and cognitive brain processes (Hansen, Kringelbach & Salmelin, 2010).

In the late 1950s, positron emission tomography-computed tomography (PET-CT) was developed, again to aid medical diagnoses. This enabled two sources of information to be combined. Computerised Tomography, (commonly known as the CAT scan), used X rays to locate specific detectors with in the brain. The PET looks at activity through detecting radioactive glucose, which is injected into the patient. An example of where this work has been extremely useful has been in the study and identification of cancer cells. All cells use glucose as an energy source, cancerous cells grow faster than healthy cells and use more glucose. The significance of this was that together both techniques have advanced oncological research and treatments.

Today, the dominant technique, which has especially contributed to research in neuropsychology, is functional magnetic resonance imaging (fMRI). This method measures brain activity indirectly through detecting changes in blood flow. An increase in blood flow is indicative of neuronal activity (Anderson & Gore, 1997). The MRI uses changes in the level of magnetisation of oxygen-rich blood and oxygen-poor blood as a basic measure. The result is graphically presented by colour-coding the strength of activation across the brain or the specific region studied. This technique has enabled neuropsychologists to localise activity to within millimeters.

The use of fMRI has enabled different brain functions to be localized. The last two decades has seen the development of transcranial magnetic stimulation (TMS). When neurons

involved in an ongoing task are magnetically targeted the processes involved are disrupted. Using TMS in conjunction with fMRI, the observed neuro-disruption is furthering understanding of the causal relationship between brain areas and specific psychological functions (Bestmann, Ruff, Blankenburg, Weiskopf, Driver & Rothwell, 2008).

While these techniques show biological changes occurring in localised areas of the brain, they do not enable us to 'see' thinking and learning. This gap in our understanding is bridged by psychological models that relate to cognitive processes. Cognitive neuropsychology explores the link between the biology of the brain and the cognitive processes of the mind (Neuroscience and Education, 2013). An analogy is the link that exists between the electronic calculator and mathematics. The principles of mathematics will not be found by taking the calculator apart. Mathematics is an emergent process that cannot be explained in the same terms as the physical entity that allows the computations to be made. The same can be said of the brain. While we can locate where specific activities are occurring, we need hypothetical constructs to explain the observed behaviour. Such cognitive constructs may be investigated using the scientific methodology which is the cogent position held by Boden (2006), who argues for cognitive processes to be investigated as if they were machine like artefacts that follow scientific principles (Mind As Machine, p 12).

Cognitive neuropsychology studies the structure and function of the brain as they relate to different psychological processes, cognitive, affective and behavioural. In the past the human brain was considered by psychologists to be the 'black box'. Researches could only understand what they could manipulate and control, thus environmental factors were dominant in explaining human behaviour. Behavioural psychology, par excellence, offered the best models to explain the causal relationship between what went into the box, - stimuli, and what came out,-response. With fMRI neuropsychologists are able to study the brain while it carries out different processes. This has enabled specific areas of the brain to be located for different functions. Using fMRI, Fassbender et al (2004) found that control of behaviour could be separated into distinct functions which were performed by discrete cortical regions.

2.11 Brain research and causality

Neuropsychology is a relatively new science and information about the structure and function

of the brain is continuously emerging as a result of the new tools for investigating the brain. However, caution is needed in how the findings obtained from the new research techniques are interpreted. The scientific method is deterministic in that it accepts the law of causation which holds that later events can be theoretically predicted as the result of earlier ones. However being able to predict behavior through observing neural activity on a brain scan is not yet achievable. This is on account of the complex integration of brain networks involved in cognition and behavior. The linear model that expects one factor to link causally to another is of limited value. Neuro- psychology also uses reverse inference, that is based on neuroimaging data, inferences are made as to the cognitive and behavioural processes occurring as a result of the activity observed. Neural activity detected in a brain region when a certain behavior is performed may not be causally related. It is equally possible that the neural activity in a given brain region may be activated by many different processes that occur in other regions. Because two events appear to be concomitant in time does not prove a causal relationship. Extrapolating laboratory finding to the real world can be seen to be thwart with problems. It follows that considerable caution is needed when inferring the role of the frontal cortex in observed behaviours.

2.12 Cognitive neuropsychology and executive functioning skills

Most everyday human functioning is managed by a set of processes that can be separated into distinct psychological functions. As McAtee (1999) explains: “A great deal of an individual’s everyday functioning is monitored by an overriding ‘executive’ or ‘managerial’ process, a process that controls what, and how much, behaviour is displayed.” (P. 35).

"Executive" suggests a cognitive control process (Miller, 2000). Researchers have emphasised different aspects of this control process. For example, for Shallice and Burgess (1991) it was ‘supervisory’, while for Grafman and Litvan (1999) it was managerial. While researchers employ different hypothetical constructs, all are in agreement that executive functions are considered to be “neuropsychological capacities” associated with the prefrontal cortex of the brain (Mcloskey, Perkins and Divner, 2009).

Typically cognitive theorists consider EFS to be a generic concept that includes such processes as:

- maintenance of a problem solving set for future goals (Pennington, Bennetto, McAleer and Roberts, 1996, as cited in Lyon & Krasnegor, 1996).
- organising behaviour over time (Denckla, 1996, as cited in Lyon & Krasnegor, 1996).
- self-monitoring and self- regulation (Borkowski and Burke, 1996, as cited in Lyon & Krasnegor, 1996)
- conforming to rules of social behaviour (Price, Daffner, Stowe and Mesulam, 1990)
- skilful use of strategies (Graham and Harris, 1996, as cited in Lyon & Krasnegor, 1996)
- using rewards and punishments to enhance learning (Giedd, et al 1996)

As long ago as 1993 Hart and Jacobs summarised the functions of the frontal cortex as:

- Deciding what to attend to and what to do.
- Providing continuity and coherence to behaviour over time.
- Modulating affective and interpersonal behaviours to ensure needs are met in accord with internal and external constraints
- Monitoring, evaluating and adjusting to achieve goals.

Until the beginning of the twenty first century. EFS were mainly studied in adult populations. This was because the brain was thought only to be functionally mature at this time (Hughes, 2002). However, the development of such new disciplines as developmental neuropsychology and cognitive neuropsychology, combined with the new methods for investigation, meant that EFS in early and late childhood became accessible.

While it is a popular analogy, it is misleading to view the prefrontal cortex as the executive office, where the Chief Executive Officer (CEO) resides to direct and monitor all activities. There are many different EFS and these can operate separately from each other. When one is active, not all of the pre-frontal cortex is active, only a specific area. Also, when one EFS is activated, it works in concert with other parts of the brain (Picton, Alain and McIntosh 2002, as cited in Stuss, & Knight, 2002). When the brain is actively involved in such processes as cognition, emotion or action, complex neural circuitry become active. While some neural overlap exists between the EFS, each has its own unique neural pathway through the pre-

frontal cortex.

The mapping of pre-frontal cortex areas for EFS is embryonic. As research techniques continue to improve, so will the detail of how EFS are located and function in the cortex as well as how they link to other areas of the brain (Lichter & Cummings 2001).

A model that attempts to encapsulate the complexity of EFS was suggested by McCloskey, Perkins and Divner (2009). It is different from others in that it is a holarchical model, not a heirarchical model. They see EFS as 'directive processes'. That is they give the command to engage in feeling, perceiving, thinking and acting. They do not carry out the activity themselves. A much used metaphor is that of a conductor in an orchestra. However, such could lead to reasoning that the conductor is some form of homunculus or a 'ghost in the machine'. That would result in the need for another psychological model to explain the psychology of the conductor - the type of argument that psychologists have always eschewed. A holarchical model avoids such a dilemma. This sees each EFS as being a complete and independent entity, which is part of another system that is larger than itself. Each can be explained in its own terms of development.

A working definition of EFS is that they "are directive capacities that are responsible for a person's ability to engage in purposeful, organised, strategic, self-regulated, goal-directed processing of perceptions, emotions, thoughts, and actions" (McCloskey, Perkins and Divner, 2009, p. 15). An important function is that they enable the individual to stay focussed on a goal, utilise the correct means to achieve the goal, and resist distractions from achieving the goal. From a psychological perspective, EFS can be viewed as an umbrella term for a set of hypothetical constructs that explain emergent processes based on brain activity. They are the functions that the brain carries out to control our attention and behaviour (Moraine, p. 2012). Essentially, they allow goals to be set and achieved.

It should be evident from the heterogeneity of opinions on EFS that no universally agreed classification yet exists as to what precisely EFS are, and how they can be measured.

Researchers vary as to what they include in their list of EFS. The present research utilises the assessment framework constructed by Gioia, Isquith, Guy and Kenworthy (2000). For

them there are EFS that relate to cognitive processes and others concerned with behavioural ones. This research is concerned with the EFS that manage behaviour namely:

- Response inhibition which is the ability to resist or not act on an impulse, the skill to think before acting.
- Emotional Control. This is the ability to control emotional responses in order to complete tasks at hand.
- Shift. A key feature is that of problem solving flexibility. Some children can repeatedly use the same strategy despite evidence that it is not working

Other EFS are to do with metacognition and are as follows:

- Initiation. The skill of being able to self-start any activity as well as the ability to generate new ideas
- Working memory. Relates to the ability to hold in mind information relevant for the completing of specific tasks
- Plan/organise. The skill to manage the demands of present and future goals

It is worth noting that researchers of EFS consider them to be intertwined with each other. Distinguishing one from another is difficult at best, and may not even be feasible (Moraine, 2012).

2.13 Executive functioning skills and maturation

We are not born with EFS, the potential is there, just as the potential for language and other complex processes are. A likely explanation is that there exist innately hard wired potentials. Their development will be the result of the interaction between a child's genetic inheritance, biological and environmental factors. Of special relevance to this research into behaviour is that one of the first EFS to develop is behavioural inhibition (Barkley, 1997). This enables children to inhibit a particular behavioural response. When language has developed the child can 'stop, think and choose.' That is they can delay a response to a stimulus (Barkley, 1996; Hayes, Gifford and Ruckstuhl, 1996). Human language enables a delay between the stimulus and response, during which the informational content of a message can be separated from its

emotional charge. Language allows for events to be evaluated rationally and logically, unlike animals that respond totally and immediately to any stimulus (Bronowski, 1967). Having this skill enables children to succeed in class through being able to not shout out impulsively, change unsuccessful behaviours and to not be distracted by external stimuli.

EFS begin to emerge in the developing brain at a very early stage (Eliot, 199; Posner and Rothbart, 2007). A baby's foetal brain develops sequentially from the 'bottom up'. Phylogenetically, the older parts of the human brain developed first (Dobbing, 1997; Gogtay, 2004). These contain behavioural patterns linked to survival and are hard wired into the brain. At birth babies have neurons wired for such essential behaviours as breathing, eating, sleeping, crying etc., while later ones are the result of experiences which result in the learning of new skills which substantiate neural pathways (Coch, Dawson and Fischer, 2010). Complex processes emerge through the interaction between brain and environment, learning cognitive skills is experience dependent. For example the brain has the innate propensity to develop a language, but which language will be acquired depends on exposure. Similarly EFS are nascent at birth and emerge through the complex interaction of genetic, biological and social factors.

Maturation of the pre-frontal cortex is central to an understanding of child development. As Posner and Rothbart (2007) explain:

It has long been believed that the development of the frontal cortex allows the child to move away from being bound by external stimuli. The development of frontal control mechanisms allows children to demonstrate voluntary control of actions and to delay gratification. The child's ability to resist control from current input gives rise to our feeling that toddlers, unlike infants, have a mind of their own. (P. 79).

Evidence from developmental psychology can now confirm the role of the frontal cortex in enabling children to control their behavior (Welsh and Pennington, 1988; Welsh, Pennington and Groisser, 1991).

The brain is the key organ that determines successful adaptation (Karatoreos and McEwen, 2013). EFS are essential for complex behaviours. The ability to plan, defer gratification,

persist with goals when faced with frustration and possible failure, are some of the key EFS that makes us different from most other species. Though research shows that our close relatives eg primates have some of these skills as well (Mandell & Ward, 2011).

It is maturation of the brain's neural pathways in conjunction with environmental experiences that allow the emergence of EFS. From as young as 3 - 6 months old, babies show signs of emerging EFS. Research has found that a baby's eyes will follow a moving object, but also, at times, start to focus slightly ahead of the moving object indicating that the baby is anticipating where the object is going (Eliot,1999). For Eliot neural growth in the frontal cortex is enabling the baby to choose where to look. It also indicates that the baby is not simply reacting to external stimulation. (Evidence such as this challenges, as it will be argued later, an over reliance on behavioural principles in the classroom). This provides evidence of the infant's developing specific self-control abilities that enable intentional action. Since the baby continues to look ahead, this shows that he or she is predicting where something will move to, necessitating a degree of control. Other studies show twelve-month-old infants showing planned, goal directed behaviour for example (Diamond and Goldman-Rakic, 1989). The ability to inhibit behaviour incompatible with obtaining a goal has been observed in eighteen-month old children (Vaughn, Kopp and Krakow, 1984). It appears that from infancy onwards, embryonic EFS can be observed in all children (Welsh and Pennington, 1991). Clearly EFS are part of normal development, and brain research provides evidence for the developmental increase in complexity through maturation (Brocki and Bohlin, 2004).

There is strong agreement from the above research that EFS begin at a developmentally early stage. Their emergence is dependent on the growing neural complexity of the pre-frontal cortex which occurs through maturation over time.

2.13.1 Maturation and time

EFS progress in line with the maturation of the neural circuitry in the frontal lobes. Over time, children's ability to self-regulate their behaviour, to overcome obstacles to goals improves. Time is a continuous variable, as opposed to a discrete one. Individual developmental variation is a natural occurrence in all children as they develop. Consequently there will be differences in the acquisition of EFS. Instead of uniform development of the

skills, there may be some that are more developed than others as suggested by the holarchical Model of Executive Functions as proposed by McCloskey, Perkins and Van Divner, (2009). The education system sets arbitrary timelines. For example, at age eleven most children will leave their primary school for their secondary. This is irrespective of their ability to cope with such a transition. Such disparity in the necessary skills can result in a child experiencing problems in the classroom.

2.13.2. Developmental variation.

Using the holarchical Model of Executive Functions as proposed by McCloskey, et al., (2009), differences between individuals can be readily explained. The development of any individual EFS can occur in isolation. A pupil may have good EFS in one area but not in another. The skills are not hierarchically linked, in that some skills need to be acquired before others. For example a pupil may have good planning skills but poor impulse control, or poor planning skills but good impulse control.

Neuropsychological research is also providing models to explain certain behavioural anomalies. Pupils can often appear quiet and content when engaged in an activity of their choosing. However, when directed by an adult, deviant and/or difficult behaviours may be observed. Brain research has shown that there are slightly different neural pathways within the frontal cortex and other regions of the brain depending on the locus of command (Barkley, 1997, 2005). When working alone on a self-directed task, it is logical to consider that there are effective internal states of motivation and desire being drawn on, so this state can continue calmly. However when an external force (eg the teacher) makes a request, this may disrupt the student from his or her homeostatic internal states, causing a disturbance that can then be experienced by others present. This may explain why some pupils can find it extremely difficult to disengage from a task or activity of his or her choice and become externally directed (McCloskey, et al., 2009).

2.14 Executive functioning skills and gender

Much is written regarding EFS and the different medical conditions that can interfere/damage EFS development. Historically, as will be seen below, EFS has been studied in specialist populations of individuals with some degree of pathology. Studies using typical school

learners are a rarity. Furthermore, gender differences in typical neurodevelopment has not been extensively researched. This is surprising, given the frequently made observation, by parents and teachers, that girls mature inter and intrapersonally earlier than boys. (De Bellis, Keshavan, Beers, Hall, Frustaci, Masalehdan, Noll & Boring, 2001).

This pattern is also paralleled by advanced frontal lobe development in girls (Reiss, Abrams, Singer, Ross & Denckla, 1996). It would be reasonable to assume that such differences have an impact on activity within this region of the brain. Evidence suggests that sex hormones have an impact on how the brain is organised at a very early stage (Kimura, 1999). The environment is consequently acting on brains that are wired differently, according to gender. Gender differences, it can be argued, are a summative interaction of biological, neurological and endocrinological factors. Wright, (2010) observed that boys had more difficulties with EFS than girls, leading her to suggest that, “males may benefit from interventions targeted at executive functioning difficulties more so than females in the general education population.” (P.131). While this is one interpretation the causal link could be more complex. It could also be argued that it is not solely gender that has produced this difference. The EFS of boys function differently on account of the socialization process they have experienced. It is not necessarily a matter of girls having more strongly developed EFS than boys. It may be that the socialisation process experienced by girls chimes more closely with classroom expectations, whereas for boys the processes are potentially conflictual which may be disadvantageous to them in both the immediate and longer term.

While there has been limited consideration of EFS and gender, there would appear to be a gender bias. Resources for EFS frequently use male case vignettes to illustrate different issues concerning problems in EFS (McCloskey, Perkins and Divner, 2009). Reference to gender as a possible variable in understanding the development of EFS is rarely referred to (Cooper-Kahn and Dietzel, 2008; Moraine, 2012; Dawson and Guare, 2010).

2.15 Executive functioning skills and problematic behaviour

There are many reasons for some children having problematic behaviour in the school context. These will include factors such as how learners relate to themselves, their peers, significant adults and the curriculum (Ellis and Tod, 2009). All behaviour is a complex

phenomenon and problematic behavior even more so. The number of linked contributory factors, biological and environmental means that any 'end state' can be the result of different pathways. As Emerson and Einfeld (2011) put it, 'behaviour will reflect the principle of equifinality' (p. 59). That is in an open system where influences can occur at different times and in different combinations, then any outcome can be the result of many causal pathways and not necessarily only one.

Today, neurological studies indicate that many learners with problematic behaviour have essentially under developed EFS (Clark, Prior and Kinsella, 2002; Hughes and Ensor, 2008). This means that they have serious weaknesses in such skills as response inhibition, transferring activities and managing feelings, which are key skills for behavioural self-regulation (Hofman, Schmeichel and Baddeley, 2012).

In this study the concern is with the 'end state' conceptualised by the unifying psychological construct as EFS. The possible explanations for learners experiencing difficulties in EFS are many. As a National Prescribing Centre publication (2011) for the National Health Service (NHS) explains, a complicated system is one where a clear set of stages need to be followed to achieve a set outcome. A mechanical approach can work in such circumstances. For example putting a man on the moon, is complicated, but there are fixed steps that need to be followed. Understanding a child's disruptive behaviour in class is complex. Similarly classrooms are complex systems, different teachers can effectively manage the same class in different ways. There are many different ways of explaining and achieving the same educational end goal.

In the early years it is not uncommon for non-disabled children to exhibit prototypical problematic behaviour (Broidy, Nagin, Tremblay, Bates, Brame and Dodge, 2003). Temper tantrums and aggressive behaviours peak at around 2 to 3 years of age. After this they typically decrease in both severity and frequency (Tremblay, Nagin, Seguin, Zoccolillo, Zeazo, Boivin, Perusse and Japel, 2004). The reasons for these changes can be seen to be linked to a child's improved problem solving skills, impulse control and response inhibition. These are key EFS combined with increased social understanding and empathy.

2.15.1 EFS and childhood conditions

Like a rash, executive dysfunction is a symptom that sometimes appears alone and sometimes is part of a larger problem. This broader diagnosis might describe a learning disability (LD), autism spectrum disorder (ASD) or other condition, such as a range of neuro-developmental, psychiatric and medical disorders. (Cooper-Kahn and Dietzel, 2008, p.4).

In typical or ordinary developmental patterns, EFS are acquired through maturation, but for children who face a range of childhood disorders the development of these skills is inhibited to varying degrees. The causal relationship between the disorder and the lack of EFS development is problematic. Whether the disorder caused the lack of EFS or a lack of EFS lead to the disorder is still under neurological investigation. For the moment comorbidity would seem to be the safest explanation (Elliott, 2003).

Many who work and support troubled children and young people (Perry, 2008 and Batmanghelidih,, 2007) suggest that the brain relies on specific environmental conditions for healthy neuro-development. Perry highlights the negative impact on brain growth in children who are deprived of a secure and caring attachment figure and Batmanghelidjh, a committed supporter of troubled young people, expressed similar views, arguing that brain scans show that children who have experienced poor parenting have inadequately developed pre-frontal lobes. However attachment disorder remains poorly defined and is as a result a questionable explanation. The evidence is usually based on very extreme cases of deprivation and the findings then generalized to be the norm. Inductive reasoning, that is from the particular to the general makes for a weaker argument. The ability to have control and/or comparison groups is needed to add rigour to the claims that are made and popularized in some publications (Perry, 2008). A more reasoned and tentative hypothesis would be that secure attachment in the formative years contributes to neuro-development which enables future learning.

EFS difficulties are seen by many as being a symptom associated with such disorders as Autistic Spectrum Disorders (Ozonoff, Beth, Goodlin-Jones & Solomon, 2005, traumatic brain injury, (Ewing-Cobbs, Prasad, Landry, Kramer and DeLeon, 2004). Poor EFS have also been observed in children from low socio-economic backgrounds (Kishiyama, Boyce, Jimenez, Perry and Knight, 2009) the children from the disadvantaged background

performing more poorly on measures of attention. The research referenced above does however suggest that there is a link and probably a causal link between pre-frontal cortex functioning, cognitive functioning and social inequalities. Neglected children have been found to have EFS difficulties in tests requiring mental flexibility (Nadeau and Nolin, 2013). Such evidence supports the view that disadvantage in the early years has negative consequences on high-level cognitive abilities (Jensen, 2009).

2.15.2 EFS and Attention Deficit/Hyperactivity Disorder (ADHD)

Given the increasing number of children diagnosed as having ADHD, attention has been focused upon an EFS perspective. ADHD is a neuro-developmental disorder that is usually diagnosed in childhood with symptoms that typically persist into adolescence. Key researchers in the area of ADHD believe that diagnoses should be re-conceptualised to make specific reference to the fact that difficulties in EFS are a key component (Brown, 2005; Barkely, 2006; Denckla, 1989). Children and young people diagnosed with ADHD typically have impairments in EFS. Willcutt, Doyle, Nigg, Faraone, & Pennington, (2005). Hughes, Dunn and White, (1998) investigated 'hard to manage' pre-schoolers and found executive deficits. ADHD remains a controversial diagnosis with considerable debate with regards to its medical and educational value (Cooper and Bilton, 1999).

While there are many assessments for ADHD, it is worth noting here that the Behaviour Rating Inventory of Executive Function (BRIEF) has been found to have predictive value in identifying the ADHD status of adolescents (Toplak, Bucciarelli, Jain and Tannock, 2009). In this study there were two groups, one group (N= 46) had a diagnosis of ADHD using *DSM-IV* criteria which was confirmed through a comprehensive clinical assessment and a control group (N = 44). All adolescents were between the ages of 13 years and 18 years (mean age = 15.5 years; *SD* = 1.4). Parents and teachers were asked to complete the BRIEF (Gioia et al., 2000). While the results were based on a relatively small number of BRIEF questionnaires from teachers (n = 37) significant associations were obtained between performance on the executive function measures and the BRIEF parent and teacher reports. The results indicated that the scales of the BRIEF were measuring aspects of executive processes in those adolescents with ADHD. Therefore these results can be considered valid and generalising from these findings is appropriate.

To conclude, children with different disorders and conditions can have similar behavioural difficulties because they have difficulties in the same EFS.

2.16 Education initiatives and neuroscience

There are already many examples of educational packages that make claims based on dubious neurological evidence. Often there is only a ‘small’ element of truth in the hyperbole (Dekker, Lee, Howard-Jones, and Jolles, 2012; Blakemore, 2013). Despite its popularity, there is little neural evidence that assessing a child’s preferred learning style is of any real value, there is usually neuron activity in both hemispheres (Kratzig and Arbuthnott, 2006).

Despite many of these programmes being widely used, critics suggest that we are not yet at the stage where scientific evidence exists to support the use of such programmes as Brain Gym. Very little research supports the notion of brain gym as being beyond that of providing an exercise break for learners. The view here is that it remains an educational initiative that is untested and not validated (Spaulding, Mostert and Beam, 2010). Yet the development and use of such programmes began as long ago as the 1960’s (Brain Gym, 2011).

2.16 Research directly related to the current study

Literature examining the neurological basis of EFS is considerable. The ability for clinicians to assess EFS is equally impressive (McCloskey, Perkins and Divner, 2009). Research into childhood disorders has clearly shown that while significant differences exist between disorders, the one common feature is the impact they each have on EFS. Yet, when interventions to remediate this difficulty are sought, there seems to be a paucity of empirical evidence. In fact, as McCloskey, Perkins and Divner (2009) observed, “there is minimal evidence-based literature available that addresses executive function interventions” (p. 188). However this conclusion is not necessarily justified. As detailed below there are well documented examples of training programmes to develop EFS. Thorell, Lindqvist, Bergman, Nutley, Bohlin and Klingberg, (2009) investigated whether pre-school children could be trained to improve such EFS as working memory and inhibition control? The children underwent a five week training programme with specific activities to strengthen these skills. They found that both were improved but the inhibition skill did not generalise from the trained task to untrained ones. Other Swedish colleagues used an intense programme and

successfully improved working memory, inhibition and reasoning in children aged 7 - 12 years (Klingberg, et al 2005). Also Kerns, Eso, and Thomson (1999) found training improved such EFS as vigilance, selective attention, shift and inhibitory control. The value of spending time to improve EFS is not only for improved school behaviour (Blair and Diamond, 2008) but also preparing school leavers to be adaptable employees (Center on the Developing Child, Harvard University, 2015).

EFS are central to children learning how to control their own feelings and behaviour. Being able to ignore distractions and inhibit impulses is an essential skill for any classroom. Even before EFS were as fully understood as they are today, evidence was accruing to show their importance for learning. Mischel, Shoda and Rodriguez (1989) in a classic naturalistic experiment with four year olds is one example. Children who were impulsive and unable to resist immediate gratification, of a marshmallow, were reported as having more behavioural problems in their school career. Those who resisted were found to have higher scores on a measure of executive control. Studies have shown that the EFS of children as young as four years could be improved when mainstream teachers employed a programme of activities (Adele, Barnett, Thomas and Munro, 2007).

Writers such as Goleman (2013) whose name is closely associated in the mind of the general population with 'emotional intelligence', stresses the ability to 'focus' as an essential skill, which he construes as an EFS, arguing that such skills as "attention control and the ability to resist temptations" (p. 86) are better predictors of educational achievement than a child's IQ.

The development of EFS can vary from child to child, that is inter-individual variation. Also there can be intra-individual variation, meaning that some EFS can be well developed in an individual child, and others less Cooper-Kahn, 2008). There are also no firm time lines for the emergence of EFS (McCloskey, Perkins and Divner, 2009). While there is a reconfiguration process taking place within the adolescent brain (Feinstein 2004; Laser and Nicotera, 2011), this review has already shown that EFS are developing from early infancy (Dawson and Guare, 2004). This leads to a very positive conclusion. A child's current neural network can be altered, meaning that brain functioning can be improved through an intervention programme. The degree of change that can occur will of course depend on many factors, but there would be an expectation that children with severe learning difficulties

could improve.

Relevant research to justify the study at hand would need to relate to how in-class behaviour links to EFS. The next part of the study examines this. Being able to concentrate and pay attention in class is a skill needed by all learners. While there are many reasons for inattentive behaviour, EFS have been found to be a valid indicator as to whether a child is attentive or not. Scope, Empson and McHale (2010) looked at nine year old children. One group were considered to be attentive in class and another group were not. The best indicator as to which group a child would belong to was a measure of their working memory and inhibition control. That is EFS skill deficits were the determining variable. As the assessment for hyperactivity and impulsivity was made by the teacher who knew the children an issue of possible researcher/assessor bias is raised. While the two groups were compared no control group was used to establish if a significant difference existed at the extremes for each variable. Also a study by Gathercole and Pickering (2001) studied four groups of children with SEN, many had weaknesses in their working memory which explained their learning problems with reading and numeracy. However those children who had behavioural difficulties did not have a working memory deficit and were competent in reading and numeracy.

Further informative and pertinent research was published in the journal *Emotional and Behavioural Difficulties*, which is produced by the Social, emotional and behavioural difficulties association (Sebda). This was carried out in a special school for primary aged children assessed as having EBD (Frederickson, Jones, Warren, Deakes and Allen, 2013). This research was concerned with the changing profile of the children attending the school. Whereas in the past social learning and attachment theories had informed the school's interventions, these no longer seemed to work. The study focused on neurological findings that suggested a difference in profile of children with EBD. One group was considered to be proactively aggressive on account of a genetic predisposition (Viding, Blair, Moffitt and Plomin, 2005). The other was reactively aggressive due to environmental adversity. The intervention programme used was 'Let's Get Smart'. This is a 'multi-stranded behaviour intervention programme' designed by the third author (a practising EP), based on neuroscience, and which stressed the importance of EFS in enabling children to self-regulate their thinking and behaviour. The BRIEF was used to assess changes. The results were

promising enough for the authors to suggest that “neuroscience-informed ways of thinking about children’s behavioural needs is relevant to designing appropriately differentiated interventions” (p.150).

The claim made above of a lack of empirically tested interventions is questioned further by the following. EFS is central to any human activity (Baumeister, Brandon and Vohs, 2007; Cooper-Kahn and Dietzel, 2008). Clinical treatments for anxiety, depression and obsessive compulsive disorder all involve EFS if a person is to regain control of their thoughts, feelings and behaviour. Consequently many interventions that have been developed in different settings are of value when the aim is to improve a specific EFS. Techniques from Cognitive Behavioural Therapy (Stallard, 2002) and Mindfulness (Greco and Hayes, 2008) are examples. Any intervention programme will assume that EFS can be improved and that interventions can activate the necessary EFS neural networks, which, if frequently practised, will become an automatic response pattern.

The frequent repetition of such neural networks results in learned behaviours becoming ‘wired together’ into sub-routines. Sometimes referred to as ‘zombie systems’ (Hrekow, 2013) which are assessed automatically. A description of this phenomenon was first made by William James (1890 as cited in James, 2007), who famously reported going up stairs to change, but instead found himself in bed. In psychology the distinction is made between actions that require conscious effortful control and those that are executed automatically.

Recipe type books for developing EFS in the classroom provide essential resources for busy class teachers and support staff. They offer practical suggestions, such as “How to Create a Classroom Culture That Promotes Executive Function” (Meltzer, 2010). Often suggestions will be familiar to all experienced teachers and support staff, such as teaching learners to problem solve, goal setting, organising and planning. Dawson and Guare (2010) similarly offer structured interventions for specific executive skills. What is needed, though, are rigorous UK accounts of how interventions have been empirically tested to confirm their efficacy.

Given that EFS has been implicated in many childhood disorders, it could be expected to be an area of interest and relevance to practising EPs. As will be shown, a review of the main EP journals justifies the need for this area to be studied more frequently.

Educational Psychology in Practice contained one article that specifically investigated EFS. This study by Booth and Boyle (2009) was concerned with reading abilities. They found that poor performance on an inhibitory task correlated positively with difficulties in reading abilities. The study produced valuable information for assessing and predicting the likelihood of boys having reading difficulties. It was not concerned with how the weak inhibitory skills could be improved and whether if included would show benefits in reading. This research also lent weight to the hierarchical model proposed by Mcloskey, Perkins and Divner (2009). In their model EFS has two components - cognitive and behavioural. The cognitive ones were most involved with learning. They involved working memory, organisation and planning. The model does suggest that there is a degree of overlap between the skills and the areas. Consequently, weak behaviour-regulation skills, such as response inhibition, would allow distractions which could result in learning difficulties, a finding shared by Booth and Boyle (2009).

Educational Psychology in Practice has published many articles on specific disorders of children and adolescents: ADHD (Cains 2000; Holowenko and Pashute, 2000; Rush and Harrison, 2008); Autistic Spectrum Disorder (ASD) (Thomas and Smith, 2004; Gus, 2000; Barrett, 2006), and Aspergers Syndrome (Reilly, Campbell and Keran, 2009; Wilkinson, 2005) being some of the most frequent. Children in care also figure frequently: (Thomson, 2007; Greig, et al 2008; Jackson, Whitehead and Wigford, 2010). Articles on whole school behaviour and classroom behaviour are also well represented (Poulou, 2005; Apter, Arnold and Swinson 2010). Though a behavioural perspective dominated, articles concerning the nature of the profession as well as consultation issues figured strongly: (Fox, 2009; Webster, Hingley and Franey, 2000).

A search of the DECP journal *Educational and Child Psychology* similarly produced no specific articles relating to programmes to develop EFS. A balanced conclusion would seem to be that while research has been undertaken to develop EFS in children and young people, it has not figured in the main journals that publish the research undertaken by UK practising EPs, forcefully justifying the need for studies to plug this gap in the literature base.

2.17 Summary of the literature review

Section 1 considered the history and role of practising educational psychologists. This was

considered important to understanding the debates that continue to shape current EP practice. A discussion of what makes educational psychology psychological, places this study firmly in favour of it being a scientific investigation into human behaviour and experience. This information will prove important when epistemological and methodological matters are discussed in the next section.

Section 2 tackled the complex issue of behaviour. Approaches to in school behaviour and the different models that have been used to explain problematic behaviour are presented. The role of governments in understanding and responding to behaviour cannot be underestimated. An overview of key commissioned government initiatives and legislation was considered necessary. The wider picture having been covered, the review then examined specifically the role of the teacher in classroom behaviour management, combined with EPs work and their contribution in this area.

Section 3 looked in detail at the contribution made by cognitive neuropsychology to our understanding of complex cognitive processes, specifically the role of the prefrontal cortex and the development of EFS. The breadth of relevance to all children that these processes have was emphasised. The review concludes that EFS to date has not figured significantly as an area of research which is published in the main journals for practising EPs. An account is presented of research in a special school that reflected the value of linking behaviour initiatives to cognitive neuropsychology. Similar studies are needed in a main-stream setting. This is especially necessary as many neuro- educational initiatives are used in UK classrooms that have little or no scientific evidence for their veracity.

2.18 Rationale for the current study based on the literature to date

This review has shown the continuing concern towards school behaviour and the important role teachers have as well as the support EPs can provide. EPs have drawn extensively on behavioural psychology for improving teacher skills in managing behaviour. However, new approaches have been opened by theories based on cognitive neuropsychology. The final section details the breadth and relevance of EFS to an understanding of how all children develop skills to self-regulate their behaviour and the reasons why some face difficulties. There are many ways of assessing children and young people's EFS. This study is concerned with being able to improve them. The question of whether EFS can be improved at a whole

classroom level in a mainstream school will be considered by this study. Such a research question has valid implications for the behaviour of all children including those with or at risk of SEBD.

2.19 Objectives and hypotheses of the study

The main purpose of this study was to investigate specific questions about changes in the self-regulatory aspects of executive functioning skills. The study took place in a mainstream primary school and involved two year six classes to address the questions of whether:

- a) Standardised scores on a measure of behaviour regulation (a component of executive functioning skills) show improvement after a targeted intervention programme, the discrete variable.
- b) Standardised scores on a measure of behaviour regulation show improvement as a result of time allowing for increased maturation, a continuous variable.

CHAPTER 3: Epistemological Considerations

Before the research questions were investigated a consideration of ontological and epistemological issues was necessary. All psychological research needs to be clear as to the kind of data and information to be collected. Whether such is to be quantitative or qualitative will influence the choice of research method, experimental or naturalistic. Finally, for this thesis, the question, “Is psychology to be considered amongst the natural sciences or one of the humanities?” will be explored. An examination of these important issues will be presented prior to the Method section.

3.1 Epistemological position - research paradigm

There are competing epistemological positions as to what knowledge we can obtain and rely on. These need to be considered to justify the research methodology employed by this study. There are three dominant views that seek to explain what kind of knowledge we can be sure of.

3.1.1 Scientific approach and causality

The natural sciences hold to the position that there is an external world that can be objectively studied. It believes that an individual’s perception of what is being observed does not result in any misrepresentation. Different observers will still observe the same phenomenon. This position, known as ‘positivism’, adopts a scientific approach. It aims to control and manipulate variables as it searches for causal relationships. Such an approach is described as nomothetic, which is to say it seeks universal principles that apply to the same events, even when they are in different places. Observers may have different subjective characteristics, but these will not alter the nature of what they are observing. What is being observed exists external to them. However, educational research is different from scientific investigation into natural occurring events. Educational researchers usually do to some degree interact with their subject matter. Two teachers interviewing a pupil who has displayed problematic behaviours are likely to receive different accounts. The age, gender, ethnicity and other such factors of the researcher may contribute to change the nature of the interview. If the ability to change one competent researcher with another, and still produce the same results is the bench mark for scientific work, then most educational research cannot be considered to be scientific (Taber, 2013, as cited in Wilson, 2013).

A major contributor to the scientific approach was Karl Popper (1959). Popper believed that the only statements about events that could be scientifically tested are ones that have a reference to empirical evidence. This excluded moral judgements and value statements. The hallmark of all scientific statements is that they can be disproved. Popper was able to challenge the prevailing idea that science was inductive in how knowledge was obtained. That is that universal laws were obtained through the examination of particular facts. In truth, to employ a classic example, the fact that no white swans had been observed, cannot be used to argue that white swans do not exist. Universal truths cannot be based on limited observations. Popper contributed to the post-positivist movement in arguing that science relied not on collecting general truths, but in excluding possibilities through falsification. Post-positivists being united “ in their adherence to fallibilism - the idea that all scientific knowledge is potentially subject to the discovery of error and thus should be regarded as provisional (Swann, 2003, p. 253-4).

For the aims of science to be achieved using a positivistic approach, there is a need for quantitative data. Once a numerical value is attributed to a psychological construct we have quantitative data. This will enable a causal relationship to be studied between variables that are being investigated. That is, if the manipulation of one variable results in a change in the measured value of another variable, then a causal relationship can be said to exist between the two variables. This causal link was described by the 19th-century philosopher John Stuart Mill as follows. A cause should precede an effect, and the best explanation for the effect should be the cause (cited in Shadish, Cook and Campbell, 2002, p. 6). The scientific drive to establish causal relationships reflects a basic assumption, namely that if you can predict a specific outcome between variables, then you will be able to control them.

Quantitative data

Obtaining valid data of any phenomenon is no simple task. Operationalising the construct is a very important step. That is, what procedures need to be followed to obtain data that validly reflects what is being measured, that is, construct validity. If a researcher is looking for causal relationship then it follows logically that he/she will need to measure variables and to manipulate them. To show changes in the size of a variable, some form of quantitative data will be needed. To only observe variables naturally occurring will reveal correlational

relationships, not causal ones. It follows that any findings will be limited by the questions that are being asked which themselves will need to be held to be pertinent and valid. These in turn are directed by the zeitgeist of the time and cannot therefore be entirely objective. Any positivistic research must necessarily include a bias or direction, and cannot hold to the extreme objectivity to which it aspires.

There is an inherent over-reliance in the scientific method for a ‘cause and effect’ model of human behaviour. That is the psychological understanding obtained is primarily, a causal description, rather than a causal explanation. This means that much of psychological research explains ‘how’ variables relate to each other, but not necessarily ‘why’ they do. The processes that led to variable A effecting a change in variable B, may require further investigation. For example, Skinner (1953) observed the effect different schedules of reinforcement had on animals’ behaviour. He observed how different schedules resulted in different behavioural response patterns. He did not know why they did, but it enabled our understanding of operant conditioning to become a cornerstone of behavioural psychology.

However, it is worth noting that a psychological description of how two variables link causally can have more value than an understanding of why they link. For example, Festinger’s Cognitive Dissonance theory (2012) describes how attitude change could be achieved through the control of the type of information presented that would cause psychological dissonance. It does not explain all of the processes involved, but it helped inform such campaigns as changing smoking habits.

3.1.2 Constructivism versus idiographic - understanding

A contrasting view is the idiographic approach. This is the study and understanding of particular events, also referred to as hermeneutics, which is the investigation of interactions and an understanding of meaning through communication. Such findings cannot be generalised and applied to other apparently similar situations. While there are various interpretative models, they each have a “concern with people’s grasp of their world” (Ashworth, 2008, p.4, as cited in Smith, 2008). Of special relevance to this approach was George Kelly, (as cited in Bannister & Fransella, 1986) who believed that to understand another person was to understand the personal constructs through which he/she perceived his

or her world. Kelly can be considered an early advocate of an anti-positivist, hermeneutic position (Kelly, 1986). Adherents of a constructivist and idiographic position would concur with Gadamer (1975, p. 239) “all understanding inevitably involves some prejudice”. An extreme anti-nomothetic position is taken by discursive psychologists. These see linguistic expression not as an expression of internal psychological mental states but the performance of social action (Gergen, 1994). For Gergen there is such variation in human behaviour between cultures and across different times that makes universal psychological laws unobtainable. The idea that human behaviour is a social construction occurs in the works of many thinkers within the social sciences. For example, George Herbert Mead considered the human mind “as arising and developing within the social process, within the empirical matrix of social interactions” (Mead, p. 133, as cited in Morris, 1967). The Russian psychologist Vygotsky considered that all thought was an internalisation of what had first been experienced in interaction with others (Vygotsky, 1986).

Qualitative data

Qualitative data can be defined as being concerned with the meaning that people make of their world. Some approaches that reflect this in psychology are thematic analysis (Braun & Clarke 2006) and interpretative phenomenological analysis (Reid, Flowers & Larkin 2005). Both look for the meanings behind actions. Such data is usually obtained through using interviews and naturalistic observations. Human beings have consciousness, and their actions are motivated to achieve goals. Qualitative data enables researchers to seek to understand the ‘intentionality’ behind actions. This is a fundamental difference to those who employ quantitative data. Quantitative data is used to refer back to normative statistical models of the phenomenon being studied. The cause of the behaviour lies in the past, through a chain of causality, not a future orientated explanation. Qualitative data gives richness and depth to human behaviour. It goes behind that which is observed and interprets the meanings that guide people’s actions. People are agents and their actions can only be understood if the meaning and intentions are made explicit. “Theory should not precede research but follow it” (Cohen, Manion and Morrison, 2003, p. 23). This approach is not without its critics: Rex, 1974; Giddens, 1976; Bernstein, 2003. While the meanings made of situations by participants is a valid area of study, the interpretations made are themselves the result of a structure of meanings and relationships that exist prior to any interpretations being

made. Therefore it is arguable that social scientists should aim to go beyond subjective accounts and search instead for an objective account of the social world.

The above two positions are not necessarily incompatible with each other. Each seeks to obtain different levels of understanding relating to the social world. Within psychology and education, both paradigms exist and have their place, depending on the questions that are being asked. Carnine and Gersten (2000) believe that there are two types of educational research. The first is descriptive research, used to build theories and to increase understanding. This accords well with the Interpretative approach described above. The second is experimental research, used to validate causal relationships and the validity of interventions. Clearly, using one approach does not mean that the other is rejected or invalidated.

A third epistemological approach that warrants inclusion is Critical Theory. This challenges the previous two and is overtly value laden and political in nature.

3.1.3 Critical theory

Both the positivists and the hermeneutics are themselves subject to criticism, though the scientific more than the interpretative. Habermas, a key figure in the Frankfurt School argued that both of the above approaches ignore how the phenomena they are studying are the result of specific political and ideological positions (Murphy and Fleming, (2012). They each uncritically accept the social world as it is. The positivists seek prediction and control, and the hermeneutics seek understanding and interpretation (Heshushius and Ballard,1996). Neither challenge the status quo. The Frankfurt School aimed to not only interpret the social world but to change it, in accordance with explicit values of equality and social democracy. This radical critique drew many of its ideas from Marxist philosophy. It is a small step to notice the influence of the ideas of Karl Marx, whose tomb inscription says, “The philosophers have only interpreted the world, in various ways; the point is to change it”. Habermas laid much emphasis on the concept of ‘praxis’, that is putting theory into practice. Even those who, as we have seen, argued against scientific positivism, and instead for an interpretive approach to human behaviour, are accused of ‘one dimensional thinking’. A position held by Marcuse (2002). The world they are studying is already an interpreted one.

It is socially constructed by the dominant social order. The ideology that dominates within a society determines, for example, how men and women are to be construed as well as what is seen as good parenting and what is not. Critical theorists in this school, such as Marcuse, (2002), Adorno (Adorno and Bernstein, 2001) and Fromm (2005) each challenged the established order, and specifically the way in which it was analysed by academics. In sociology, Talcott Parsons (2012), with his functional analysis of society was especially criticised as an example of a positivistic approach that explained how society worked, without challenging its inequalities.

It is essential for any researcher to have a broad appreciation of the epistemological issues involved. This can help inform the rationale behind the design of any study.

3.2 Evidence-Based Practice (EBP)

While the philosophical merits of each of the above positions continue to be debated, justification needs to be made for the methodology utilised by this study, namely a classroom based quasi experimental approach. Such an approach is strongly aligned with evidence-based practice (EBP). However, what is seen by some to constitute EBP may not be seen as such by others (Waas, 2002). Agreement or otherwise will depend on the epistemological, ontological and methodological positions adopted. A consideration of EBP will further clarify the approach taken in this study.

Many believe that EBP refers to scientific knowledge which is characterised by the use of positivistic methods (Kratochwill and Shernoff, 2003). This is not necessarily the case. EBP can seek to answer different types of questions. For example Feuer, Towne and Shavelson (2002) put forward a range of different questions that need addressing. To understand a phenomenon involves questioning “what is happening” as well as, “why it is happening”. Whether what is being observed is the result of a process or a mechanism. This is similar to the two types of causality detailed above. Often, as in the case of this study, research is looking to find out ‘what works’ and can be predicted to work in other like situations. When this is the case, the experimental method is best suited to give an answer.

This position does not negate or undervalue other methods, which are better suited to answer

different questions, such as an account of ‘what is happening’. If EBP is to inform school practitioners, then it needs to be able to show beyond reasonable doubt that, for example, a given intervention studied has the predicted effect often enough to make it a preferred option to no intervention.

A clear summary of EBP is given by Shavelson and Towne (2002) that it:

.... refers to a body of scientific knowledge about a range of educational practices that denotes research-based, structured and manualised practices that have been tested by rigorous, systematic and objective methods via randomised trials in which experimental and control groups or conditions are used to establish causation and to assess the magnitude of effects - the ‘gold standard’ of research. (P. 8).

Some researchers believe a strong bias exists within educational research in favour of the nomothetic approach. They argue that the case put forward that educational practices should be evidence-based results in a bias towards the scientific approach. They suggest that evidence-based practice and science are essentially synonymous (Berliner, 2002; Erickson and Gutierrez, 2002; Feuer, Towne and Shavelson 2002).

An interesting argument that suggests EPs are able to use either EBP or an interpretative model is made by Fox (2003), who describes the ‘EP Flip’. This is essentially how it is suggested, many EPs work. If all involved in a problem situation are in accord, then the EP uses an interpretative model. If there is discord between the EP and others, then the EP flips to a positivistic evidence-based model. This enables the EP to cite theoretical knowledge based on research evidence to justify his/her position.

The need for educational initiatives to be evidence based would seem to be too obvious a claim to need substantiating. Dunlosky (2013, p. 28) expresses concern about “how the latest and newest learning technique is eaten up even though we don’t know how well it works”.

However, others argue that to revisit this epistemological debate will detract from educational psychology making a contribution to educational research. Thomson and Anderson (2011) argue that the purpose of research is to further knowledge. It is through asking questions that this is achieved. Consequently, “the question must drive the method”. Adopting this viewpoint as a guiding principle will clarify the position taken in this study

from the perspective of both the epistemological approach and the methodology employed.

Conclusion

The question posed, namely, “Is psychology to be considered amongst the natural sciences or one of the humanities?” can now be fairly answered as, ‘it has a foot in both camps’.

For the positivists minded, people are products of their past, while for others they are actors creating their own tomorrow. The debate between these two epistemological positions has a long history within the social sciences. Essentially the positivists believe that understanding comes from “objectivity, measurability, predictability, controllability, patterning, the construction of laws and rules of behaviour, and the ascription of causality” (Cohen, Manion and Morrison, 2003, p. 28). The alternative approach, idiographic is, interpretative. It is concerned with how people make sense of their world.

3.3 Position of the researcher

The questions that a study seeks to answer will determine the method chosen. It is important then that the questions that this study seeks answers to are made explicit.

Questions for this research

Q Are the psychological constructs being investigated predicated on physical entities that have an independent existence?

A. Neuroscience, using fMRI, empirically shows specific brain activity that is concomitant with psychological processes.

Q. Is the study is concerned with investigating a causal relationship?

A. The study is exploring whether EFS can be enhanced using a specific targeted intervention.

Q. It is possible to quantify changes in the key variables?

A. A standardised assessment, the BRIEF, produces quantitative data.

Q. Is it aspired for the findings to have universal, nomothetic application beyond the study?

A. The sampling methods used make it necessary to consider this study a pilot. However, any findings will support further studies involving sample randomisation and will test the validity of generalising this approach to other similar situations.

The above indicates clearly that the appropriate epistemological position for this study is positivism since the scientific method will best reveal any causal relationship between the variables being studied. It is, though, a post-positivist perspective that is adhered to, that knowledge is obtained through a cycle of conjecture and refutation, that is the hypothetico-deductive method.

The current research project is concerned with investigating whether a targeted intervention programme could develop the EFS relating to classroom behaviour of a year six class of primary aged children. To this end an experimental method was adopted on the grounds that this would best determine whether the interventions were successful and whether the intervention had general application.

While human behaviour is complex, psychologists who have adopted a scientific model of investigation have proven its usefulness. Behavioural psychology has established general principles that have been shown to apply beyond the laboratory confines. For example, based on behavioural psychology, 'functional analysis of behaviour' has become one of the most rigorous methods for understanding the environmental contingencies that control behaviour (Sulzer-Azaroff and Mayer, 1977).

The current study is based on our existing neuropsychological understanding of brain processes. Knowledge in this area is essentially scientific deterministic (Temple, 1997). The psychological construct of EFS can be considered as a hypothetical construct, used to explain the empirical observations that neurological processes give rise to.

To summarise, the research is investigating whether specific targeted activities will develop EFS in a year six primary classroom. This study may provide universal classroom behaviour management methods that have application to other similar situations. To this end a nomothetic, scientific methodology is arguably appropriate.

3.4 Rational for a quantitative data collection

The use of structured rating scales to assess psychological and neuropsychological constructs has a long history. Questionnaires designed for teachers and home use to assess children's behaviour are well established (Achenbach, 1991; Conners, 1989). The epistemological position of positivism is that knowledge is necessarily empirical in nature, and is independent of the observer. That is any knowledge is obtained through sense experience and is obtained through observation and experimentation (Cohen, Manion and Morrison, 2003). Different observers will still observe the same phenomenon. The use of a questionnaire to assess the psychological phenomenon being studied would ensure that quantifiable data are obtained and statistical analysis used to determine any casual relationships.

CHAPTER 4: METHODOLOGY

4.1 Objectives and specific hypotheses of the study

The goals of this study were to explore if an intervention programme would improve pupils behaviour regulatory skills as measured by a standardised questionnaire. The theoretical rationale was derived from cognitive neuropsychology, specifically that pre-frontal neural development in the pre-frontal cortex enables the development of EFS. One aspect of these skills is a child's ability to develop self-control over their own behaviour. This is achieved through the emergence of such skills as response inhibition, emotional control and shift. (Shift is the ability to change from one activity to another.) These skills are essential classroom skills that all learners need to possess.

In the study there were two groups: the experimental group and control group. The pupils in both could be expected to improve as a result of time allowing maturation to occur. However, the experimental condition which received the intervention programme could be expected to show greater improvement in behaviour regulatory skills when compared to the control group.

4.2 Ethical considerations

Any psychological investigation involves ethical issues. Ethically appropriate procedures were adhered to during this study, which was approved by Cardiff University's School of Psychology Ethics Committee prior to data collection. The British Psychological Society guidelines (2009) regarding ethical standards expected when conducting psychological research were complied with. Further details concerning actions taken to comply with specific guidelines are detailed in Appendix A.

In a study such as this there is a need not just for evidence-based practice but also practice-based evidence. That is evidence that is obtained not in an artificial lab setting but which is trialed in a real world setting (Dozois, 2013).

The design of having a control and experimental group raises ethical issues. If the intervention is successful then the control group has been excluded from receiving its benefits. At this stage the effect of the intervention is unknown, therefore it is ethically appropriate for there to be a control group. In effect the control group can be considered a wait control group. That is if the intervention is successful this group will also receive the

intervention. There is a moral imperative to continue the intervention, if successful, with the control group.

4.3 Design

Any experimental design aims to rule out as many alternative explanations for the obtained results other than the experimental hypothesis. When studies are carried out in the natural environment, control of all variables is rarely achievable. As a result, for the experimental hypothesis to be rigorously tested, careful consideration must be given to the most suitable design. In reality researchers use what can best be described as 'compromise designs' (Kerlinger, 1970). This is because the random selection or assignment, in a school context, is usually beyond the control of the researcher.

This study used a common quasi-experimental design, having an experimental and a control group. This was preferred to the one group pretest - post-test design. The more similar the experimental and control groups are the easier it is to avoid the challenge of extraneous variables that could invalidate any findings, positive or negative. This study investigated a possible causal relationship between independent and dependent variables. The independent variables were the intervention activity pack and time, and the dependent variable was the Behaviour Regulation Index (BRI).

A prospective mixed subject design was used. That is the intervention was applied to one group and then the future outcome was assessed. This contrasts to a retrospective study where the causes of an effect are looked for backward in time. The dependent variable, Behaviour Regulation Index (BRI) was assessed by the class teachers using the Behaviour Rating Inventory of Executive Function (BRIEF) a standardised measure. The BRIEF contains a BRI which was used as the dependent variable.

The intervention programme is presented to the experimental group. Its effects were investigated to determine if the intervention programme had an immediate causal effect. The intervention was both a discrete and immediate factor.

This study investigated whether BRI, the dependent variable, could be advanced through a

targeted set of whole class interventions. In addition, the design enabled any interaction effect of an additional variable, namely time, to be considered.

To summarise, the study had a longitudinal prospective with two assessment moments. Assessment at Time 1 was at the start, with both experimental and control group being assessed by their teachers. Assessment at Time 2 was the same series of tests made eight weeks later, after the experimental group had undertaken the intervention programme.

4.4 Materials

4.4.1 Quantitative measurement of behavioural regulation

Through brain maturation, neurological entities give rise to behavioural phenomena. EFS is a general concept, not an entity, and it is not measured directly, but only by using an instrument (Rosier, 2000). The instrument employed in this study is the Behaviour Rating Inventory of Executive Functioning Skills (BRIEF) produced by Gioia, Isquith, Guy and Kenworthy in 2000. This is an 86-item rating scale for parents and teachers of school age children, 5 -18 years of age. It assesses EFS in the home and school context. EFS is an umbrella term that encompasses a collection of processes that are seen to be responsible for “guiding, directing and managing cognitive, emotional and behavioural function” (Gioia et al., 2000 P 1). It contains eight theoretically and empirically supported clinical sub-scales which measure different aspects of EFS. These, in turn, form two broader indices: Behaviour Regulation Index (BRI), made up from three sub scales, and Metacognition, made up from the remaining five. It is the sub-scales for BRI that this study employs (see Appendix B and B1.).

On the Behaviour regulation index and the related sub scales the mean score is 50, and the average t-score range is 41-59. t- scores at, or above, 65 on any of the scales or indices indicates clinical significance, suggesting EFS dysfunction. The BRIEF manual details good internal consistency as well as reliability on all teacher-rated scales ($p > 0.8$).

4.4.1.1 Rater consistency.

The BRIEF includes a rater consistency scale to check for consistency in answering the questions. (See Appendix C.) The absolute value of the difference in ratings on ten item

pairs are computed. For example, the difference in a rater's scores on the following two questions would be calculated for the paired items.

Leaves work incomplete	N	S	O
Has trouble finishing tasks	N	S	O

The lesser number is subtracted from the greater number. The differences are summed for each subject. The mean is found for the group. Scores equal to or less than 7 are considered acceptable in terms of reliability. The BRIEF manual considers a score larger than eight per assessment indicative of a high degree of inconsistency.

4.5 Intervention programme

The emerging evidence from cognitive neuroscience reviewed above, indicates a potential for improving children's EFS. The evidence clearly links EFS to the neural circuitry of the pre-frontal cortex which in turn is manifested in a child's ability for emotional and behavioural regulation (McCloskey, Perkins, & Van Divner 2009). Research that links specific intervention practices to specific EFS as observed by neural changes in the pre-frontal cortex is not yet experimentally achievable. However effective evidence-based interventions for children who exhibit EFS deficits exist. For example *Cognitive Behavioural Therapy* while not designed to specifically improve EFS has been shown to increase an individual's ability to access the pre-frontal cortex self-directing neural mechanisms (Schwartz, 1996; Goldberg, 2001). Also Berkeley (2006) has developed interventions to improve the EFS of individuals with ADHD. At this stage of understanding cognitive neuroscience-informed planning can advise the choice of interventions to improve children's EFS. Studies at this stage are at the correlational level of understanding.

It is important to stress that any effect of the interventions will result in changes in the BRIEF scores obtained after the intervention programme. Arguing that changes have simultaneously occurred in underlying neural pathways is essentially a theoretical proposition rather than an empirically proven one.

While language ability is nascent at birth, but the spoken language depends on the

environmental context, similarly EFS can be influenced through many different contextual factors. The consequence is different interventions can be used to develop the same EFS.

A multi-faceted programme was designed by the researcher to strengthen the self-regulatory skills measured by the BRIEF. Information from the review (Frederickson et al., 2013) combined with the author's casework experience as a Local Education Authority school EP for fourteen years, indicated the common behavioural difficulties that class teachers reported. Often it was low-level disruptive behaviours that occurred despite sanctions being applied. For example being off task, distractibility, impulsiveness and shouting out.

The emerging evidence from cognitive neuro-psychology suggested the feasibility of strengthening those pre-frontal neural pathways that are actively involved in enabling pupils to control their own behaviour. Interventions were selected which could be expected to increase pupils' response inhibition, emotional control and shift, the ability to change activities, as measured on the BRIEF questionnaire. A summary of the intervention programme is presented next. The materials used are presented in Appendix D.

4.5.1 Programme materials

A Inhibit

Description

The ability to resist or not act on an impulse. The skill to think before acting.

Activities. Paired and individual working.

A1. Reading colour words, The Stroop Effect.

A2. Problem-solving using Turn Turtle technique - the skill to stop and think.

A3. Agreeing classroom routines, for example answering questions and
Asking for help.

A4. Self-monitoring - recording successes and weaknesses

A5. Listen, share, check. Paired activity.

A6. Exploring strength words on cards.

B Emotional Control

Description

The ability to control emotional responses in order to complete tasks at hand.

Activities. Paired and individual working.

B1. Relaxation techniques, breathing, guided imagery.

B2. Self-talk strategies.

B3. Normalising worry – ‘the worry hill,’

B4. Remembering past successes - what went well, what helped you to succeed.

B5. Reading positive stories - for example “The Little Engine that Could.”

B6. Exploring strength words on cards.

C Shift

Description

One key aspect of shift is problem solving flexibility. Some children can repeatedly use the same strategy despite evidence that it is not working.

Activities. Paired and individual working.

C1. Finding different ways to use specific objects eg brick, paper clip.

C2. Using words with multiple meanings, ambiguous sentences.

C3. Self-talk when things are difficult..

C4. Recognising ambiguous figures and visual illusions.

C5. Working with mazes.

C6. Exploring strength words on cards.

Each session was made up of at least two activities from each of the three BRI components.

This ensured variety as well as equal coverage of each component. (See Table 1 on following page.)

4. 5. 2 Session protocols

Each session, which lasted 50 minutes, was introduced to the class as an opportunity to practice skills that would be of value to them in school. The class teacher sat in on each session. The pace was unhurried, allowing pupils to ask questions or for support when

completing a task. The materials used were either presented via a projector or by work sheets.

The visual illusions were discussed by the pupils in pairs. Support was provided to ensure that all pupils could see the various ambiguous and hidden figures.

Sheets were provided for the pupils to work together on specific strength words to expand the meaning of each word. Similarly pupils worked together on sentences with ambiguous meanings

The mazes were of a range of difficulty and were completed individually.

Relaxation techniques were taught as a whole class, with pupils practicing breathing, shallow and deep, and muscle tensing activities.

The Stroop test was undertaken as a whole class, with several practices each session.

The Turn Turtle Techniques was shown to the class via the projector and used in several sessions to develop understanding and mastery.

Pupils agreed at the end of each session the skill they intended practicing and this was reviewed in pairs at the beginning of each session.

The Pupil debrief form (Appendix L2) was handed out and questions taken at the end of the final session. See Appendix E for example session

Table 1: Summarises the activities used in each session

	INHIBIT activities	EMOTIONAL CONTROL activities	SHIFT activities
	A1 A2 A3 A4 A5 A6	B1 B2 B3 B4 B5 B6	C1 C2 C3 C4 C5 C6
Session 1	A1 & A6	B1 & B6	C1 & C6
Session 2	A2 & A5	B2 & B5	C2 & C5
Session 3	A3 & A4	B3 & B4	C3 & C4
Session 4	A4 & A6	B1 & B6	C1 & C6
Session 5	A5 & A1	B2 & B5	C2 & C5
Session 6	A6 & A4	B3 & B4	C3 & C4
Session 7	A1 & A6	B1 & B6	C1 & C46
Session 8	A2 & A5	B2 & B45	C2 & C5

4.6 School and participants

4.6.1 School selection

The primary school selected served a socially diverse catchment area in the south west of England. It had some 720 children on the school role. It had, at the time of the study, earned three ‘outstanding’ Ofsted consecutively and was designated by the DfE and National College for School leadership a National Teaching School and national Support School. The school, had twenty one classes, three of which were Reception classes. Relevant to this study were three year six classes.

For the purpose of the current research project, inclusion and exclusion criteria for the school and the participants selected are described below.

4.6.1.1 School inclusion criteria

The school chosen was a mainstream primary school. This was a government maintained school which provided the education of compulsory school age within their locality. A large primary school was needed to increase the likelihood that any classes chosen for the study would contain pupils with a range of educational abilities. Special schools were not considered as the study was concerned with developing specific behavioural skills for pupils in a mainstream setting.

4.7 Participant inclusion and exclusion criteria

The nature of the design necessitated at least two classes that were comparable with respect to behavior, cultural comparison, age, gender balance and educational level. The school had three year six classes that met these criteria.

If a pupil missed two or more sessions, he or she was allowed to complete the sessions, but their data was not included in the statistical analysis.

4.8 Sample characteristics

The groups were similar in age (experimental group $M = 10.75$ years, $SD = 6.55$ years, $N = 29$, control group $M = 10.75$ years, $SD = 6.91$, $N = 31$).

See Fig. 2 Gender comparison

Control Group by Gender

Girl = green 41.94%

Boy = blue 58.06%

Experimental Group by Gender

Girl = green 48.28%

Boy = blue 51.72%

Figure 1: Gender comparison



The two groups were compared regarding gender ($\chi^2 1,60$ p = .796) There was no significant difference concerning the number of boys or girls in either group.

Table 2: Gender frequencies

		Control	Experimental
Boy	Count	18	15
	Expected count	55.16%	45.45%
Girl	Count	13	14
	Expected count	48.12%	51.85%
Total	Count	31	29

The teachers provided data on the age of pupils with additional needs. Table 3 describes the number of children in each class who were categorised as having Special Educational Needs. Children who are on School action receive in-school support for their learning, behavioural or physical/sensory needs. Those on School Action plus, in addition to school support, are

also receiving support from outside agencies, such as speech therapists. Those who have more complex needs that a school is unable to meet have been formally assessed and now have a statement of their special educational needs that details precisely their needs and the support required to meet them. Schools are usually allocated additional resources to enable them to actively support a child who has a statement of SEN.

Table 3: Experimental and control group SEN characteristics

Children with Additional Needs		
	Experimental Group (A)	Control Group (B)
Statement of S.E.N.	2	1
School action	4	3
School action plus	2	1

The teachers provided data on school assessments data on reading, writing and numeracy Table 3 describes the teacher assessment data. The school uses optional SATs tests which produces a National Curriculum level in Reading, Writing and Numeracy (See Appendix F for raw scores).

Table 4: School assessment scores

Independent Samples Test					
	Experimental group (A)		Control group (B)		
	(N = 29)		(N = 31)		
	M	SD	M	SD	t
Reading	4.48	0.83	4.55	0.81	0.31*
Writing	4.21	0.73	4.26	0.58	0.304 **
Maths	4.3	0.71	4.49	0.72	0.935***

M = Mean, SD = Standard Deviation

* $p > 0.05$ ** $p > 0.05$ *** $p > 0.05$

The criteria for inferential statistics were met as the data was measured at interval level. These results show no academic difference between the experimental and control group on the school assessment of reading, numeracy and writing.

4.9 Procedures

The school's Head teacher was approached at the beginning of the summer term and the proposed study discussed. With agreement from the Head teacher, a meeting was held with the class teachers of the three year six classes. The three classes were randomly allocated to either the pilot group, experimental or control. This was achieved through an independent

person choosing different coloured balls from a secured bag.

Each class could be expected to contain pupils whose BRI varied as a natural result of maturity. As the literature review has already shown, behaviour regulation is a variable feature of normal development. The classes also had similar numbers of boys and girls. In addition, as the classes were randomly constructed at school intake time they were intended, by the school, to be comparable on such variables as ability and SEN.

The study was undertaken in the latter half of the school summer term. The teachers of the experimental and control group assessed and recorded each pupil before (T1) and after (T2) the study was completed on the BRIEF questionnaire.

4.9.1 Anonymity

Participants were fully informed of the project aims and procedures by the researcher before giving their written consent to their class teacher. All participants were informed that any data obtained would be confidential, anonymised and stored securely. All participants were informed that they could withdraw from the project at anytime, view any information held on them and ask for it to be deleted.

The researcher transcribed the data supplied by the teachers. Names of participants, home details, teachers and places were all deleted from any information obtained to maintain anonymity and was anonymised within a day of collection.

The anonymity of respondents was ensured through each class being coded as, Exp. or Cont. Within each class, pupils were allocated a subject rating and their gender was noted. To ensure that data collected at the start of the project and at the end were allocated to the same subject, teachers had a record sheet to match a pupil's name to their group. For example, a boy in the experimental group, being assessed before the intervention, would have a classification of S1Exp(B)T1.

The questionnaires were stored in a locked cupboard and as the raw data is anonymous can be kept indefinitely for future reference.

Concerns regarding possible distress of the participants were proactively addressed and a named teacher was allocated to each class to ensure sensitive support if needed.

The contact details of the researcher and his supervisor were provided on the consent and debriefing forms to the year six participants, class teachers and home. Details of Cardiff University Ethics Committee were provided on all information provided, pre and post data collection, with contact information in case of complaints. In keeping with University data collection guidelines, no information held by the university or researcher could be related back to identify a particular individual.

Details of the specific procedures employed to carry out the study are presented below in chronological order and presented as six stages:

4.9.2 Stage 1: Gatekeeper letters, information and consent letters

Following approval from Cardiff University's School of Psychology Ethics Committee a letter was sent to the Head teacher of the school

Gatekeeper letters (See Appendix G)

Information and consent letters (See Appendix G)

With consent for the study to take place given by the Head teacher, the appropriate information and consent letters were sent to the relevant participants and carers.

Teacher information form

Teacher consent form

Pupil Information and opt out form

Pupil consent form

Home Information and opt out forms (See Appendix H)

(Two children were withdrawn from the study by their parents/carers from the pilot group and one from the experimental group.)

4.9.3 Stage 2: Pilot Group

A Year Six class was used as a pilot group consisting of 28 children: mean age of 10 years 6 months. The group received a forty minute session with a range of activities from the activity pack. This enabled an assessment to be made as to whether the research protocol was feasible. Questions such as , “Are the instructions clear and the activities interesting?” were able to be answered. As De Vaus (1993: P. 54) puts it, “Do not take the risk. Pilot first.” The feedback from both the class teacher and the pupils indicated that the instructions and activities were fully understood by all involved.

4.9.4 Stage 3: Data Collection at Time 1 (T1)

Assessment of experimental and control groups

The assessment of all pupils in the experimental and control groups was made through the respective class teachers completing the questions contained in the BRIEF that related to the Behaviour Regulation Index (BRI). The data was collected and securely stored by the researcher for later analysis (see Appendix I).

Rater consistency

Scores equal to or less than 7 are considered acceptable in terms of reliability. The BRIEF manual considers a score larger than eight per assessment indicative of a high degree of inconsistency (see Appendix J for raw scores).

Table 5: Rater consistency scores

Mean inconsistency score for experimental group	Protocol classification
3.6	Acceptable
Mean inconsistency score for control group	Protocol classification
4.2	Acceptable

4.9.5 Stage 4: Intervention programme

The experimental group received six consecutive weekly sessions of some thirty minutes per session. Each week the programme was delivered as presented above in the Intervention Programme. At the end of each session pupils rated their enjoyment of the session on a 7 point scale. (Appendix K)

4.9.6 Stage 5: Data Collection at Time 2 (T2)

Two weeks after the intervention sessions, both teachers re-assessed each pupil using the BRIEF questionnaire. Data obtained was recorded as T2.

4.9.7 Stage 6: Debriefing information (See Appendix L)

Everyone involved in the project received were thanked. Information concerning the aim of the project and how it was studied was also explained.

Head teacher debrief form (Appendix L1)

Pupil debrief form (Appendix L2)

Class teacher debrief form (Appendix L3)

Home debrief form (Appendix L4)

On account of the potential benefits of the interventions delivered to the experimental group, it was agreed that at the end of the study the teachers of all the classes would be given access to the same materials to deliver to their classes.

4. 10 Results

Descriptive Statistics

Pupil Evaluation

The mean pupil rating of enjoyment over the six sessions was 5.7 as measured on the seven point scale (see Appendix M). The maximum obtainable mean score was 7. Absenteeism from the sessions 5.2%.

Teacher Interview

A post intervention interview with the class teacher of the experimental group indicated:

- pupils had enjoyed and engaged with the set activities
- variety in each session had helped to maintain motivation and attention
- improved behaviour had been observed in a number of pupils who had been perceived to have had definite behavioural difficulties

4.11 Statistical analysis

Primary data analysed was undertaken using SPSS, v. 20.0. After preliminary assumption checking which established the suitability of the data for parametric statistical analysis, similarity between the standard deviation scores between the two groups were compared and confirmed. Without equivalence between the groups, matching is insecure as well as the increased likelihood of regression effects. (A tendency, for example, for scores taken later on a test to move closer towards the mean).

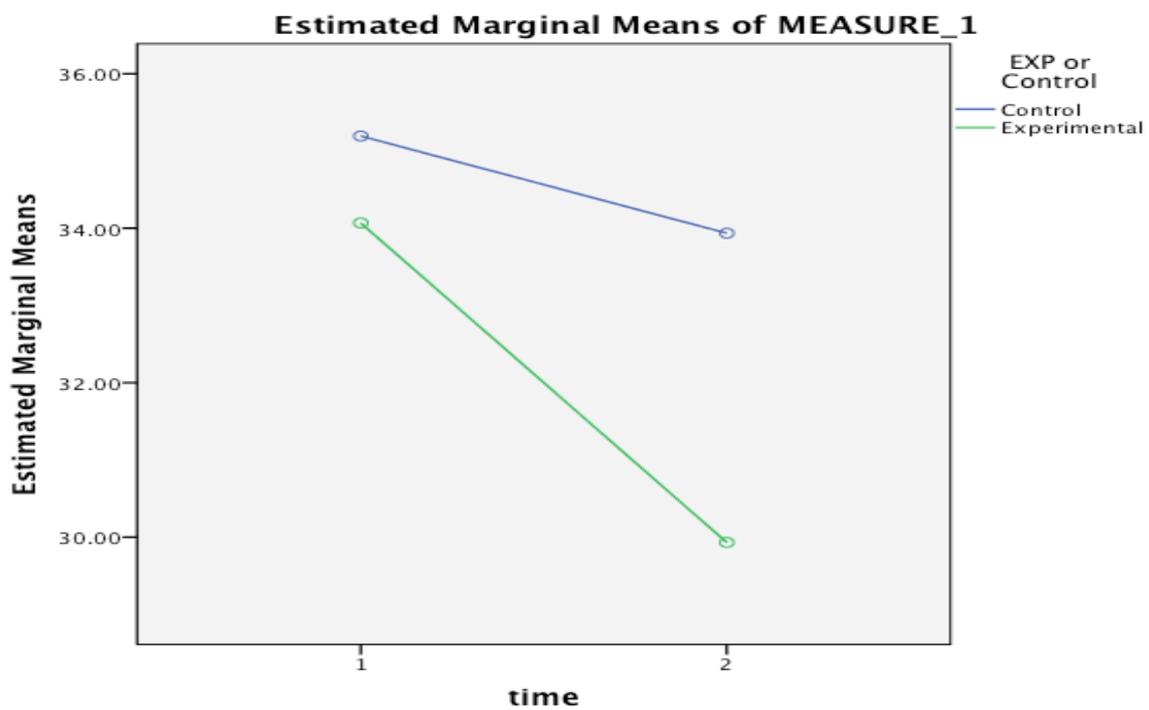
To investigate the first research question, namely whether behaviour regulation (a component of executive functioning skills) showed improvement after a targeted intervention programme. To analyse the main effects of the group conditions (between subject variable) a repeated ANOVA was conducted. The scores at T1 and T2 for the experimental and control group were compared.

Table 6 presents the mean and standard deviation scores for experimental and control group (N = 60) at T1 and T2 as obtained on the BRIEF questionnaire.

Table 6: BRIEF scores at T1 and T2

	Experimental		Control	
	N = 29		N = 31	
	Mean	SD	Mean	SD
T1	34.07	8.38	35.19	9.63
T2	29.93	2.03	33.94	7.83

Figure 2: Mean scores for experimental and control groups at start and finish of the study.



4.11.1 Main effects

To investigate the first research question, namely whether behaviour regulation (a component of executive functioning skills) showed improvement after a targeted intervention programme. To analyse the main effects of the group conditions (between subject variable) a repeated ANOVA was conducted. The scores at T1 and T2 for the experimental and control group were compared.

The effect of the intervention programme was not statistically significant: $F(2,005)$, $p = 0.162$, partial $\eta^2 = 0.033$.

4.11.2 Interaction effects

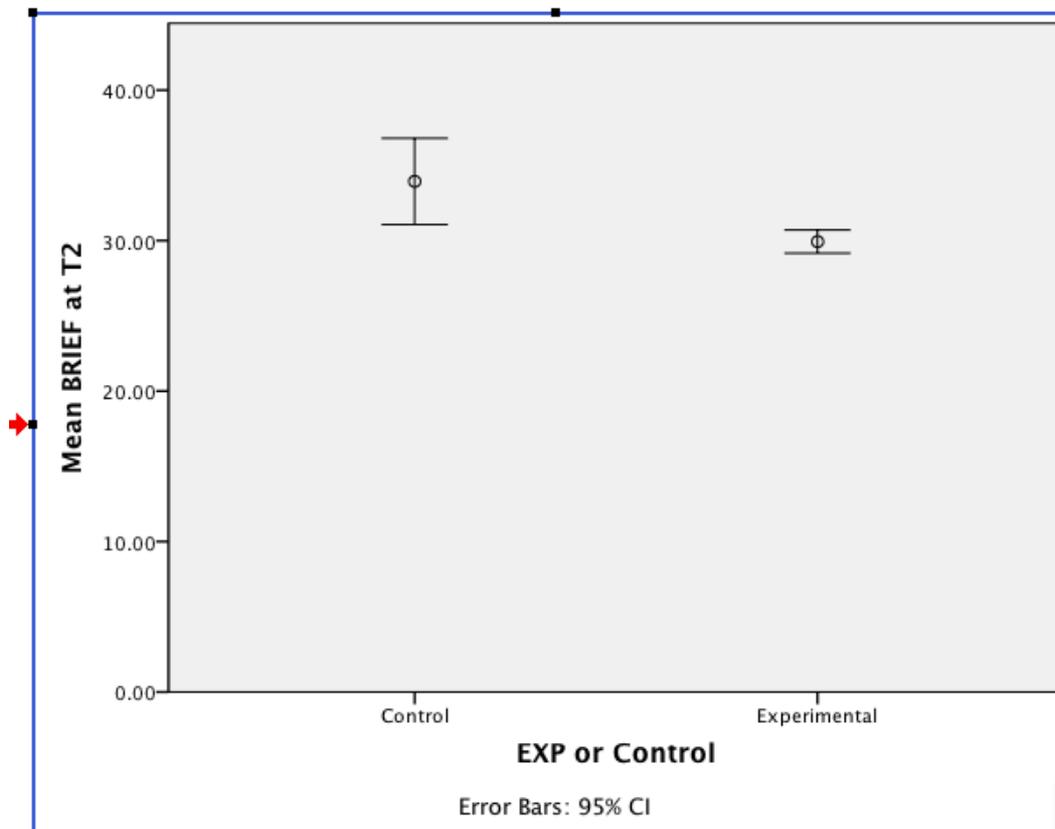
When a research design involves at least two independent factors, there is more to consider than just the main effect. If a significant interaction is found this would mean that changes across time were different for the experimental and control groups, indicating that the intervention is effective.

To investigate the second research question, namely whether standardised scores on a measure of behaviour regulation show improvement as a result of time allowing for increased maturation, a continuous variable. If a significant interaction is found it would indicate that changes across time were different for the experimental and control groups. This is what would be expected if the intervention was effective.

To analyse the effect of time in the two group conditions (a within subject variable) a repeated ANOVA was conducted. The scores at T1 and T2 for the experimental and control group were compared.

In Figure 4 there is a small degree of overlap between the two bars for the groups. This may be explained by an interaction effect between the intervention and time.

Figure 4: Interaction effect of intervention and time



The second research question was to determine if time had interacted with the group effect to any significant degree (a within subject variable).

$F(3.594) p= 0.063$, partial $\eta^2= 0.058$.

While nearing significance, the result is not to the generally accepted level of $P < 0.05$.

Data: Directions not Destinations

$P < 0.05$ is seen by some scientists as been over-emphasised (Hubbard and Armstrong, 2005: Field, 2013). Arguing that it has become an end in itself. The fundamental aim of science is to increase understanding, consequently statistics can usefully be seen as indicating a direction and not solely a destination.

4.11.3 Ancillary Analysis

Table 7: Comparison of boys scores in experimental and control group

Experimental group		Control group	
Participant ID	BR Diff	Participant ID	BR DIFF
101	-13	302	-3
102	-3	303	-5
103	-2	305	-10
104	-9	306	00
107	-5	308	00
116	-2	309	00
119	-2	310	-4
120	00	312	-1
121	-6	314	00
122	-3	315	8
124	00	316	3
125	-27	317	00
126	-4	320	00
127	-10	324	13
129	-20	325	-1
		326	-1
		330	00
		331	00

To investigate a difference between boys in the experimental and the control group an independent t test was conducted on the BR DIFF scores for each condition.

The difference between the boys in each group was statistically significant: $F(4.107)$, $p = 0.003$.

Exploratory investigation of the data at a descriptive level indicated the following patterns.

Brief Score Change

The frequency of change for any score is shown in Table 7. It shows that of the 29 subjects in the experimental condition, 13 (44.8%) did not change their score after the programme intervention. **Table 8: Experimental group scores frequency of change**

Brief_score change					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-27.00	1	3.0	3.4	3.4
	-20.00	1	3.0	3.4	6.9
	-13.00	1	3.0	3.4	10.3
	-10.00	2	6.1	6.9	17.2
	-9.00	1	3.0	3.4	20.7
	-6.00	1	3.0	3.4	24.1
	-5.00	1	3.0	3.4	27.6
	-4.00	1	3.0	3.4	31.0
	-3.00	3	9.1	10.3	41.4
	-2.00	3	9.1	10.3	51.7
	-1.00	1	3.0	3.4	55.2
	.00	13	39.4	44.8	100.0
	Total	29	87.9	100.0	
Missing	System	4	12.1		
Total		33	100.0		

Further inspection of the data shows that the 13 pupils who did not change were originally rated by their teacher on the BRIEF questionnaire with a score of 29. That is they had no difficulties in any of the areas. They were considered by their teacher to be already functioning at the maximum level for self-regulation skills. The intervention programme could not have improved on these scores, since they were already at the top of the scale. It is worth analysing the results with such scores were omitted.

Table 9: Consideration of the BR DIFF for scores at T1 over 30

Experimental group			Control group		
Participant ID	BRIEF T1	BR Diff	Participant ID	BRIEF T1	BR DIFF
101	45	-13	301	50	-12
102	32	-3	302	32	-3
103	31	-2	303	47	-5
104	38	-9	304	32	-4
106	32	-3	305	65	-10
107	34	-5	310	34	-4
108	30	-1	312	30	-1
110	40	-10	313	31	-2
116	33	-2	315	40	8
119	31	-2	316	36	3
121	35	-6	317	30	0
122	34	-3	318	32	-3
125	63	-27	321	45	-10
126	33	-4	322	65	-13
127	44	-10	323	38	0
129	56	-20	324	40	13
			325	32	-1
			326	31	-1
			330	37	0

To investigate whether a difference existed between the two conditions an independent t test was conducted on the BR DIFF scores for each condition.

The difference between each group was statistically significant: $F (.441), p = 0.033$.

Gender Balance

Of the thirteen pupils who were rated on the BRIEF with a score of 29 and at the end of the intervention remained the same, ten were girls (76.9%).

Chapter 5 DISCUSSION AND CONCLUSION

This chapter will consider the implications of the results with respect to both relevant theory and current research. This will be followed by a consideration of the strengths and weaknesses of the study. Finally implications for future research and practising EPs will be explored.

5.1 The findings

Thomas Edison is credited with saying, “I haven’t failed. I’ve found 1,000 ways that don’t work” (as cited in Mroz, 2014). The results of this study do not support the primary hypothesis that self-regulatory behavioural skills could be improved through a whole class intervention programme for year six pupils. The secondary hypothesis that time would interact with the intervention programme, while close to significance, was also rejected.

Ancillary analysis revealed interesting features within the study. Firstly analysis of the BRIEF score changes at T2 for the boys in the experimental and control conditions revealed a significant difference. Indicating that the boys in the experimental condition had certainly improved their behavior as indicated by their teacher’s assessment. Secondly when the scores of pupils with little or no behavioural issues as reflected by their low BRIEF scores were omitted, a significant difference was found between the two groups. This gives strong evidence to the argument that the intervention programme did have some effect on specific learners.

The limited significant findings may have been the result of using year 6 students who had already developed, naturally, their EFSs. Further studies could usefully use either year 5 or 4. It is important to note that by year 6 many pupils way of thinking can be assumed to be at Piaget’s Stage of *formal operational* thought (Pound, 2014). While this is a period when there is an increase in abstract thinking and EFS, it is a mistake to see EFS as being synonymous with either abstract reasoning or *formal operational* thought (McCloskey, Perkins and Van Divner, 2009).

As will be argued later, the fact that some children benefited from the intervention reinforces the preference for targeted rather than universal whole class interventions to improve behavior.

The fact that the overall results from this study were not statistically significant necessitates examination at several levels. Before examining the design and execution of the study, the validity of the main hypothesis needs consideration.

The literature review established that evidence exists linking cognitive neurological functions to child and adolescent behavioural difficulties. The causal mechanism that is understood to explain this observed link lies in the neural pathways that develop in the prefrontal cortex through maturation.

The fact that a link exists between observed behaviours and underlying neurological structures makes intervention in either of these areas a possibility. The intervention programme developed for this study was inferred from cognitive neuroscience evidence combined with evidence-based practice. For example Humphrey, Kalamouka, Wigelsworth and Lendrum (2010) trialed an intervention programme designed to improve the social, emotional and behavioural well-being of primary school children. The study found that the children who benefitted from the intervention were those who were considered by their teachers to have behavioural and emotional difficulties.

The inferred causal relationship between behaviour and neural pathways would be strengthened if changes in observed behaviour could be shown to reflect a change in neurological structures. However, those studies where improvements in social, emotional and behavioural difficulties are reported, are measured by such instruments as the BRIEF. Any changes observed have been achieved through an intervention programme. Such studies cannot and do not claim that neural structural changes have occurred because behaviour was found to have changed (Frederickson et al 2012). The present stage of understanding is one of suggesting a link between neural structures and observed behaviours. For a causal link to be made, studies will need to show more clearly, for example, how changes produced in surface behaviour are reflected in specific neural changes. However, the rationale for the experimental hypothesis investigated in this study is justified both from cognitive neuropsychology and educational research.

5.2 Data: direction not destination

While not statistically significant the intervention programme did produce a change in the BRI for 55.2% of the experimental group. The change in the BRI scores was consistently in the direction of behavioural improvement. Also, of those who showed no behavioural change, 44.8% were rated by their teacher as ‘never’ having had any degree of behavioural problem as indicated by the BRI scores (a score of 29 being given to learners who had no degree of problem as recorded on the BRIEF). Any change in their behaviour would have shown that their behaviour had deteriorated.

A universally applied programme makes the assumption that it will meet the need of all those who could benefit from it, and have no detrimental effect on those who do not. This is a position that some critics of SEAL would not agree with (Bennett 2013), such critics arguing that universal approaches can have a negative effect on those who did not need the intervention. There was no evidence of that occurring in this study.

An explanation for why the intervention programme failed to produce a significant result is discernible on closer examination of similar, but targeted research (Hughes, Dunn and White, 1998; Frederickson et al 2013). Such studies that have shown that EFS can be improved can be generically classified as being undertaken on specific targeted populations. That is the children who received the intervention programme were assessed as being deficient in EFS. Evidence showing that universally applied intervention programmes can be equally effective is in short supply. While SEAL is such a universally applied programme, as already shown, the evidence for its efficacy is questionable on account of schools legitimately developing their own unique programme, making systematic comparisons difficult (Humphrey, 2013).

This study followed a universal model in applying an intervention programme to a class of children who could be expected to vary on EFS. They were not identified as having specific difficulties in EFS. The non-significant results lend weight to the view that while universally applied interventions can be cost effective, they probably are not necessary for some. Furthermore this study found that certain learners, namely boys, considered by their teacher to have problematic behaviours did improve.

However, this study in no way negates the value of the universal approach. Although it may be the case that in circumstances where classroom behaviour is a serious concern, the more targeted approach is likely to be more effective in achieving long-term gains and justifies further investigation.

The results obtained in the experimental group suggested a gender imbalance. Of the learners who were rated with no problem behaviours at the start and finish of the intervention programme, 76.9% were girls, suggesting that, as a group, girls were least likely to benefit from an intervention programme to improve their self-regulatory behaviour skills. Moreover, as was reported in the literature review, researchers have suggested that boys rather than girls might benefit from interventions targeted at improving their EFS (Wright, 2010). This study lends support to this finding that boys in the experimental condition improved on the BRIEF rating when compared to those in the control group to a statistically significant level. A gender focused study exploring similarities and differences between boys and girls using the BRIEF could increase understanding. Specifically it could explore whether the EFS of girls are significantly more developed than similarly aged boys, and the feasibility of improving such skills. The results in this study suggest that it may be the case.

5.3 Whole class teaching, motivation and the intervention programme

A central aim of this study was to investigate the efficacy of a whole class approach to developing pupils' self-regulatory behaviour skills. Many of the activities in the intervention programme could have been delivered in a competitive manner to increase pupil motivation. Research has long established that when tasks are undertaken in the presence of others, responses differ from what they would be if they were completed in isolation. This psychological process, referred to as social facilitation by its key researcher Zajonc (1966) shows how new variables could be introduced to the study. Confounding variables such as how pupils differed with respect to psychological constructs like inferiority complex, need for achievement and locus of control, would have introduced additional variables that could explain the obtained results.

5.4 Evidence-based education initiatives

This study has adopted a scientific methodology, and has strongly supported the view that an understanding of causal relationships between classroom factors has a significant role to play in supporting pupils' behaviour and learning. Sharples (2013) argued that evidence-based education is “about integrating professional expertise with the best external evidence from research to improve the quality of practice”. Such an approach, though, is not without critics. The often heard call that ‘more research is needed’ is not accepted by all. Furedi (2013), for example, believing that evidence-based education over relies on a medical model, argues that randomised controlled trials (RCTs) will result in educational problems needing a diagnosis and, as a result, interventions to treat it. Furedi goes on to argue that it is wrong and impossible to employ RCTs in such complex environments as classrooms. The language of the hospital, treatments and interventions, are seen to be at odds with education. He maintains that children need teaching not healing. Arguably Furedi is confusing evidence based practice with evidence informed practice.

For example, an intervention to enable children with dyslexia to read based on good evidence informed teaching of basic reading skills is highly successful (Solity, 1996). Education produces developmental changes, which in some models would be seen as healing, but evidence informed practice does not depend on specific diagnostically driven analysis. In this study, an intervention programme to increase the control a pupil has over their own behaviour would seem to be an acceptable educational objective for any teacher.

5.5 Changing perspectives

However, the above criticism of ‘evidence-based research’ being a medically dominated method has received support from recent developments. The review to this study detailed the many changing approaches to in-school behaviour as construed by different government-initiated reports. A recent publication contains new implications for how behaviour is to be construed. The SEND code of Practice (DfE, 2014) provides statutory guidance for those working with and supporting children and young people with special educational needs.

Of special relevance to this study is how children and young people with behavioural difficulties are to be categorised. As already detailed in the Review, there had been a significant move away from seeing behaviour as a purely ‘within’ child issue to one that

takes a more ecological view to include wider social factors. Furthermore, behaviour was considered until recently to be on a continuum, with most in-school behavioural issues being manageable and containable at a school level, though with additional support and advice if necessary. The introduction of SEAL at both primary and secondary level was an attempt to enable learners to take control of their own behaviour through being taught core skills.

This study has advocated drawing on cognitive neuropsychology, seeing the behavioural difficulties faced by some children as a matter of poorly developed self-regulatory behaviour skills, which can be negatively affected by many factors. However new guidance proposes a significant change in how schools are to view behavioural issues in the future. The guidance has four areas related to SEN: communication; cognition and learning; social, mental and emotional health; sensory and/or physical impairments. The following quotes from the section concerned with ‘social, mental and emotional health’ highlight the proposed change in perspective.

However, consistent disruptive or withdrawn behaviours can be an indication of unmet SEN, and where there are concerns about behaviour, there should be an assessment to determine whether there are any causal factors such as undiagnosed learning difficulties, difficulties with communication or mental health issues (p. 61).

Under the new guidance the medical classification of childhood disorders will be formally legitimised:

Mental health problems in children and young people

Some children experience a range of emotional and behavioural problems that are outside the normal range for their age or gender. These children and young people could be described as experiencing mental health problems or disorders.

(Mental health and behaviour in schools Departmental advice for school staff. 2014. P. 30).

xxxxxxx

It follows that if children and young people with some degree of behavioural difficulties are to be assessed as to whether or not theirs is a ‘mental’ health issue, then schools:

should have clear arrangements in place with local health partners and other organisations for making appropriate referrals to Child and Adolescent Mental Health Services (CAMHS). This might include schools and colleges commissioning specialist CAMHS directly (p. 64).

Clearly, if a mental health issue is to be investigated then it will need to be undertaken by professionals appropriately qualified. The assessment instruments that will be used are naturally those that are designed to detect mental health issues. It can be expected, then, that many children and young people with some degree of behavioural difficulties will be diagnosed as having some degree of mental health problem.

This is likely to have considerable implications for schools. If a teacher who refers a persistently disruptive pupil is informed, via a report, that the pupil has a mental health difficulty for example, that they have “an under- developed emotional response system combined with callous and instrumental aggression” - the teacher may well expect the medical diagnosticians to make recommendations for the necessary intervention treatment, which the teacher may feel himself / herself to be unqualified to deliver. It is fair to say that some of the implications argued by Furedi (2013) above hold some validity.

The view adhered to here is that EBP is a necessary tool for any educationalist wishing to investigate school-based behavioural issues, which in no way challenges the need to understand the social and cultural factors that shape both a school’s ethos and everyday classroom practices. Complex issues are rarely resolved by a simple choice of one solution over another. To this end it is essential that EPs undertake rigorous, methodologically sound research. In an educational environment that is courted by commercial initiatives that promise to address every educational concern with an off the shelf, one size fits all solution, critical research techniques are essential. For EPs to contribute to the challenges that pupil behaviour causes schools, then educational psychology needs to be a research-based profession (Edwards, 2002).

5.6 Research limitations of the study

While the experimental hypothesis was not supported, negative research findings need to be considered as fully as positive ones. Not to do so is to ignore fundamental principles of the scientific method. Poorly designed experiments do not justify being reported; a negative result derived from a well designed experiment, however, does. Any scientific investigation

is concerned with posterior explanations, that is knowledge that is the result of observations which lead to the deduction of probable causes. Negative research findings need to be presented in the same manner as positive ones and should also be peer reviewed, since reporting negative findings in equal detail can contribute in some meaningful way to knowledge and understanding.

The result of this study raises questions regarding whole class intervention programmes to improve pupils' self-regulatory behaviour. The pupils in the study had different initial BRI profiles at the outset. Many already scored at the upper positive limit on the BRI. These pupils could not improve. Justification for them remaining in the study was on account of findings by SEAL critics suggesting that some pupils' behaviour, on such attributes as concentration, were worse after an intervention programme (Humphrey, 2013). As the intervention programme used in this study had some similarities to the methods used by proponents of SEAL, the inclusion of pupils with such scores was considered valid.

5.6.1 Sampling

A fundamental aim of much scientific research is to be able to generalise any predicted findings from a small study to the parent population. Knowledge is gained through being able to predict how specific variables causally relate to each other. Logically, it is evidence that is contrary to the prediction made that carries more weight than evidence that confirms the expected prediction (Popper, 1959). To make such generally applicable claims it is necessary for the sample studied to fairly reflect the characteristics of the parent population (Field and Hole 2013). There are many different ways of obtaining a random sample, each of which has its own pros and cons (Coolican, 2013). Shadish, Cook and Campbell (2002) suggest key principles that enable scientists to infer causality as follows: (P. 25).

- Surface Similarity. There are obvious similarities between the sample study and the parent population.
- Ruling out irrelevancies. Variables that do not have an effect on the generalisation being made are excluded.
- Making discriminations. Conditions that limit the generalisation are clearly explained.
- Causal Explanations. Theories that seek to explain a causal relationship are tested.

Through the use of a mixed subject design, this study sought to rule out irrelevancies and explore causal relationships between variables. However, the first condition of surface similarity to the parent population is questionable, as will be now considered.

5.6.2 Sample relationship to the parent population

Usually sampling follows one of two methods. Firstly, if every member of a population has an equal chance of being selected, then it is a random sample, also referred to as a probability sample. Secondly, if the chances of members being selected are unknown, then it is a non-probability sample, also known as a purposive sample. In this study, groups of year six primary- aged children were purposively chosen, thereby excluding the possibility of other potential groups being in the study.

For that reason, this study must be considered a pilot study. That is, it is investigating the causal relationship of key variables in a purposively selected group. It satisfies the needs of the study, but, as Cohen, Manion and Morrison (2003) succinctly put it, it “does not pretend to represent the wider population; it is deliberately and unashamedly selective and biased” (P 104). It will, however, enable an argument to be made for the value or not of further investigations.

5.6.3 Bias, demand characteristics and the Hawthorne effect

While this study used a mixed subjects design there was only one source of systematic information for the study, namely the class teachers. Collecting objective data is problematical when the observers need to know the subjects well to be able to complete the questionnaire. This was a prerequisite of the BRIEF questionnaire (Gioia, et al 2000). Teachers are likely to have preconceived ideas and attitudes towards the pupils in their class (Pernell, McIntyre, & Bader, 2001), and they may have an expectation as to how different pupils will respond to the intervention programme, which may compromise the objectivity of the data obtained. The teachers were aware of which class underwent the intervention and which did not. This allows the phenomenon known as ‘demand characteristics’ to influence the data collected. The data collected could reflect the teacher of both groups answering in a way that would confirm the researcher’s expectations. Further in this particular case the teachers knew the researcher, who was familiar with the school and indeed spent six weeks

delivering the intervention. This fact may have biased answers also.

While the control group received no intervention they received the same information as the experimental group. The Hawthorne effect could compromise the results of both pupils and teachers involved. The fact that the pilot group was undertaken in the same school as the main study meant that other pupils could have sensitized pupils to the nature of the study, which influenced their behavior.

Only one school was involved and all assessments were carried out in the same term that the intervention was trialed. As no follow up assessment was undertaken, it is not possible to make a comment as to whether there were any long-term changes.

Future studies could be improved through utilising a double blind design. This would entail some groups receiving placebo type interventions and the class teachers being unaware of which condition their class belonged to. In addition, other measures of classroom behaviour could be used and collected by different people involved with the pupils. This process of triangulation would increase confidence in the data, especially if no inconsistencies between sources occurred.

The integrity of the study was compromised through obtaining student enjoyment data. Any change in behavior as obtained through the teacher's BRIEF assessment could in theory be a result of this. While it was considered to be unobtrusive it could equally act as a confounding variable.

As the intervention was shown to have positive results for the boys in the study the intervention materials were made available to the school in conjunction with support from the researcher.

5.6.4 Measurement issues

There are challenges to the internal validity of the study on account of the measurement instrument employed. While the intervention programme was informed by cognitive neuropsychology, the psychological construct that described the emergent behaviours was EFS.

This was then measured by the BRIEF assessment questionnaire. The questionnaire was administered by the two class teachers. The data obtained is therefore a measure of a teacher's perceptions of executive functions, and there were two teachers. Differences in scores obtained may equally reflect differences in each teacher's perception as much as an objective reflection of the measurement itself.

Therefore, logically, the data obtained may not necessarily be a measure of the actual entity being studied, but is essentially a teacher's perception of a pupil's self-regulatory behaviour skills. If a psychological concept is poorly operationalised then how it is used by different people will ultimately reduce its value and it will be discarded. That is not to say that any differences found are not significant in contributing to our knowledge of these skills as perceived by teachers in a classroom setting.

The academic and educational interest in measuring a range of core skills in children and young people has grown rapidly. Many of the skills that are considered to be EFS are also included in a range of different assessment. For example included are self-regulation, impulsivity, emotional awareness and problem solving. A systematic review of assessment tools by Wigelsworth, Humphrey, Kalambouka and Lendrum (2010) found some twenty four, measuring related psychological constructs. The use of the BRIEF in this study was both necessary and justifiable, but measuring EFS faces the same challenges as those currently attempting to measure children's Social and Emotional Skills: the need for consistency, clarity and agreed operational procedures.

Another important issue and potential weakness in the design is that of culture fairness. The BRIEF was standardized in America on boys and girls between the ages of 5 and 18 years. These children and young people came from a range of racial and socioeconomic backgrounds and different locations, including both city and rural environments. When used in America the test can be argued to have construct validity. However, when used in the United Kingdom an assumption is made that the constructs carry similar meanings between these two cultures. It could be that in the United Kingdom different behaviours are associated with each EFS. Furthermore the samples used in this study were not matched to those that the BRIEF was standardized on (van de Vijver, & Tanzer, 2004).

A threat to the external validity of the results might have been the right of parents to exclude their child from the study. Pupils were also able to exclude themselves. If those who chose not to be in the study were in some way significantly different from those who did take part, then the results would be compromised. However, as only two students were excluded this was not considered an issue in the study.

5.7 Changing role of the EP

The changing role of EPs continues to reflect the changing educational world in which EPs operate. In such complex systems the argument for EPs to function as “practitioner-researcher” seems as strong as ever. As Eodanable and Lauchlan (2009) suggest, EPs need to be aware of new research, undertake and evaluate new interventions which can then be peer reviewed in academic and practitioner journals. Equally important is how EPs can be a role model to school staff. Through actively undertaking research projects in their day to day work they are able to demonstrate to schools the importance of investigating issues in a rigorous and methodical manner. In reality few EPs see research and development as a central feature of their service (Ashton and Roberts, 2006).

5.8 Study value and further research

This study stressed the importance of ‘evidence-based research’ in examining the efficacy of any educational initiatives (Howard-Jones 2010). The debate over the value of SEAL, a key school initiative promoted at Government level, remains a case in point (Humphrey 2013). There remains no “gold standard” measure of SEAL. While the theory behind this study and SEAL differ, there are definite similarities. SEAL is used as a whole class intervention aimed at improving the social, emotional and behavioural aspects of pupil development. The evidence produced from this study questions the value of whole class interventions aimed at improving the self-regulatory behaviour skills in a mainstream primary school. It is worth noting that this was an extremely good main stream primary school who were constantly developing EFS as part of ordinary good classroom and school practice. This could assist in understanding the previously cited findings of Swinson, Woof and Melling (2003) that young people with EBD when re-included into mainstream schools succeeded in well structured classes, but did less well in poorly organized teaching environments.

Essentially there is a debate as to whether it is cost effective to apply an intervention universally, thereby ensuring that all those that need it will receive the intervention, as opposed to the more expensive option of providing the intervention to smaller targeted groups. An advantage is of course that those that are in most need of the support are neither stigmatised nor prioritised. However, the resources required to achieve this can be prohibitive. Both approaches have their detractors and supporters. Given that a not dissimilar intervention was employed with a targeted group of EBD pupils and achieved positive outcomes (Fredrickson et al 2013) and this study, using a universal approach did not, lends some support to the value of the targeted model. Especially given that boys who scored poorly on the BRIEF did seem to benefit.

In-school behaviour requires much more than simplistic solutions. Government-led reminders to schools that they can punish pupils if they behave badly (<https://www.gov.uk/school-discipline-exclusions>), underestimates the complexities of the problem. As already argued, effective classroom behaviour management skills are necessary, but not sufficient. The attitude that teachers can create classrooms where all pupils are equally keen to learn and behave is naive. Cognitive neuropsychology is able to show how brain development is directly linked to a child's social and cultural experiences (Jensen, 2009). The challenge faced by both academics and practitioners is to inform politicians of all parties that schools accept many learners who do not arrive with the necessary pre-requisite skills to be successful learners (Haydn, 2012). Any government holding schools and teachers entirely responsible for poor behaviour will engender a negative working relationship with the teaching profession. Schools seem to be expected to solve problems that it had no part in making or have any direct control over.

The findings in this study suggest that EPs could invest research time into targeted behaviour intervention programmes, clarifying, in the first instance which assessment tools can best identify those pupils who would benefit. An investigation could be made to determine which activities are most likely to improve a pupil's self-regulation. Combined with this would be the need to investigate the best age for enhancing such a skill. Furthermore, the examination of gender similarities and differences is essential in order to clarify whether some activities are more effective for boys than girls, and whether a matter of gender neutral activities are

equally valid.

Our understanding of the behaviour of children and young people is ever growing through the contribution of cognitive neuropsychology. EPs are ideally placed to objectively investigate the usefulness of educational interventions based on neurological research. If new ideas and products based on cognitive neuropsychology are not critically tested, then teachers and pupils are likely to suffer “neuromyths”. As Howard-Jones (2010) explains, much of what teachers are encouraged to use as brain-based teaching “is promoted in very dubious pseudo-scientific terms and we still don’t really know how, and even if, it works.” Supporting this view, Bishop (2014) writes of the “neuro-garbage” that exists in the education market. There is also a tendency for governments to be impressed by brain based findings, to the extent that the present UK government is providing some six million pounds to fund neuroscience research into the effectiveness of neuroscience-based educational interventions (Wellcome Trust and Education Endowment Foundation, 2014).

As previously explained the findings indicated that the intervention programme had positive impact on the ability of some pupils to self-regulate their behaviour. Tentative suggestions are given for future studies focussing on EFS and gender differences as well as early assessments to determine learners who might best benefit from targeted as opposed to universal support, to develop or strengthen their EFS.

If psychology is to be “given away” (Miller, 1969) and used to achieve changes in classroom behaviour (Leadbetter, Morris, Timmins, Knight and Traxon, 1999), then systematic knowledge of intervention efficacy is essential for practising EPs. There is a complex relationship between biology, behavior, context and child and adolescent development. As governments continue to be actively involved with in-school behaviour, any policy that is based on good scientific evidence will be more robust in facing its critics. EPs can and should be in the vanguard of those professionals carrying out such research.

REFERENCES

- Achenbach, T. (1991). *Manual for the Child Behaviour Checklist and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.
- Adele, D., Barnett, W. S., Thomas, J., & Munro, S. (2007). Preschool Program Improves Cognitive Control. *Science*, 318,(5855), 1387-1388.
- Adorno, T. W., & Bernstein, J. M. (2001). *The Culture Industry: Selected Essays on Mass Culture* London: Routledge.
- Albano, A. M. & Kendall, P. C. (2002). Cognitive behavioural therapy for children and adolescents with anxiety disorders: clinical research advances. *International Review of Psychiatry*, Vol. 14, No. 2 , Pages 129-134.
- Read More: <http://informahealthcare.com/doi/abs/10.1080/09540260220132644>
- Read More: <http://informahealthcare.com/doi/abs/10.1080/09540260220132644>
- Algozinne, B., Daunic, A., & Smith, S. (2010). *Preventing Problem Behaviours*. London: SAGE.
- Algozzine, B., Horner, R. H., Sugai, G., Barrett, S., Dickey, S. R., Eber, L., & Tobin, T. (2010). *Evaluation blueprint for school-wide positive behavior support*. Eugene, OR: National Technical Assistance Center on Positive Behavior Interventions and Support. Retrieved from www.pbis.org
- American Psychological Association. (2011). *Publication Manual of the American Psychological Association*. Washington, DC: American Psychological Association.
- Anderson, A. W., & Gore, J. C. (1997). The physical basis of neuroimaging techniques. *Child and Adolescent Psychiatric Clinics of North America*, 16, 213-264.
- Angelides, P. (2000). A new technique for dealing with behaviour difficulties in Cyprus: the analysis of critical incidents. *European Journal of Special Needs Education*, 15,(1), 55 – 68.
- Apter, B., Arnold, C., & Swinson, J. (2010). A mass observation study of student and teacher behaviour in British primary classrooms. *Educational Psychology in Practice*, 26(2), 151-171.
- Arthur-Kelly, M., Lyons, G., Butterfield, N., & Gordon, C. (2007). *Classroom Management*. Chisbourn CT: Thomson.
- Ashton, R. & Roberts, E. (2006). What is valuable and unique about the educational psychologist? *Educational Psychology in Practice*, 22,(2), 111-123.

- Ashworth, P. (2008). Conceptual foundations of qualitative psychology. In J. A. Smith, (Ed.), *Qualitative psychology: a practical guide to research methods*, (pp. 4-25). London: SAGE.
- Banyard, P., & Flanagan, C. (2011). *Ethical Issues in Psychology*. London: Routledge.
- Barkley, R. (1996). Linkages Between Attention And Executive Functions. In G. R. Lyon, and N. A. Krasnegor, (Eds.). *Attention Memory and Executive Function*, (pp. 307-325). York, Pennsylvania: Paul Brookes Publishing Co.
- Barkley, R. (1997). Behavioural inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin*, 121,(1), 65-94.
- Barkley, R. (1997, 2005). *ADHD and the nature of self-control*. New York: Guilford Press.
- Barkley, R. (2006). *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment*. New York: Guilford Press.
- Barrett, M. (2006). “Like Dynamite Going Off In My Ears”: Using auto-biographical accounts of autism with teaching professionals. *Educational Psychology in Practice*, 22,(2), 95-110.
- Bate, C., & Moss, J. (1997). Towards a Behaviour Curriculum. *Educational Psychology in Practice*, 13,(3), 176-180.
- Batmanghelidj, C. (2007). *Shattered Lives: Children Who Live with Courage and Dignity*. London: Jessica Kingsley Publishers.
- Baumeister, R. F., Brandon, J. S. and Vohs, K. D. (2007). Self-Regulation and the Executive Function: The Self as Controlling Agent. In A. W. Kruglanski and E. T. Higgins. (Eds.). *Social Psychology: Handbook of Basic Principles*, pp. 516-539). New York: Guilford.
- Bennathan, M., & Boxall, M. (1996). *Effective Intervention in Primary Schools: Nurture XXXXXX Groups*. London: Fulton.
- Bennett, T. (2013, August 2). ‘Putting emotional intelligence to the test’. *Times Educational Supplement*, p. 6.
- Berger, M. (2006). Computer assisted clinical assessment. *Child and Adolescent Mental Health*, 1,1(2), 64-75.
- Berliner, D. C. (2002). ‘Educational research: The hardest science of all’, *Educational Researcher*,31, 18-20.

- Bernstein, B. (2003). *Applied Studies Towards a Sociology of Language: 2 (Class, Codes, and Control)*. London: Routledge.
- Bestmann, S., Ruff, C. C., Blankenburg, F., Weiskopf, N., Driver, J., & Rothwell, J. (2008). Mapping causal interregional influences with concurrent TSM-fMRI. *Experimental Brain Research* 191: 383-402. Located at: <http://link.springer.com/article/10.1007/s00221-008-1601-8>
- Bishop, D. (2014, February 28). 'Neuroscience is a no-brainer?' *Times Educational Supplement*, p.12.
- Blair, C. (2002). School-readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, 57, 111-127.
- Blair, K., Umbreit, J., and Bos, C. (1999). Using functional assessment and children's preferences to improve the behavior of young children with behavioural disorders. *Behavioural Disorders*, 24, 151-166.
- Blair, C. and Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self-regulation as a means of preventing school failure. *Development and Psychopathology*, Vol. 20. (3), 899-911.
- Blakemore, S. *School brain workout is 'nonsense'*. Located at <http://schoolsimprovement.net/neuroscientist-claims-school-brain-workout-is-nonsense/>
- Boden, M. (2006). *Mind As Machine: a History of Cognitive Science, (2 volumes)*. Chippenham, Wiltshire: Oxford University Press.
- Booth, J. N., & Boyle, J. E. (2009). The role of inhibitory functioning in children's reading skills. *Educational Psychology in Practice*, 25,(4), 339-350.
- Borkowski, J. G., & Burke, J. E. (1996). Theories, models and measurements of executive functioning: An information processing perspective. In G. R. Lyon, & N. A. Krasnegor. (Eds.). *Attention, memory, and executive function*, (pp. 235-61). Baltimore: Brookes.
- Bowlby, J. (1971, 1975; & 1980). *Attachment and Loss. (Vols. 1, 2, & 3)*. Harmondsworth: Penguin.
- Boyle, J. & MacKay, T. (2007). Evidence of the efficacy of systemic models of practice from a cross sectional survey of schools' satisfaction with their educational psychologists. *Educational Psychology in Practice*, 23, (1), 19-32.
- Brace, N., Kemp, R. & Snelgar, R. (2012). *SPSS for Psychologists*. China: Palgrave, Macmillan.

- Brain Gym, (2011). Located at <http://www.braingym.org/history>
- Braun, V. & Clarke V (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3,(2). pp. 77-101. ISSN 1478-0887 Located at: http://eprints.uwe.ac.uk/11735/2/thematic_analysis_revised....html
- Brocki, K. C., & Bohlin, G. (2004). Executive Functions in children aged 6 to 13: A dimensional and developmental study. *Developmental Neuropsychology*, 26,(2), 571-594.
- Broidy, L. M., Nagin, D. S., Tremblay, R. E., Bates, J. E., Brame, B., & Dodge, K. (2003). Developmental trajectories of childhood disruptive behaviours and adolescent delinquency: a six site, cross national study. *Developmental Psychology*, 39, 222-245.
- Bronfenbrenner, U. (1979) *The Ecology of Human Development*. Cambridge: Harvard University Press.
- Bronowski, J. (1967). *Human and animal languages: To honour Roman Jakobson (Vol. 1)*. The Hague: Mouton & Co.
- Brown, T. (2005). *Attention Deficit Disorder: The Unfocused Mind in Children and Adults*. New Haven: Yale University Press.
- British Psychological Society, (2005). Social, Emotional & Behavioural Difficulties. *Educational & Child Psychology*, 22,(3), 2005.
- British Psychological Society, (2005). *What we do*. Located at <http://www.bps.org.uk/what-we-do/bps/bps>. Accessed on June 1 2013.
- Bryson, J. (2004). *Effective Classroom Management*. Abingdon: Hodder & Stoughton.
- Cains, R. A. (2000). Children Diagnosed ADHD: factors to guide interventions. *Educational Psychology in Practice*, 16,(2), 159-180.
- Canter, L., & Canter, M. (1992). *Assertive Discipline: Positive Management for today's classroom*. USA: Canter & Associates.
- Cameron, R. (1998). School Discipline in the United Kingdom: Promoting classroom Behaviour Which Encourages Effective Teaching and Learning. *School Psychology Review*, V.27 N.1 P. 33-44.
- Cameron, R. J. (2006). Educational Psychology: The distinctive contribution. *Educational Psychology in Practice*, 22,(4), 289-304.

- Carnine, D. & Gersten, R. (2000). The nature and role of research in improving achievement in mathematics. *Journal for Research in Mathematics Education*, 31,(2), 138-143.
- Carr, E. G., McConnachie, G., Carloson, J. I., Kemp, D. C., & Smith, C. E. (1994). *Communication-Based Intervention for Problem Behaviour: A User's Guide for Producing Positive Change*. Baltimore, MD, US: Paul H. Brookes Publishing.
- CASEL. (2007). *How Evidence-based SEL Programmes Work to Produce Greater Student Success in School and Life*. Chicago: CASEL.
- Center for the Developing Child. Executive Function: Skills for Life and Learning. Located at: http://developingchild.harvard.edu/key_concepts/executive_function/
- Clark, C., Prior, M. and Kinsella, G. (2002). The relationship between executive function abilities, adaptive behaviour, and academic achievement in children with externalising behavior. *Journal of Child Psychology and Psychiatry*, Vol. 43, Issue 6, P. 785–796.
- Coch, D., Dawson, G. and Fischer, K. W. (Eds.). (2010). *Human Behavior, Learning, and the Developing Brain*: USA: Guilford Press.
- Cohen, L., Manion, L., & Morrison, K. (2003). *Research Methods in Education*. London: Routledge Falmer.
- Cole, T., Daniels, H., & Visser, J. (Eds.) (2013). Introduction Dilemmas and scope of the Companion. (P.1). *The Routledge International Companion to Emotional and Behavioural Difficulties*. London: Routledge.
- Cole, T., & Knowles, B. (2011). *How to Help Children and Young People With Complex Behavioural Difficulties*. London: Jessica Kingsley Publishers.
- Connors, C. K. (1989). *Manual for Connors' Rating Scales*. North Towanda, NY: Multi-Health Systems.
- Coolican, H. (2013). *Research Methods and Statistics in Psychology*. London: Routledge.
- Cooper, P. and Bilton, K. (1999). (Eds.). *Attention Deficit/hyperactivity Disorder: Research, Opinion and Practice*. London: Whurr Publishers.
- Cooper, P. (1999). Changing Perceptions of EBD: Maladjustment, EBD and Beyond. *Emotional and Behavioural Difficulties*, Vol. 4, (3), 3 -11.
- Cooper-Kahn, J., & Dietzel, L. (2008). *Late, Lost and Unprepared*. USA: Woodbine House.

- Conroy, M. A., and Fox, J. J. (1994). Setting Events and challenging behavior in the classroom: Incorporating contextual factors into effective intervention plans. *Preventing School Failure*, 38, 29-34.
- Cowley, S. <http://headguruteacher.com/2013/01/06behaviour-management-a-bill-Rogers-top-10/>
- Crimmins, D., Farrell, A. F., Smith, P. W., & Bailey, A. (Eds.). (2007). *Positive Strategies for Students with Behavioural Problems*. London: Paul H Brookes.
- Cullen, C., Hattersley, J. & Tennant, L. (1981). Establishing Behaviour: the constructional approach. In Davey, G. (Ed.). *Applications of Conditioning Theory*. London: Methuen.
- Cullinan, D. (2004). Classification and Definition of Emotional and Behavioural Disorders. In Rutherford, R., Magee Quinn, M., & Mathur S. R. (Eds.). *Handbook of Research in Emotional and Behavioural Disorders*. (pp. 32-53). London: The Guilford Press.
- Cullingford, C. (1999). *The Causes of Exclusion*. London: Kogan Paul.
- Curran, A., Gersch, I. S., & Wolfendale, S. (2003). 'Educational psychology', XXXX In R. Bayne, & I. Horton (Eds.), *Applied psychology: Current issues and new XXXXX directions*. (pp. 23 – 37). London: Sage.
- Daniels, A., & Williams, H. (2000). Reducing the need for exclusions and statements for behaviour: The Framework for Intervention. *Educational Psychology in Practice*. 15,(4), 220-227.
- Davies, S., and Witte, R. (2000). Self-management and peer monitoring within a group contingency to decrease uncontrolled verbalisations of children with attention-hyperactivity disorder. *Psychology in the Schools*, 37, 135-147.
- Dawson, P., & Guare, R. (2010). *Smart but Scattered*. London: The Guilford Press.
- Dawson, P., & Guare, R. (2009). *Executive Skills in Children and Adolescents*. London: The Guilford Press.
- Deal, R. (2010). *Strength Cards*. Victoria, Australia: St Luke's Innovative Resources.
- De Bellis, M. D., Keshavan, M. S., Beers, S. R., Hall, J., Frustaci, K., Masalehdan, A., et al (2001). Sex Differences in Brain Maturation during Childhood and Adolescence. *Cerebral Cortex*, 11,(6). P. 552-557.

- Dekker, S., Lee, N. C., Howard-Jones, P., & Jolles, J. (2012). Neuromyths in Education: Prevalence and Predictors of Misconceptions among Teachers. *Frontiers in Psychology*, 3: 429. Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3475349/>
- Denckla, M. B. (1989) "Executive Function, the Overlap Zone between Attention Deficit Hyperactivity Disorder and Learning Disabilities." *International Paediatrics*, 4,(2), 155 - 160.
- Denckla, M. B. (1996). A theory and model of executive function: A neuropsychological perspective. In G. R. Lyon., & N. A. Krasnegor, (Eds.). *Attention, memory, and executive function.* (pp. 263-278). Baltimore: Brookes.
- Denham, A., Hatfield, S., Smethurst, N., Tan, E. and Tribe, C. (2006) The Effect of X XXX Social Skills Interventions in the Primary School. *Educational Psychology in Practice*. 22, (1), 33 – 52.
- Department of Education and Science. (1989). *Discipline in Schools. Report of the Committee of Enquiry Chaired by Lord Elton (the Elton Report)*. London: HMSO.
- Department for Education. (1994a). *Pupil Behaviour and Discipline. Circular 8/94*. London: DFE.
- Department for Education (1994b). *The Education of Children with Emotional and Behavioural Difficulties*, Circular 9/94. London: Department for Education.
- Department for Education. (1994) *Code of Practice on the Identification and Assessment of Special Educational Needs*. London: Central Office of Information.
- Department for Education and Skills. (2001a). *Special educational needs; Code of practice*. Nottingham: DfEE publications.
- Department for Education and Skills. (2003). *Every Child Matters*. Nottingham: DfES. Publications.
- Department for Education and Skills. (DfES) (2005). *The Report of the Practitioners' Group on School Behaviour and Discipline*. Nottingham: DfES.
- Department for Education and Skills (DfES). (2005). *Primary Social and Emotional Aspects of Learning (SEAL): Guidance for Schools*. Nottingham: DfES Publications.
- Department for Children, Schools and Families. (2007). *Social and Emotional Aspects of Learning (SEAL) Programme: Guidance for Secondary Schools*. Nottingham: DCSF Publications.

Department for Education, (2014). *Mental Health and Behaviour in Schools*. Located at: XXXXXhttps://www.gov.uk/government/uploads/system/uploads/attachment_data/file/326551/Mental_Health_and_Behaviour__Information_and_Tools_for_Schools_final_website__2__25-06-14.pdf

Department for Education and Department of Health. (2014). SEND code of practice: 0 to 25 years. Department for Education Department of Health.

Dessent, T. 1992 Educational psychologists and the 'case for individual casework' . In S Wolfendale, T Bryans, M Fox, A Labram and A Sigston (Eds), *The profession and practice of educational psychology: Future directions* (pp. 34 - 48). London Cassell.

De Vaus, D. A. (1993). *Surveys in Social Research*. London: UCL Press.

Diagnostic and statistical manual of mental disorders (5th Ed.). (2013). Washington, DC: American Psychiatric Association.

Diamond, A. & Goldman-Rakic, P. S. (1989). Comparison of human infants and rhesus monkeys on Piaget's AB task: Evidence for dependence on dorsolateral prefrontal cortex. *Experimental Brain Research*, 74, 24- 40.

Diamond, A., Barnett, W. S., Thomas, J. & Munro, S. (2007). Preschool Program Improves Cognitive Control. *Science*, 317, 1387 - 1388.

DiGiulio, R. (2000). *Positive Classroom Management*. USA: Corwin Press Inc.

Dinkmeyer, D., & Carlson, J. (2006). *Consultation*. London: Routledge.

Division of Educational and Child Psychologists, (2002). *Professional Practice Guidelines*. http://www.bps.org.uk/sites/default/files/documents/professional_practice_guidelines_division_of_educational_and_child_psychology.pdf. Accessed on November 30, 2013.

Division of Educational and Child Psychology. (2002). Professional Practice Guidelines. XXXXX Located at: http://www.bps.org.uk/sites/default/files/documents/professional_practice_guidelines_-_division_of_educational_and_child_psychology.pdf

Dobbing, J. (Ed.). (1997). *Developing Brain and Behaviour*. Bridgend: Academic Press

Dowling, J. & Leibowitz, D. Evaluation of educational psychology services: Past and Present. *Educational Psychology in Practice*, 9,(4), 241 – 250.

Dozois, D. J. (2013). Psychological Treatments: Putting Evidence into Practice and Practice into Evidence. *Canadian Psychology*, 54,(1), 1 - 11.

Duncan, J. (1986). Disorganisation of behavior after frontal lobe damage. *Cognitive Neuropsychology*, 3, 271-290.

- Dunlosky, J. (2003). 'Get Inside Their Heads.' *Times Educational Supplement*, 1st March 2013, p. 28.
- Dunsmuir, S., Brown, E., Iyadurai, S. & Monsen, J. (2009). Evidence-based practice and evaluation: from insight to impact. *Education Psychology in Practice*, 25,(1), 53 - 69.
- Dweck, C. (2000). *Self-theories: Their Role in Motivation, Personality, and Development*. Lillington NC: Taylor & Francis.
- Dweck, C. (2006). *Mindset: How You Can Fulfil Your Potential*. New York: Ballantine Books.
- Educational and Child Psychology. (2005) *Social, Emotional and Behavioural Difficulties.*, 22, (3).
- Edwards, A. (2002). Responsible research: Ways of being a researcher. *British Educational Research Journal*, 28,(2), 157-168.
- Eliot, L. (1999). *What's going on in there?: How the brain and mind develop in the first five years of life*. New York: Bantam.
- Elliott, R. (2003). Executive functions and their disorders. *British Medical Bulletin*, 65 (1): 49-59.
- Ellis, S. & Tod J. (2009). *Behaviour for Learning*. London: Routledge.
- Emerson, E. (1995). *Challenging Behaviour: Analysis and Intervention in People with Learning Difficulties*. Cambridge: Cambridge University Press.
- Emerson, E. & Einfeld, S. L. (2011). *Challenging Behaviour*. Cambridge: Cambridge University Press.
- Eodanable, M. & Lauchlan, F. (2009). The advance of research and evaluation skills by 'XXX EPs: implications for training and professional development. *Educational XXXXXXPsychology in Practice*, 25,(2), 113-124.
- Erickson, F. & Gutierrez, K. (2002). Culture, rigour and science in educational research. *Educational Researcher*, 31, 21-4.
- Evans, J., Harden, A., Thomas, J., & Benefield, P. (2003). Support for pupils with emotional and behavioural difficulties (EBD) in mainstream primary classrooms: a systematic review of the effectiveness of interventions. *Research Evidence in Education Library*. London: EPPI-Centre, Social Science Research Unit, Institute of Education.

- Evertson, C. M., & Weinstein, C. S. (2006). *Handbook of Classroom Management*. London: Routledge.
- Ewing-Cobbs, L., Prasad, M. R., Landry, S. H., Kramer, L. & DeLeon, R. (2004). Executive Functions Following Traumatic Brain Injury in Young Children: A Preliminary Analysis. *Developmental Neuropsychology*, 26, (1), 487-512.
- Fallon, K., Woods, K., & Rooney, S. (2010). A discussion of the developing role of XXXXX educational psychologists within children's services. *Educational Psychology in Practice*, 26, (1), 1-23.
- Fassbender, C., Murphy, K., Foxe, J., Wylie, G., Javitt, D., Robertson, H., & Garavan, H. XXXX (2004). A topography of executive functions and their interactions revealed by XXXXX functional magnetic resonance imaging. *Cognitive Brain Research*, 20,(2), XXXX 132–143.
- Feinberg, T. E., and Farah, M. J., (2003). *Behavioural Neurology and Neuropsychology*. New xxxxx York: McGraw-Hill.
- Feinstein, S. (2004). *Secrets of the Teenage Brain*. USA: The Brian Store.
- Festinger, L. (2012). *When Prophecy Fails*. USA: Start Publishing LLC.
- Feuer, M. J., Towne, L., & Shavelson, R. J. (2002) 'Scientific culture and educational research'. Located at: http://web.stanford.edu/dept/SUSE/SEAL/Reports_Papers/other_papers/Scientific%20Culture_ER.pdf
- Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. London: Sage.
- Field, A. & Hole, G. (2013). *How to Design and Report Experiments*. London: Sage.
- Forsterling, F. (2011). *Attribution: An Introduction to Theories, Research and Applications*. Hove, East Sussex: Psychology Press.
- Fox, M. (2003). Opening Pandora's Box: evidence-based practice for educational psychologists. *Educational Psychology in Practice*, 19,(2), 91-102.
- Fox, M. (2009). Working with systems and thinking systematically - disentangling the XXXX crossed wires. *Educational Psychology in Practice*, 25,(3), 247-258.
- Fox, S.J., Farrell, P., & Davis, P. (2003). *Patterns of support for pupils with learning XXXXXX* British Educational Research Association Annual Conference, Heriot-Watt XXXXXX University, Edinburgh, 11-13 September 2003.
- Frederickson, N., Jones, A. P., Warren, L., Deakes, T. & Allen, G. (2013). Can XXX XXXXXX developmental cognitive neuroscience inform interventions for social, XXXXXXemotional and behavioural difficulties (SEBD)? *Emotional and Behavioural XXXXXXXX Difficulties*, 18,(2), 135-154.

- Frith, U. (2011). Kids behaving badly. Located at <http://www.bps.org.uk/news/kids-XXXXXX behaving-badly>
- Fromm, E. (2005). *The Fear of Freedom*. London: Routledge and Kegan Paul.
- Furedi, F. (2013). Teaching is not some kind of clinical cure. TES 4/10/2013, p. 24.
- Gadamer, H. (1975). *Truth and method*. New York: Seabury Press.
- Gadamer, H. (1975) As cited in L. Wallach, & M. Wallach, (2012). *Seven Views of Mind*, (p. 239). Hove, East Sussex: Psychology Press.
- Gathercole, S. E. and Alloway, T. P. (2012). *Working Memory and Learning*. London: Sage.
- Gathercole, S. E. and Pickering S. J. (2001). Working memory deficits in children with special educational needs. I *British Journal of Special Education*, 28, 89-97.
- Geddes, H. (2006). *Attachment in the Classroom: The links between children's early experience, emotional well-being and performance in school: A Practical Guide for Schools*. Bath: Worth Publishing Ltd.
- Gergen, K. (1994). *Towards transformation in social knowledge*. Thousand Oaks, CA: Sage.
- Gersch, I. (2009). A positive future for educational psychology – if the profession gets it right. *Educational Psychology in Practice*, 25,(1), 9-19.
- Gibbs, S. (2007). Teachers' perceptions of efficacy: Beliefs that may support inclusion or segregation. *Educational and Child Psychology*, 24,(3), 47-53.
- Giddens, A. (1976). *New Rules of Sociological Method: A Positive Critique of Interpretative Sociologies*. London: Hutchinson.
- Giedd, J. A., Snell, J. W., Lange, N., Rajapakse, J. C., Casey, B. J. & Kozuch, P. L. (1996). Quantitative magnetic resonance imaging of human brain development: Ages 4-18. *Cerebral Cortex*, 6, 551-560.
- Gillham, B. (1978). *Reconstructing Educational Psychology*. UK: Croom Helm Ltd.
- Gioia, G. A., Isquith, P.K., Guy, S. C. & Kenworthy, L. (2000). *Behaviour rating inventory of executive function: Professional manual*. Lutz, FL: Psychological Assessment.
- Glasser, EW. (1993). *Control Theory: A New Explanation of How We Control Our Lives*. New York: perennial Library.

- Gogtay, N., Giedd, J.N., Lusk, L., Hayashi, K. M., Greenstein, D., Vaituzis, A. C., Nugent, T. F., Herman, D. H., Clasen, L. S., Toga, A.W., Rapoport, J. L. and Thompson, P. M. (2005). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings of the National Academy of Sciences*, Vol.101, No. 21, 8174-8179.
- Goldberg, E. (2001). *The Executive Brain: Frontal lobes and the civilized mind*. New York: Oxford University Press.
- Goldiamond, I. (1974). Toward a constructional approach to social problems: ethical and constitutional issues raised by applied behaviour analysis. *Behaviourism*, (2), 1-84.
- Golding, K. S., Fain, J., Frost, A., Mills, C., Worrall, H., Roberts, N., Durrant, E. & Templeton, S. (2013). *Observing Children with Attachment Difficulties in School*. London: Jessica Kingsley Publishers.
- Goleman, D. (2013). *Focus: The Hidden Driver of Excellence*. London: Bloomsbury.
- Goodman, R. (2005). *Mental Health of Children and Young People in Great Britain*. XXXX Newport: ONS.
- Graham, S., & Harris, K. R. (1996). Addressing problems in attention, memory and XXXXX executive functioning: An example from self-regulated strategy development. XXX In G. R. Lyon, & N. A. Krasnegor, (Eds.), *Attention, memory, and executive function*, pp. 263-279. Baltimore: Brookes.
- Gravetter, F. J. & Wallnau, L. B. (2007). *Statistics for the Behavioural Sciences*. Toronto, XXXX Canada: Thomson Wadsworth.
- Grafman, J. & Litvan, I. (1999). Importance of deficits in executive functions. *The Lancet*, XXXXX 354, 1921-1923.
- Greco, L. A. & Hayes, S. C. (Eds.). (2008). *Acceptance and Mindfulness Treatments for XXXXX Children and Adolescents: A Practitioner's Guide*. Oakland CA, USA: Context XXXXX Press, New Harbinger Publications, Inc.
- Green, H., McGinnity, A., Meltzer, H., Ford, T. & Goodman, R. (2005). *Mental health of XXXX children and young people in Great Britain, 2004*. Palgrave: Macmillan.
- Greig, A., Minnis, H., Millward, R., Sinclair, C., Kennedy, E., Towlson, et al. (2008). XXXX Relationships and learning: a review and investigation of narrative coherence in XXXX looked-after children in primary school. *Educational Psychology in Practice*, XXXXX 24,(1), 13-27.
- Gresham, F. M. & Elliot, S.N. (2008). *Social Skills Improvement System: Rating Scales Manual*. Minneapolis, MN: Pearson.
- Gross, J. (2013, August 9). 'Emotional intelligence gets the Seal of approval'. *Times Educational Supplement*, p. 6.

- Gross, R. (2010). *Psychology: The Science of Mind and Behaviour*. Dubai: Hodder Education.
- Gunnar, M. R. (1998). Quality of Early Care and Buffering of Neuroendocrine Stress Reactions: Potential Effects on the Developing Human Brain. *Preventive Medicine*, Vol. 27, Issue 2, March 1998, P. 208–211.
- Gus, L. (2000). Autism: promoting peer understanding. *Educational Psychology in Practice*, 16,(4), 461-468.
- Gutkin, T. B., & Reynolds, C. R., (Eds.). (1990). *The Handbook of school psychology*. New York: Wiley.
- Hallam, S., Rhamie, J. & Shaw, J. (2006). *Evaluation of the Primary Behaviour and Attendance Pilot*. London: DES.
- Hamill, P. (2005). The Pupil Support Base in the Scottish Secondary School: An Alternative to Exclusion. In P. Clough, P. Garner, J. Pardeck., & F. Yuen. (Eds.). *Handbook of Emotional and Behavioural Difficulties*, (pp. 354-369). London: Sage.
- Hampson, K. (2010). *Young people with Anti-Social Behaviours: Practical Resources for Professionals*. London: David Fulton/NASEN.
- Hansen, P., Kringelbach, M., & Salmelin, R. Eds. (2010). *MEG: an Introduction to Methods*. New York: Oxford University Press.
- Hargreaves, D., Hester, S. (1975). *Deviance in the Classrooms*. London: Routledge.
- Hart, R. (2010). Classroom behaviour management: educational psychologists' views on effective practice. *Emotional and Behavioural Difficulties*. 15, (4), 323 – 39.
- Hart, T. & Jacobs, H. E. (1993). Rehabilitation and management of behavioural disturbances following frontal lobe injury. *Journal of Head Trauma and Rehabilitation*, 8, 1 - 12.
- Haydn, T. (2012). *Managing Pupil Behaviour: Improving the class*. Tyne and Wear: Routledge.
- Hayes, B., Hindle, S., & Withington, P. (2007). Strategies for Developing Positive Behaviour Management. Teacher Behaviour Outcomes and Attitudes to the Change Process. *Educational Psychology in Practice*, 23,(2), 161 - 175.
- Hayes, S. (2003). *Acceptance and Commitment Therapy*. London: The Guilford Press.
- Hayes, S., Gifford, V., and Ruckstuhl, L. E. (1996). Relational Frame Theory and Executive Function. In G. R. Lyon, and N. A. Krasnegor, (Eds.). *Attention Memory and Executive Function*, (pp. 279-305-). York, Pennsylvania: Paul Brookes Publishing Co.

- Herbert, M. (1981). *Behavioural Treatment of Problem Children*. London: Academic Press.
- Heshushius, L. and Ballard, K. (1996). *From Positivism to Interpretivism and Beyond: Tales of Transformation in Educational and Social Research (The Mind-Body Connection)*. UK: Teachers' College Press.
- Hofman, W., Schmeichel, B. J. and Baddeley, A. D. (2012). Executive functions and self-regulation. *Trends in Cognitive Sciences*, Vol. 16, Issue 3, P. 174–180.
- Holowenko, H. (1999). *Attention Deficit/Hyperactivity Disorder*. London: Jessica Kingsley Publishers.
- Holowenko, H. & Pashute, K. (2000). ADHD in Schools: a survey of prevalence and 'coherence' across a local UK population. *Educational Psychology in Practice*, 1,6(2), 181-190.
- Hopkins, D. (2000). *A Teacher's Guide To Classroom Research*. Buckingham: Open University Press.
- Howard, C. (2013, August 9). *Times Educational Supplement*, Letters, p. 6.
- Howard-Jones, P. (2010). *Introducing Neuroeducational Research*. Abingdon: Routledge.
- Howell, D. (2013). *Statistical Methods for Psychology*. Canada: Wadsworth Cengage Learning.
- Hrekow, P. (2013). Unpublished NUT Course: Getting Behaviour Right.
- Hrekow, P., & Howard, P. (2014). *Getting Behaviour Right*. London: Dreyfus Training XXXX & Development.
- Hubbard, R. and Armstrong, J. S. (2005). *Why We Don't Really Know What "Statistical Significance" Means: A Major Educational Failure*. Located at: XXXX http://repository.upenn.edu/cgi/viewcontent.cgi?article=XXXXX&context=marketing_papers
- Hughes, C. (2002). Executive Functions and Development: Why the Interest? *Infant and Child Development*, 11, 69-71.
- Hughes, J. N., Cavell, T. A. and Willson, V. (2001). Further Support for the Developmental Significance of the Quality of the Teacher–Student Relationship. *Journal of School Psychology*, Vol. 39, Issue 4, P. 289–301.
- Hughes, C., Dunn, J. & White, A. (1998). 'Trick or Treat? Uneven Understandings of Mind, Emotion and Executive Dysfunction in Young "Hard to Manage" Preschoolers', *Journal of Child Psychiatry and Psychology*, 39, 981-94.

- Hughes, D. A. (2006). *Building The Bonds of Attachment*. London: Jason Aronson.
- Humphrey, N. (2013). *Social and Emotional Learning: A Critical Appraisal*. London: Sage Publications.
- Humphrey, N., Kalambouka, A., Wigelsworth, M. & Lendrum, A. (2010). An Evaluation of a Short, Social-Emotional Intervention for Primary School Children. *School Psychology International* , 31,(3), 250-270.
- Humphrey, N., Lendrum, A. & Wigelsworth, M. (2013). Making the most out of school-based prevention: lessons from the social and emotional aspects of learning (SEAL) programme. *Emotional & Behavioural Difficulties*, 18(3), 248 - 260.
- Imich, A. (1999). Delivering educational psychology. *Educational Psychology in Practice*, 15,(1), 57-64.
- Jackson, E., Whitehead, J., & Wigford, A. (2010). In an EBD population do Looked After Children have specific needs relating to resilience, self-perception and attainment? *Educational Psychology in Practice*, 26,(1), 69-77.
- James, W. (2007). *The Principles of Psychology*. New York: Cosimo Classics.
- Jensen, E. (2009). *Teaching with poverty in mind*. USA: ASCD.
- Jensen, E. P. (2008). *Brain-based Learning: The New Paradigm of Teaching*. London: Corwin Press.
- Jones, R. A. (2003). Construction of Emotional and Behavioural Difficulties. *Educational Psychology in Practice*, 19,(2), 147-57.
- Karatoreos, I. N., & McEwen, B. S. (2013). The neurobiology and physiology of resilience and adaptation across the life course. *Journal of Child Psychology and Psychiatry*, 54,(4), 337-347.
- Kelly, G. (1986). In D. Bannister, & F. Fransella. (Eds.). *Inquiring Man: Theory of Personal Constructs*. London: Croom Helm Ltd.
- Kerlinger, F. N. (1970). *Foundations of Behavioural Research*. New York: Holt, Rinehart & Winston.
- Kerns, K. A. Eso, K., & Thomson, J. (1999). Investigations of a direct intervention for improving attention in young children with ADHD. *Developmental Neuropsychology*, 16, 273-295.

- Kimura, D. (1999). Sex Differences in the Brain. *Located at*
<http://www.lscp.net/persons/ramus/fr/GDP1/papers/kimura02.pdf>
- Kishiyama, M. M., Boyce, W. T., Jimenez, A. M., Perry, L. M. & Knight, R. T. (2009). Socioeconomic Disparities Affect Pre-frontal Function in Children. *Journal of Cognitive Neuroscience*, 21,(6), 1106 - 1115.
- Klingberg, T., Fernell, E., Olesen, P. J., Johnson, M., Gustafsson, P., Dahlstrom, K., et al. (2005). Computerised training of working memory in children with ADHD: a randomised, controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44, 177-186.
- Kohn, A. (1993). *Punished by Rewards*. New York: Houghton Mifflin Company.
- Koshy, V. (2005). *Action Research For Improving Practice*. London: Paul Chapman Publishing.
- Kounin, J. S. (1977). *Discipline and Group Management*. New York: Krieger.
- Kratochwill T.R., & Shernoff, E.S. (2003). Evidence-Based Practice: Promoting Evidence-Based Interventions. *School Psychology Quarterly*, 18,(4), 389-408.
- Kratzig, G., & Arbuthnott, K. (2006). Perceptual learning style and learning proficiency: A XXXXXX test of the hypothesis. *Journal of Educational Psychology*, 98, 238-46.
- Langford, P. E. (2005). *Vygotsky's developmental and educational psychology*. Hove & New York: Psychology Press, Taylor and Francis Group.
- Laser, J. A. and Nicotera, N. (2011). *Working with Adolescents*. New York: The Guilford Press.
- Leadbetter, J. (2000). Patterns of service delivery educational psychology services: Some implications for practice. *Educational Psychology in Practice*, 16,(4), 449-460.
- Leadbetter, J., Morris, S., Timmins, P., Knight, G., & Traxon, D. (1999). *Applying Psychology in the Classroom*. London: David Fulton Publishers.
- Learning and Teaching, (2013). http://www.learningandteaching.info/learning/figures_behaviourism.htm. Accessed on February 8, 2013.
- Lewin, K. (1936). *Principles of Topological Psychology*. London: McGraw-Hill Book Company, Inc.
- Lewis, T. J., Lewis-Palmer, T., Newcomer, L. & Stichter, J. (2004). Applied Behaviour Analysis and the Education and Treatment of Students with Emotional and Behavioural Disorders. In R. B. Rutherford, M. Magee Quinn, and S. R. Mathur, *Handbook of Research in Emotional and Behavioural Disorders*, (pp 523-5450. London: The Guilford Press.

- Lichter, D. G. & Cummings, J. L. (Eds.). (2001). *Frontal-subcortical circuits in psychiatric and neurological disorders*. New York: Guilford Press.
- Maag, J. (2001). Rewarded by punishment: Reflections on the disuse of positive reinforcement in schools. *Exceptional Children*, 67, 173-186.
- Mahony, T. (2003). *Words Work!* Llandysul: Crown House Publishing.
- Mandell, D. J., & Ward, S. E. (2011). Building the blocks of executive functioning: differentiating early developing processes contributing to executive functioning skills. *Dev Psychobiol.* 53(8):796-805. Located at: <http://www.ncbi.nlm.nih.gov/pubmed/21563178>
- Marcuse, H. (2002). *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society*. London: Routledge.
- Martel, M., Nikolas, M. & Nigg, J. T. (2007). Executive function in adolescents with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry*, 46, 1437-1444.
- Martin, H., & Carroll, D. (2005). An evaluation of the use of the behaviour questionnaire. XXXX *Educational Psychology in Practice*, 21,(3), 175-196.
- Martin, J., Sugarman, J. & McNamara, J. (2000). *Models of Classroom Management*. Calgary, Alberta, Canada: Detselig Enterprises Ltd.
- Marzano, R. J., Marzano, J. S. & Pickering, D. J. (2003). *Classroom Management that Works*. USA: Association for Supervision and Curriculum Development.
- Maslow, A. (1970). *Motivation and Personality*. New York: Harper & Row.
- McAtee, E. C. (1999). *Investigation of deficits in higher level executive functioning as a prerequisite for adult basic education intervention, final report, fiscal year 1998 - 1999*. Northwest Tri County Intermediate Unit, Edinboro, PA.
- McCloskey, G., Perkins, L. A. & Van Divner, B. (2009). *Assessment and Intervention for Executive Function Difficulties*. London: Routledge.
- McKee, W. T., & Witt, J. C. (1990). Effective teaching: A review of instructional and XXXX environmental variables. In T. B. Gutkin., & C.R. Reynolds. (Eds.). *The XXXX Handbook of School Psychology*, (pp. 821-846). New York: John Wiley & XXXX Sons.
- Mead, G. H. (1934). In C. W. Morris, (Ed.). *Mind, self and society*. Chicago: The University of Chicago Press.

- Meltzer, L. (2010). *Promoting Executive Function in the Classroom*. London: The Guilford Press.
- Mental Health Foundation. (2014). Located at: <http://www.mentalhealth.org.uk/help-information/mental-health-a-z/C/children-young-people/>
- Miller, A. 1989. Paradigms lost: what theory informs educational psychologists in their use of behaviour approaches? *Educational Psychology in Practice*, 5,(3), 6-16.
- Miller, A. (1996). But **What** about the Others? Teachers experiences of the impact of XXXX individual behavioural interventions on other class members. *Educational XXXXXX Psychology in Practice*, 11,(4), 30-34.
- Miller, G. (1969). Psychology as a means of promoting human welfare. *American XXXX Psychologist*, 24,1063–1075.
- Miller, S. (1984). *Experimental Design and Statistics*. London: Routledge.
- Minton, S. J. (2012). *Using Psychology in the Classroom*. London: Sage.
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. XXXXXXX *Science*, 244,(4907), 933–938.
- Monchi, O., Petrides, M., Petre, V., Worsley, K., and Dagher, A. (2001). Wisconsin card xxxx sorting revisited: Distinct neural circuits participating in different stages of the xxx task identified by event-related functional magnetic resonance imaging. *Journal of Neuroscience*, 21 7733-7741
- Moraine, P. (2012). *Helping Students Take Control of everyday Executive Functions*. London: Jessica Kingsley Publishers.
- Moraine, P. (2012). *Everyday Executive Functions*. London: Jessica Kingsley Publishers.
- Moreno, G. (2010). No need to count to ten: advocating for the early implementation of the Functional Behavioural Assessment in addressing challenging behaviours. *Emotional and Behavioural Difficulties*, 15,(1), 15-22.
- Mowat, J. G. (2010). Towards the development of self-regulation in pupils experiencing social and emotional behavioural difficulties (SEBD). *Emotional and Behavioural Difficulties*, 15,(3), 189 - 206.
- Mroz, A. (2014, March 10). ‘We already teach grit, if you know where to look’. *Times Educational Supplement*, p. 4.
- Muhammad, A. (2009). *Transforming School Culture*. USA: Solution Tree Press.
- Muijs, D., & Reynolds, D. (2011). *Effective Teaching*. London: SAGE publications Ltd.

- Murphy, M. and Fleming, T. (Eds.). (2012). *Habermas, Critical Theory and Education*. Abingdon: Routledge.
- Nadeau, M. & Nolin, P. (2013). Attentional and Executive Functions in Neglected Children *Journal of Child & Adolescent Trauma*. 6,(1), 1 - 10.
- National Prescribing Centre, MeRec. (2011). *Supporting adoption of evidence into practice*. 22(2). Located at: http://www.npc.nhs.uk/merec/therap/other/XXXXXXXXXmerebulletin_vol22_no2.php
- National Autistic Society. Located at: <http://www.autism.org.uk/Working-with/Health/Screening-and-diagnosis/The-genetics-of-autism-spectrum-disorders.aspx>
- Neuroscience and Education Issues and Opportunities, (2013). Located at: XXXXXXXX<http://www.esrcsocietytoday.ac.uk>. Accessed on April 17, 2013.
- Nelson, H. E., (1976). A modified card sorting test sensitive to frontal lobe deficits. *Cortex*, xxx 12, 313-324.
- Nicholls, D. and Houghton, S. (1995). The effect of Canter's Assertive Discipline Program on teacher and student behavior. *British Journal of Educational Psychology*, Vol 65, Issue 2, P. 197–210.
- Norwich, B. (2000). Educational psychology and special educational needs: How they relate XXXX and where is the relationship going? *Educational and Child Psychology*, 17, (2), XXXX 5 - 15.
- Norwich, B. (2005). Future directions for professional educational psychologist. *School XXXX Psychology International*. 26,(4), 387 - 397.
- Ofsted (2005) *Managing Challenging Behaviour*. London: Ofsted.
- Ozonoff, S., Beth, L., Goodlin-Jones, B. L., & Solomon, M. (2005). Evidence-Based XX XX Assessment of Autism Spectrum Disorders in Children and Adolescents. XX XX *Journal of Clinical Child and Adolescent Psychology*, 34,(3), 523-540.
- Parsons, T. (2012). *The Social System*. New Orleans: Quid Pro LLC.
- Paul, R., & Elder, L. (2007). *A Critical Thinker's Guide To Educational Fads*. Tomales, CA: Critical Thinking Press.
- Pennington, B. F., Bennetto, L., McAleer, O. & Roberts, R. J. (1996). Executive XX XXXX functions and working memory: Theoretical and measurement issues. In G. XXXX R.Lyon & N. A.Krasnegor, (Eds.). *Attention, memory, and executive XX XXXXX function*. (pp 327 - 348). Baltimore: Brookes.

- Pernell, E., McIntyre, L., & Bader, L. (2001). Mainstreaming: A continuing concern for
XXXX teacher. *Education, 106*, 131-137.
- Perry, B. D. (2008). *The Boy Who Was Raised as a Dog*. USA: Basic Books.
- Petrides, K., Sangareau, Y., Furnham, A. & Frederickson, N. (2006). Trait emotional
intelligence and children's peer relations at school. *Social Development, 15*: 537–
547.
- Pick, D, (1989). *Faces of Degeneration. A European Disorder, c. 1848 – c. 1918*.
Cambridge: Cambridge University Press.
- Pickering, S. J. & Howard-Jones, P. (2007). Educators' views on the role of neuroscience
in education: Findings from a study of UK and international perspectives.
Mind, Brain and Education, 1, 109-13.
- Picton, T. W., Alain, C., & McIntosh, A. R. (2002). The theatre of the mind:
XXXXX Physiological studies of the human frontal lobes. In D. T. Stuss., & R. T. Knight,
(Eds.). *Principles of frontal lobe function*, (pp 109 - 126). New York: Oxford
University Press.
- Polsgrove, L. & Smith, W. (2004). Informed Practice in Teaching Self-Control to Children
with Emotional and Behavioural Disorders. In R. B. Rutherford, M, Magee Quinn,
and S. R. Mathur, *Handbook of Research in Emotional and Behavioural
Disorders*, (pp 399-425). London: The Guilford Press.
- Popper, K. (1959). *The logic of scientific discovery*. New York: Basic Books.
- Porteus, S, D. (1959). *The Maze Test and Clinical Psychology*. Palo Alto, California:
XXXX Pacific Books.
- Posner, M. I., & Rothbart, M. K. (2007). Research on Attention Networks as a Model for
XXXXXX the Integration of Psychological Science. *Annual Review of Psychology, 58*:
XXX 1-23.
- Poulou, M. (2005). The Prevention of Emotional and Behavioural Difficulties in Schools:
Teachers' suggestions. *Educational Psychology in Practice, 21*,(1), 37-52.
- Pound, L. (2014). *How Children Learn*. London: Practical Pre-school Books.
- Presland, J. (1978). 'Teachers reactions to Behaviour modification workshops', *Occasional
Papers of the DECP, 2*,(1), 13-19.
- Price, B. H., Daffner, K. R., Stowe, R. M., & Mesulam, M. M. (1990). The
compartmental learning disabilities of early frontal lobe damage. *Brain, 113*, (Pt.
5), 1383-1393.

- Rathvon, N. (2008). *Effective School Interventions*. London: The Guilford Press.
- Reid, K., Flowers, P., & Larkin, M. (2005). Exploring lived experience: An introduction to Interpretative Phenomenological Analysis. *The Psychologist*, 18,(1), 20-23.
- Reilly, C., Bampbell, A., & Keran P. (2009). Screening for Asperger syndrome in school age children: issues and instruments. *Educational Psychology in Practice*, 25,(1), 37-52.
- Reiss, A. L., Abrams, M. T., Singer, H. S. Ross J. L., & Denckla, M. B. (1996). Brain development, gender and IQ. in children. A volumetric imaging study. *Brain*, 119, 1763-1774.
- Rex, J. (Ed.). (1974). *Approaches to Sociology: an Introduction to Major Trends in British Sociology*. London: Routledge & Kegan Paul.
- Reynolds, D. (1992) School Effectiveness and School Improvement: An Updated Review of the British Literature. In D. Reynolds & P. Cuttance (Eds.). *School Effectiveness Research, Policy and Practice*. London: Cassell.
- Robertson, J. (1998). *Effective Classroom Control*. London: Hodder & Stoughton.
- Rogers, B. (2000). *Classroom Behaviour*. Gateshead: Books Education.
- Rogers, B. (2013) <http://headguruteacher.com/2013/01/06/behaviour-management-a-bill-rogers-top-10/>
- Rosier, M. (2000). Introduction to Item Response Theory. Located at <http://www.toodoc.org/rosier-ppt.html>
- Rush, C. & Harrison, P. (2008). Ascertaining teachers' perceptions of working with adolescents diagnosed with attention-deficit/hyperactivity disorder. *Educational Psychology in Practice*, 24,(3), 207-223.
- Rutter, M. & Smith, D. (Eds.). (1995). *Psychosocial Disorders in Children and Young People*. London: Wiley
- Salamanca Statement, (1994). Located at <http://www.unescobkk.org/education/inclusive-education/what-is-inclusive-education/background/>
- Santrock, J. W. (2006). *Educational Psychology*. London: McGraw Hill.
- Savoy, R. L. (2002). Functional magnetic resonance imaging fMRI. In V. Ramachandran (Ed.), *Encyclopedia of the brain*. San Diego: Academic Press.
- Schwartz, J. (1996). *Brain lock: Free yourself from obsessive-compulsive behavior: A four-step self-treatment method to change your brain chemistry*. New York: Harper.

- Schore, A. N. (2000). Attachment and the regulation of the right brain. *Attachment & Human Development, Vol. 2, (1), P. 23-47.*
- Scope, A., Empson, J., & McHale, S. (2010). Executive function in children with high and low attentional skills: Correspondences between behavioural and cognitive profiles. *British Journal of Developmental Psychology, 28, 293-305.*
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalised Causal Inference.* United Kingdom: Wadsworth.
- Shallice, T., & Burgess, P. (1991). "Higher-Order Cognitive Impairments and Frontal Lobe Lesions in Man". In Harvey Levin, Howard Eisenberg and Arthur Benton. (Eds.). *Frontal Lobe Function and Dysfunction.* New York: Oxford University Press, Inc. pp. 125–128.
- Sharples, J. (2013). Located at: <http://www.researched2013.co.uk/author/jonathan/>
- Shavelson, R. J., & Towne, L. (Eds.). (2002). Washington, DC: National Academy Press. *Scientific Research in Education.*
- Skinner, B. F. (1953). *Science and Human Behaviour.* New York: The Free Press.
- Solity, J. (1996). Discrepancy Definitions of Dyslexia. *Educational Psychology in Practice, 12,(3), 141-151.*
- Spaulding, L. S., Mostert, M. P., & Beam, A. (2010). Is Brain Gym an Effective Educational Intervention? Located at: http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1167&context=educ_fac_pubs
- Spellings, M. (2008). In: L.Higgins., & C. Pratt-Dawsey, (2008, April 23). *Changes to No Child unveiled.* Detroit Free Press, 177, (P. 1).
- Stage, S. A. and Quiroz, D. R., (1997). A meta-analysis of interventions to decrease disruptive classroom behavior in public education settings. *School Psychology Review, Vol 26(3), 1997, 333-368.*
- Stallard, P. (2002). *Think Good - Feel Good: A Cognitive Behaviour Therapy Workbook for Children and Young People.* Chichester: John Wiley and Sons Ltd.
- Stallard, P. (2013). Cognitive behavioural approaches to mental health difficulties in children. In T. Cole, H. Daniels and J. Visser., (Eds.). *The Routledge International Companion to Emotional and Behavioural Difficulties.* (pp. 122-129). Abingdon: Routledge.
- Stoker, R. (1987). Systems intervention in schools – the ripple effect. *Education Psychology in Practice., 3(1), 229-242.*

- Sugai, G., Horner, R. H., & Gresham, F. M. (2002). Behaviorally effective school environments. In M. R. Shinn, H. M. Walker & G. Stoner (Eds.), *Interventions for academic and behavioural problems*. Bethesda, MD: National Association of School Psychologists.
- Sugai, G. and Horner R., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson, C. M., Scott, T., Liaupsin, C., Sailor, W., Turnbull, A. P., Turnbull, H., Wikham, D., Wilcox, B, and Ruef, M. (2000). 'Applying positive behavior supports and functional behavioural assessment in schools'. *Journal of Positive Behaviour Interventions*, 2: 131-43.
- Sulzer-Azaroff, B. & Mayer, R. (1977). *Applying behaviour-analysis procedures with children and youth*. New York: Holt Rinehart & Winston.
- Swann, J. (2003). 'How can science contribute to the improvement of educational practice?' *Oxford Review of Education*, 29(2), 253-68.
- Sweller, J., & Rubie-Davies, C. M. (2011). Conclusion: Some potential influences of educational psychology on educational research. In C. M. Rubie-Davies. (Ed.), *Educational Psychology: Concepts, Research and Challenges*. (pp. 268). London: Routledge.
- Swinson, J., & Knight, R. (2007). Teacher Verbal Feedback in Practice: theory, research and practical educational psychology. *Educational Psychology in Practice*. 23,(3), 241 – 255.
- Swinson, J. & Harrop, A. (2001). The Differential Effects of Teacher Approval and Disapproval in Junior and Infant Classrooms. *Educational Psychology in Practice*. 17,(2),157-168.
- Swinson, J, Woof, C. & Melling, R. (2003). Including emotional and behavioural difficulties pupils in a mainstream comprehensive: a study of the behaviour of pupils and classes. *Educational Psychology in Practice*. 19,(1), 65 - 75.
- Taylor, C. 2010). *A Practical Guide to Caring for Children and Teenagers with Attachment Difficulties*. London: Jessica Kingsley Publishers.
- Taber, K, S. (2013). Beyond Positivism: Scientific research into Education. In E. Wilson, (Ed.), *School-Based Research: A guide for education students*. (pp. 287-304). London: SAGE Publications Ltd.
- Taylor, K. (2012). *The Brain Supremacy*. St. Ives: Oxford University Press.
- Temple, C. (1997). *Developmental Neuropsychology*. UK: Psychology Press.

- Thomas, N. & Smith, C. (2004). Developing Play Skills in Children with Autistic Spectrum Disorders. *Educational Psychology in Practice*, 20,(3), 195-206.
- Thomson, A. (2007). Looked After Children: Non-local authority placements and meeting educational needs. *Educational Psychology in Practice*. 23, (3), 273-282.
- Thomson L. & Anderson A. (2011). Research methods in education. In C. Rubie-Davies, (Ed.), *Educational Psychology. Concepts, Research & Challenges*. (pp. 8-17). London: Routledge.
- Thompson, R.F. (2000). *The Brain: A Neuroscience Primer*. New York: Worth Publishers.
- Tod, J. & Ellis, S. (2009) *Behaviour for Learning: Proactive Approaches to Behaviour Management*. New Zealand: Routledge.
- Thorell, L. B., Lindqvist, S., Bergman Nutley, S., Bohlin, G., & Klingberg T. (2009). Training and transfer effects of executive functions in preschool children. *Developmental Science*, 12,(1),106-113.
- Toplak, M. T., Bucciarelli, S. M., Jain, U., & Tannock, R. (2009).Executive Functions: Performance-Based Measures and the Behaviour Rating Inventory of Executive Function (BRIEF) in Adolescents with Attention Deficit/Hyperactivity Disorder (ADHD). *Child Neuropsychology*, 15, 53 - 72.
- Tremblay, R. E., Nagin, D. S., Seguin, J. R., Zoccolillo, M., Zeazo, P. D., Boivin, M., Perusse, D. & Japel, C. (2004). Physical aggression during early childhood: trajectories and predictors. *Paediatrics*, 114,(1), e43-e50.
- Van der Aalswoort, G., & Elliott, J. (2007). Editorial: Inclusion and the role of educational psychologists. *Educational and Child Psychology*, 24,(3), 4-7.
- Van de Vijver, F., & Tanzer, N. K. (2004). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology*, 54(2), 119–135.
- Varma, S., McCandliss, B. D., & Schwartz, D. I. (2008.) Scientific and pragmatic challenges for bridging education and neuroscience. *Educational Researcher*, 37, 140-52.
- Varma, V. (Ed.). (1996). *Violence in Children and Adolescence*. London & Bristol: Jessica Kingsley Publishers.
- Vaughn, B. E., Kopp, C. B., & Krakow, J. B. (1984). The emergence and consolidation of self-control from eighteen to thirty months of age: Normative trends and individual differences. *Child Development*, 55, 990 -1004.

Viding, E., Blair, R. J. R., Moffitt, T. E. and Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology and Psychiatry*, 46, no. 6: 592-7.

Visser, J. (2000). *Managing Behaviour in Classrooms*. London: David Fulton Publishers.

Visser, J. (2003). *A study of children and young people who present challenging behaviour* Retrieved from <http://www.ofsted.gov.uk/resources/study-of-children-and-young-people-who-present-challenging-behaviour-literature-review>

Vygotsky, L. (1985). In J. V. Wertsch *Vygotsky and the Social Formation of Mind* (p.66). Cambridge, MA: MIT Press.

Vygotsky, L. S. (1986). *Thought and Language*. U.S.A.: The Massachusetts Institute of Technology.

Waas, G. A. (2002) 'Identifying evidence-based interventions in school psychology: building a bridge or jousting with windmills?' *School Psychology Quarterly*, 17, 508-17.

Warnock Committee. (1978). *Special Educational Needs: The Warnock Report*. London: DES.

Waterman, J. & Walker, E. (2009). *Helping At-Risk Students*. Canada: The Guilford Press.

Watson, T. S. and Steege, M. W. (2003). *Conducting School-Based Functional Behavioural Assessments*. London: The Guilford Press.

Weare, K., (2010). 'Mental health and social emotional learning: evidence, principles, tensions, balances'. *Advances in School Mental Health Promotion*, 3, (1), 5-17.

Weare, K. & Gray, G. (2003). *What works in Developing Children's Emotional and Social Competence and Wellbeing?* Nottingham: DfES.

Webster, A., Hingley, P., & Franey, J. (2000). Professionalisation and the Reduction of Uncertainty: a study of new entrants to educational psychology. *Educational Psychology in Practice*, 16,(4), 431-448.

Webster, A., & Hoyle, E. (2000). The 'new professionalism' and the future of educational psychology. *Educational and Child Psychology* 17(2), 95 - 104.

Wellcome Trust and Foundation, (2014). Neuroscience in classroom. <http://www.wellcome.ac.uk/News/Media-office/Press-releases/2014/WTP055264.htm>. Accessed on 12th March 2014.

- Welsh, M. C. and Pennington, B. F. (1988). Assessing frontal lobe functioning in children. Views from developmental psychology. *Developmental Neuro-psychology*, 4, 199-230.
- Welsh, M. C., Pennington, B. F. and Groisser, D. B. (1991). A normative-developmental study of executive function: A window on prefrontal function in children, *Developmental Neuropsychology*, Vol. 7, 2, P. 131-149.
- Wheldall, K. (1984). *Positive Teaching: The Behavioural Approach*. United Kingdom: Unwin Hyman.
- Wigelsworth, M., Humphrey, N., Kalambouka, A., & Lendrum, A. (2010). A review of key issues in the measurement of children's social and emotional skills. *Educational Psychology in Practice*, 26,(2), 173 -186.
- Wilkinson, L. (2005). Supporting the Inclusion of a Student with Asperger Syndrome: A case study using Conjoint Behavioural Consultation and Self-management. *Educational Psychology in Practice*, 2,1(4), 307-326.
- Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/hyperactivity disorder: A meta-analytic review. *Biological Psychiatry*, 57, 1336 - 1346.
- Williams, J. A., Imamura, M., and Fregni, F. (2009). 'Updates on the use of non-invasive brain stimulation in physical rehabilitation medicine', *Journal of Rehabilitation Medicine*, 41, pp. 305-11.
- Willis, B. (1994). Behaviour Policy and Staff Support: Helping Schools to Help Themselves. *Educational Psychology in Practice*, 10,(3), 150-54.
- Wilson, E. (Ed.) (2013). *School-based Research*. London: Sage.
- Wooldridge, A. (1994). *Measuring the Mind: Education and Psychology in England c.1860-c.1990*. Cambridge: Cambridge University Press.
- Wright, C. L. (2010). *Executive functioning skills in a school district*. USA: UMI XX XXX XXXX Dissertation Publishing.
- Young Minds. (2014). Located at <http://www.youngminds.org.uk>
- Zajonc, R. (1966). Social facilitation of dominant and subordinate responses. *Journal of XXXXXX Experimental Social Psychology*, 2,(2), 160-168.
- Zeidner, M., Roberts, R.D. & Matthews, G. (2002). Can emotional intelligence be schooled? XXX A critical review. *Educational Psychologist*, 37 215–231.

APPENDICES

Appendix A: Ethical considerations

Ethical Considerations

The following actions will be taken to comply with the British Psychological Society (BPS) (2009) guidelines regarding ethical standards expected when conducting psychological research.

Guidelines:

Principle 1.2 Standard of privacy and confidentiality.

Psychologists should:

- (i) *Record, process, and store confidential information in a fashion designed to avoid inadvertent disclosure.*" (BPS, 2009, p. 11).

Action proposed -

The anonymity of respondents will be protected through each class being coded as A, B and C. Within each class, pupils will then be allocated a subject rating with their gender. That is S1A(M).

The data collected by the researcher will be anonymous. The BRIEF questionnaire will be completed by the class teachers.

No information held by the university or researcher will be related back to identify a particular individual. This is in keeping with University data collection guidelines.

Principle 1.3, Standard of informed consent.

- (i), *"Ensure that clients, particularly children and vulnerable adults, are given ample opportunity to understand the nature, purpose, and anticipated consequences of any professional services or research participation, so that they may give informed consent to the extent that their capabilities allow."* (BPS, 2009, p. 12).

Action proposed -

The aim of the project will be explained to participants.

Participants will be informed that the skills they will be practising may assist them in being successful in the classroom, and will be of value when they are transferred to secondary school.

The activities will be designed to be short and enjoyable. Participants will record their progress.

Principle 1.4, Standards of self-determination.

- (ii), *"Ensure from the first contact that clients are aware of their right to withdraw at any time from the receipt of professional services or from research participation."* (BPS, 2009, p. 14).

Action proposed

Participants will be fully informed of the project procedures and give their written consent to

their class teacher prior to the teacher completing the BRIEF questionnaire.

All participants will be informed that any data obtained will be confidential, anonymised and stored securely for a limited period.

All participants will be informed that they can withdraw from the project at anytime, view any information held on them and ask for it to be deleted.

The researcher will transcribe the data supplied by the teachers, which will ensure further the confidentiality of the data.

Names of participants, teachers and places will all be deleted from any information obtained to maintain anonymity.

Participants will be fully debriefed at the end of the project.

The contact details of the researcher and his supervisor will be provided on the consent and debriefing forms to the YR6 participants, class teachers and home.

Details of University Cardiff Ethics Committee will be provided pre and post data collection, with contact information in the case of complaints.

Principle 3.3, Standard of protection of research participants.

(1) *“Consider all research from the standpoint of research participants, for the purpose of eliminating potential risks to psychological well-being, physical health, personal values, or dignity.”* (BPS, 2009, p. 19).

Action proposed -

Unexpected distress.

There is always a possibility that children may become upset during the sessions. It is highly unlikely that the executive functioning skills activities might lead to any distress. The causes for their upset may well be unrelated to the activity in which they are involved. If such was to occur, the class teacher and a teaching assistant will always be present to offer comfort and support. Should it be necessary for a child to leave a session this can be sensitively arranged with the class teacher. To have adults known to the children always present is also likely to add confidence, especially for those who may be anxious in new situations.

Intervention Issues

The fact that this project involves interventions raises potential ethical issues. The aim of research should be to provide maximum benefits to those who participate. The interventions to be applied to the experimental group (see appendix 9) are those that have been empirically shown to produce predictable and beneficial outcomes (Kratochwill & Shernoff 2003). This reduces the likelihood of any negative consequences. In addition, if the research findings indicate the efficacy of applying executive functioning skills at a whole class level then applying the same procedures to other classes will be justified.

Taking into account of the potential benefits of the interventions delivered to the experimental group, it is intended that at the end of the study the teachers of non-experimental groups will be given access to the same materials to deliver to their classes.

Principle 3.4, Standard of debriefing of research participants.

(i) *“Debrief research participants at the conclusion of their participation, in order to inform*

them of the outcomes and nature of the research, to identify any unforeseen harm, discomfort, or misconception, and in order to arrange for assistance as needed.” (BPS, 2009, p. 20).

Action proposed -

At the end of the final session a debrief letter will be provided to all participants, with contact details if further information is required and for any complaints to be submitted.

“Student investigators must be under the supervision of a member of Academic Staff.” (BPS, 2004, p5).

Action proposed -

A member of academic staff at Cardiff University is to supervise this research study.

Supporting Information

Criminal Record Certificate.

Disclosure Number 001255100090.

Appendix B: Three sub-scales for Behaviour Regulation Index

Inhibit

- 38 Does not think before doing
- 41 Underestimates time needed to finish tasks
- 43 Is impulsive
- 49 Starts assignments or chores at the last minute
- 54 Gets stuck on one topic or activity
- 55 Talks or plays too loudly
- 56 Written work is poorly organised
- 59 Gets in trouble if not supervised by an adult
- 65 Does not realize that certain actions bothers others

Shift

- 5 Resists or has trouble accepting a different way to solve a problem
- 6 Becomes upset with new situations
- 8 Has a short attention span
- 12 Does not bring home homework
- 13 Acts upset by a change in plans
- 23 Forgets to hand in homework, even when completed
- 30 Has trouble getting used to new situations
- 39 Has trouble finishing tasks

Emotional control

- 1 Over reacts to small problems
- 7 Has explosive, angry outbursts

- 20 Backpack is disorganised
- 25 Has trouble with chores or tasks that have more than one step
- 26 Has outbursts for little reason
- 45 Gets out of seat at the wrong time
- 50 Has trouble getting started on homework or chores
- 62 After having a problem, will stay disappointed for a long time
- 64 Angry or tearful outbursts are intense but end suddenly
- 70 Has trouble thinking of a different way to solve a problem when stuck

Appendix B1: Behaviour Regulation Index

Teacher Questionnaire

Pupil Name

Cut here

Subject Number

Gender of pupil Male Female Age ----- Date -----

How well do you know this pupil?

Not well Moderately well Very well

The following statements describe children. I would like to know if the pupil has had problems with these behaviours. Please answer all the items the best that you can. PLEASE DO NOT SKIP ANY ITEM. Think about the pupil as you read each statement and circle your response

N = Never S = Sometimes O = Often

- | | | | |
|--|---|---|---|
| 1 Needs to be told “no” or “stop that” | N | S | O |
| 2 Does not think before doing | N | S | O |
| 3 Interrupts others | N | S | O |
| 4 Is impulsive | N | S | O |
| 5 Gets out of seat at the wrong times | N | S | O |
| 6 Gets out of control more than friends | N | S | O |
| 7 Acts too wild or “out of control” | N | S | O |
| 8 Has trouble putting the brakes on his/her activities | N | S | O |
| 9 Gets in trouble if not supervised by an adult | N | S | O |
| 10 Does not think of consequences before acting | N | S | O |
| 11 Cannot get a disappointment, scolding, or | N | S | O |

insult off his/her mind

12 Resists or has trouble accepting a different way to solve a problem with schoolwork, friends chores etc.	N	S	O
13 Becomes upset with new situations	N	S	O
14 Acts upset by a change in plans	N	S	O
15 Is disturbed by a change in teacher or class	N	S	O
16 Resists change of routine, foods, places etc.	N	S	O
17 Has trouble getting used to new situations (classes, groups, friends)	N	S	O
18 Thinks too much about the same topic	N	S	O
19 Gets stuck on one topic or activity	N	S	O
20 After having a problem, will stay disappointed for a long time	N	S	O
21 Overreacts to small problems	N	S	O
22 Has explosive, angry outbursts	N	S	O
23 Has outbursts for little reason	N	S	O
24 Mood changes frequently	N	S	O
25 Reacts more strongly to situations than other children	N	S	O
26 Mood is easily influenced by the situation	N	S	O
27 Angry or tearful outbursts are intense but end suddenly	N	S	O
28 Small events trigger big reactions	N	S	O
29 Becomes upset too easily	N	S	O

Appendix C: Rater consistency/ inconsistency Scale

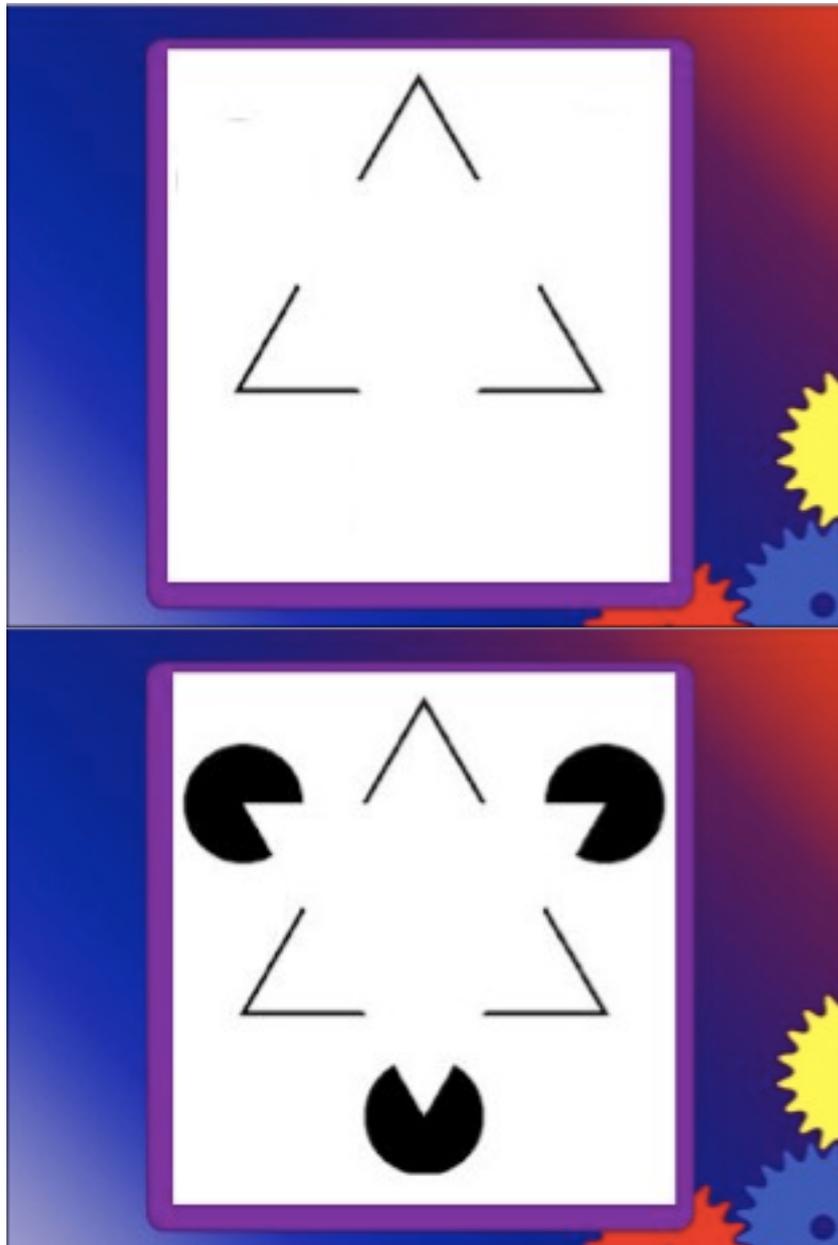
Mood changes frequently	N	S	O
Has outbursts for little reason	N	S	O
Leaves work incomplete	N	S	O
Has trouble finishing tasks	N	S	O
Interrupts others	N	S	O
Is impulsive	N	S	O
Gets out of seat at the wrong times	N	S	O
Needs to be told “no” or “stop that”	N	S	O
Is unaware of own behaviour when in a group	N	S	O
Does not realise that certain actions bother others	N	S	O
Gets out of control more than friends	N	S	O
Has trouble putting the brakes on his/her actions	N	S	O
Reacts more strongly to situations than other children	N	S	O
Small events trigger big reactions	N	S	O
Talks or plays too loudly	N	S	O
Acts too wild or “out of control”	N	S	O
Acts too wild or “out of control”	N	S	O
Is unaware of own behaviour when in a group	N	S	O
Leaves a trail of belongings wherever he/she goes	N	S	O
Does not realise that certain actions bothers others	N	S	O

Appendix D: Programme intervention

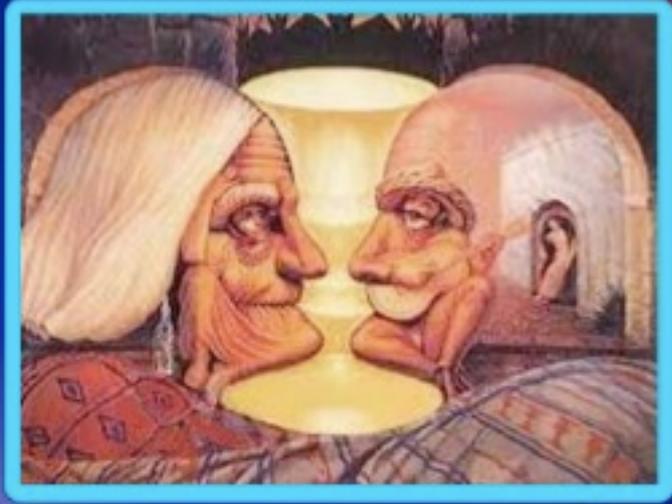
Illusions obtained from:

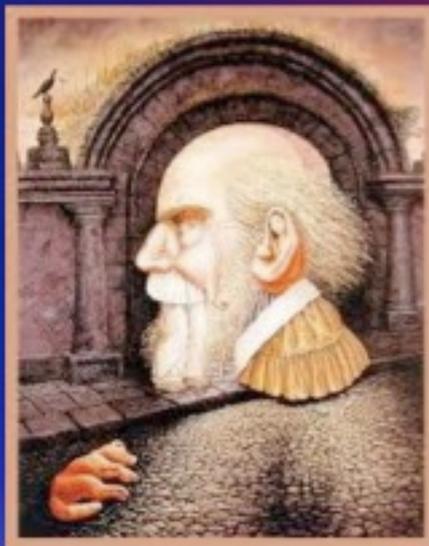
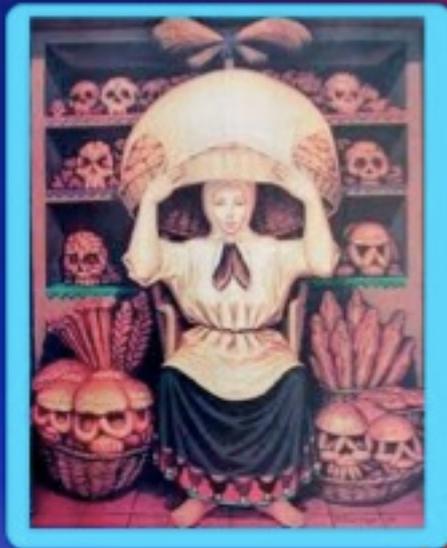
<http://www.google.co.uk/images?q=illusions&hl=en-GB&gbv=2&tbn=isch&ei=IFm-U6zfHczJPcicfgJ&start=80&sa=N>













Mazes obtained from:

http://www.google.co.uk/images?q=mazes+printable&hl=en-GB&gbv=2&tbn=isch&oq=mazes+&gs_l=img.1.7.0l10.11257.12919.0.20515.8.8.0.0.0.0.130.662.7j1.8.0....0...1ac.1.34.img..0.8.660.IB-dEda-wek

Mazes

Pupils given mazes of varying degrees of difficulty.



Words can have different meanings

Pupils given statements with alternative meanings to discuss.

REFERENCE <http://www.fun-with-words.com/ambiguities.html>

1

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

2

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

3

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

4

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

HOSPITALS ARE SUED BY 7 FOOT DOCTORS

5

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

HOSPITALS ARE SUED BY 7 FOOT DOCTORS

TWO SOVIET SHIPS COLLIDE, ONE DIES

6

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

HOSPITALS ARE SUED BY 7 FOOT DOCTORS

TWO SOVIET SHIPS COLLIDE, ONE DIES

RED TAPE HOLDS UP NEW BRIDGE

7

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

HOSPITALS ARE SUED BY 7 FOOT DOCTORS

TWO SOVIET SHIPS COLLIDE, ONE DIES

RED TAPE HOLDS UP NEW BRIDGE

FRUIT FLIES LIKE A BANANA

8

SAFETY EXPERTS SAY SCHOOL BUS PASSENGERS
SHOULD BE BELTED

QUARTER OF A MILLION CHINESE LIVE ON WATER

GRANDMOTHER OF EIGHT MAKES HOLE IN ONE

HOSPITALS ARE SUED BY 7 FOOT DOCTORS

TWO SOVIET SHIPS COLLIDE, ONE DIES

RED TAPE HOLDS UP NEW BRIDGE

FRUIT FLIES LIKE A BANANA

FREE WHALES

Unusual uses for everyday objects.

Pupils given familiar objects and asked to think of novel uses.

REFERENCE <http://www.fun-with-words.com/ambiguities.html>

Unusual uses for a:



- 1.....
- 2.....
- 3.....

Unusual uses for a:



- 1.....
- 2.....
- 3.....

Unusual uses for a:



- 1.....
- 2.....
- 3.....

Unusual uses for a:



- 1.....
- 2.....
- 3.....

Emotional control

Problem solving

Pupils told the Turtle story and discussed how it could be used.

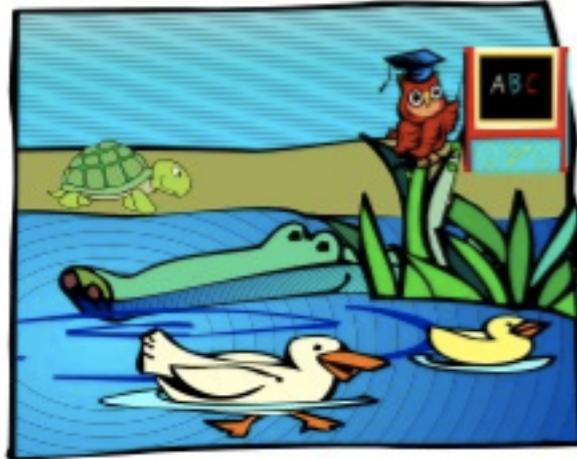


Tucker Turtle Takes Time to Tuck and Think

Created using pictures from Microsoft Clipart® and Weston-Stratton, C. (1987). The teachers and children videotape series: One dinosaur school. Seattle, WA: The Incredible Years.

 Center on the Social and Emotional Foundations for Early Learning

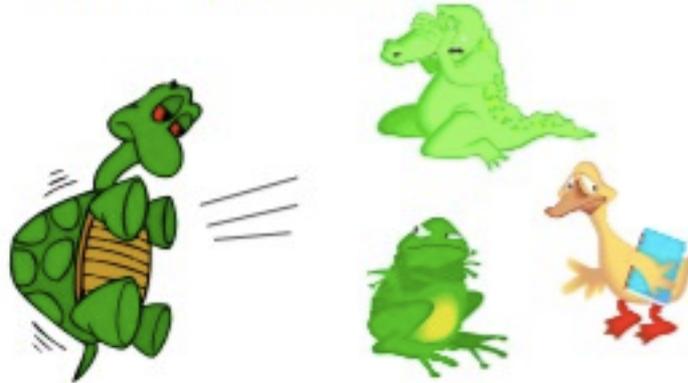
Tucker Turtle is a terrific turtle. He likes to play with his friends at Wet Lake School.



But sometimes things happen that can make Tucker really mad.



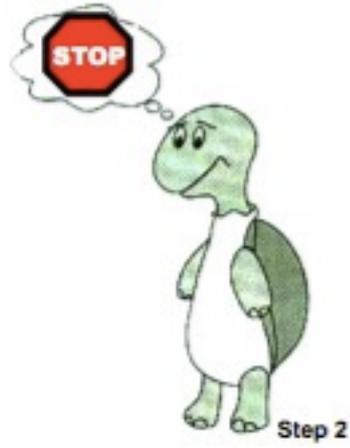
When Tucker got mad, he used to hit, kick, or yell at his friends. His friends would get mad or upset when he hit, kicked, or yelled at them.



Tucker now knows a new way to "think like a turtle" when he gets mad.



He can **stop** and keep his hands, body, and yelling to himself!



He can **tuck** inside his shell and take **3 deep breaths to calm down.**



Tucker can then **think of a solution** or a way to make it better.



Step 4



Tucker's friends are happy when he plays nicely and keeps his body to himself. Friends also like it



The End!



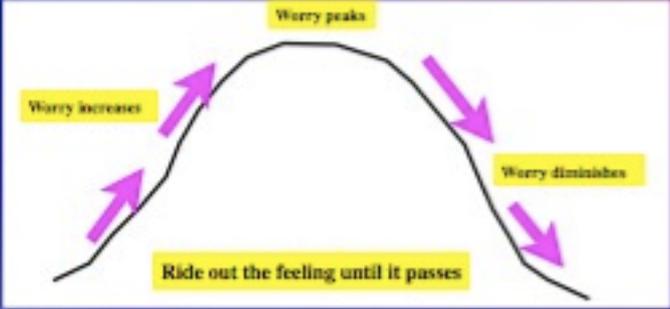
Emotional control

Emotional awareness

Pupils introduced to and
discussed stresses and
the 'worry hill'.



The "Worry Hill"



Understanding feelings

Emotional control

Self-control

Pupils introduced to concept of self-control, and agreed a target behaviour for improvement.

Self-monitoring - observe & record

Step 1 Select and clearly define a target behaviour in school.

Step 2 Between today and the --- October, how often would you like to do the target behaviour?

Step 3 Record when ever this behaviour occurs.

Step 4 My recognition for success is

Self-monitoring - observe & record

Step 1 Select and clearly define a target behaviour in school.

Step 2 Between today and the 17th June, how often would you like to do the target behaviour?

Step 3 Record when ever this behaviour occurs.

Step 4 My recognition for success is

Class Routines

Can you name three routines in your class?

1

2

3

DO

Class Routines

Someone new has joined your class. Can you help them understand this routine.
What to do and not do?
I

DON'T

**Self-monitoring
- observe & record**

Step 1 Select and clearly define a target behaviour in school.

Step 2 Between today and the 17th June, how often would you like to do the target behaviour?

Step 3 Record when ever this behaviour occurs.

Step 4 My recognition for success is

Good behaviour works for us

**Responsible behaviour meets
our needs**

Does not deny others theirs

RIGHTS & RESPONSIBILITIES

THE RIGHT:

To be safe



For my property to be
safe



To be treated with
respect



To learn



THE RESPONSIBILITY:

To not threaten others

Respect the property of
others

To respect others equally

respect

To not interfere with others
learning

COGNITIVE CONTROL

- 1 When you feel you might do something that is harmful, STOP - THINK
- 2 What are some other things you could do?
- 3 CHOOSE the best one

Self-Monitoring

TIME NO 1	I did it without thinking	I thought but still did it	I thought & did it less	I didn't do it
TIME NO 1	I did it without thinking	I thought but still did it	I thought & did it less	I didn't do it
TIME NO 1	I did it without thinking	I thought but still did it	I thought & did it less	I didn't do it
TIME NO 1	I did it without thinking	I thought but still did it	I thought & did it less	I didn't do it
TIME NO 1	I did it without thinking	I thought but still did it	I thought & did it less	I didn't do it

Strength words obtained from:
 Strength Cards
 St. Luke's Innovative Resources
 137 McCrae Street, Bendigo 3550 Australia

Emotional control

Strength words

Each week pupils choose a strength words and working together consider and record what it means.

adventurous	contented	organised	understanding
caring	different	friendly	independent
committed	fair	hardworking	open
curious	brave	humble	playful 4
enthusiastic	co-operative	loving 3	practical
assertive	creative 2	patient	resourceful
careful 1	generous	responsible	purposeful
confident	helpful	honest	resilient
determined	humorous	wise	strong
5 energetic	happy	loyal	6 reliable
attentive	hopeful	peaceful	protective
kind	imaginative	gentle	relaxed
			flexible
			encouraging
			respectful
			forgiving
			skilful
			thoughtful

Strength Word
.....

Emotional control

Positive thinking

Pupils work together on changing negative statements to positive ones.

POSITIVE THINKING

I can't - becomes - ??????

Do this as red thoughts v green thoughts

POSITIVE THINKING

I can't - becomes - I will try

Do this as red thoughts v green thoughts

POSITIVE THINKING

I can't - becomes - I will try

I'll fail - becomes -
??????????????

POSITIVE THINKING

I can't - becomes - I will try

I'll fail - becomes -
I will have a go

POSITIVE THINKING

I can't - becomes - I will try

**I'll fail - becomes -
I will have a go**

**No one likes me - becomes -
????????????????**

POSITIVE THINKING

I can't - becomes - I will try

**I'll fail - becomes -
I will have a go**

**No one likes me - becomes -
I will make new friends**

Turn RED thoughts into GREEN ones
POSITIVE THINKING

I can't - becomes - I will try

I'll fail - becomes -
I will have a go

No one likes me - becomes -
I will make new friends

I'm no good at schoolwork - becomes -
????????????????

POSITIVE THINKING

I can't - becomes - I will try

I'll fail - becomes -
I will have a go

No one likes me - becomes -
I will make new friends

I'm no good at schoolwork - becomes -
I'm working to improve

Make a list of positive things about yourself

1 One thing I like about myself in school is

2 In school I look forward to

3 When I am at school I feel good about

4 A favourite school memory I have is

RIGHTS & RESPONSIBILITIES

THE RIGHT:

To be safe

For my property to be safe

To be treated with respect

To learn

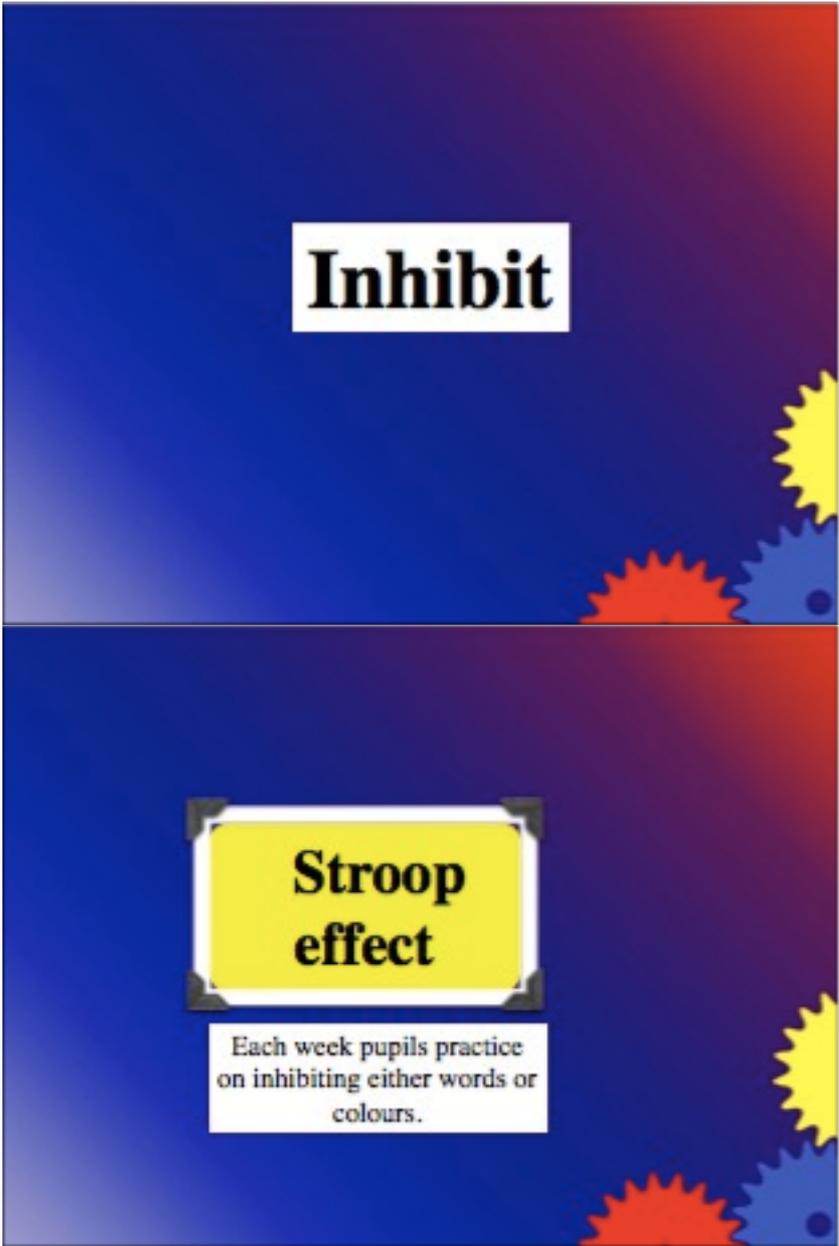
THE RESPONSIBILITY:

To not threaten others

Respect the property of others

To respect others equally

To not interfere with others learning



Inhibit

**Stroop
effect**

Each week pupils practice
on inhibiting either words or
colours.

To read the ink colour you need to ignore the word name. Can you?

RED
YELLOW
GREEN
BLUE
ORANGE

To read the ink colour you need to ignore the word name. Can you?

RED	RED
YELLOW	YELLOW
GREEN	GREEN
BLUE	BLUE
ORANGE	ORANGE

**RED BLUE WHITE RED BLUE
YELLOW BLUE GREEN RED
RED PURPLE BLACK GREEN
YELLOW BLUE ORANGE RED
PURPLE RED BROWN BLACK
BLUE YELLOW GREEN WHITE
RED PURPLE BLACK GREEN
YELLOW BLUE GREEN RED**

**RED BLUE WHITE RED BLUE
YELLOW BLUE GREEN RED
RED PURPLE BLACK GREEN
YELLOW BLUE ORANGE RED
PURPLE RED BROWN BLACK
BLUE YELLOW GREEN WHITE
RED PURPLE BLACK GREEN
YELLOW BLUE GREEN RED**

RED BLUE WHITE RED BLUE
YELLOW BLUE GREEN RED
RED PURPLE BLACK GREEN
YELLOW BLUE ORANGE RED
PURPLE RED BROWN BLACK
BLUE YELLOW GREEN WHITE
RED PURPLE BLACK GREEN
YELLOW BLUE GREEN RED

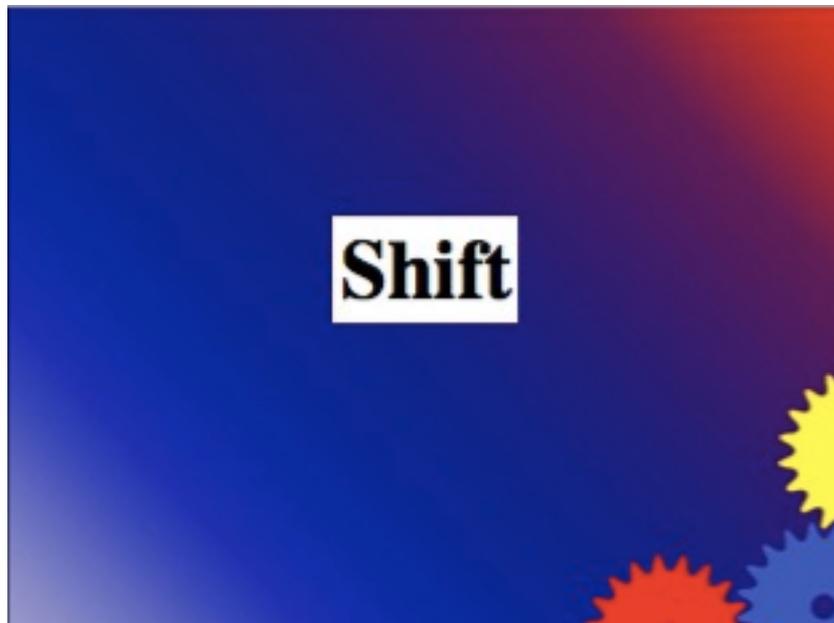
Action record

Pupils design an individual
action record

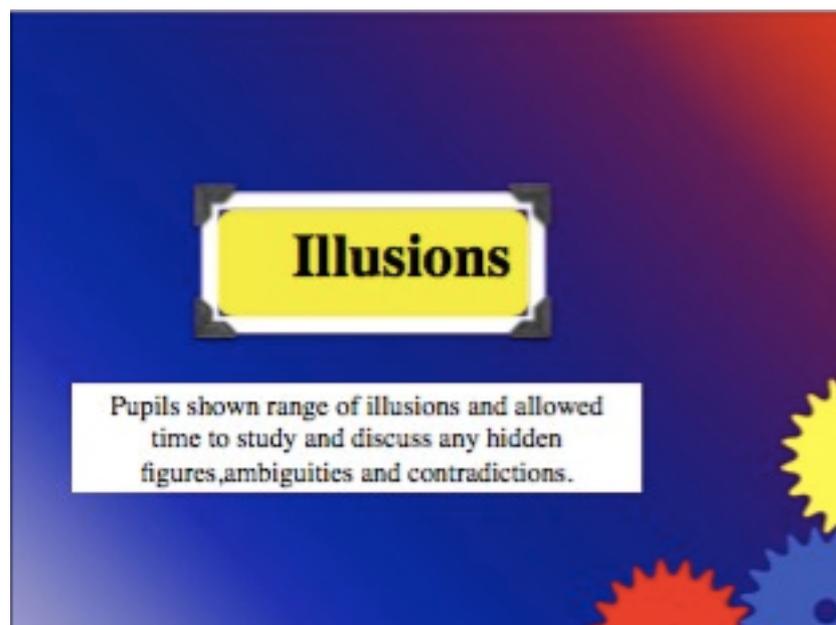
<p style="text-align: center;">THREE KEY WORDS</p> <p>1</p> <p>2</p> <p>3</p>	<p style="text-align: center;">WAYS TO RELAX</p> <p>1</p> <p>2</p> <p>3</p>
<p style="text-align: center;">FAVOURITE STRENGTH WORDS</p> <p style="text-align: center;">□ □</p> <p style="text-align: center;">□ □</p>	<p style="text-align: center;">SELF MONITORING</p> <p>1</p> <p>2</p> <p>3</p>
<p style="text-align: center;">TURN TURTLE</p> <p>1</p> <p>2</p> <p>3</p>	<p style="text-align: center;">POSITIVE THINKING "green thoughts"</p> <p>1</p> <p>2</p> <p>3</p>

R	E	S	P	O	N	S	I	B	L	E
E	F	T	V	B	N	M	R	D	U	N
S	R	R	F	L	E	X	I	B	L	E
I	I	O	E	L	B	A	I	L	E	R
L	E	N	B	D	F	I	T	S	K	G
I	N	G	P	O	S	I	T	I	V	E
E	D	P	G	D	W	H	U	K	N	T
N	L	V	O	K	I	N	D	L	B	I
T	Y	V	R	Y	I	K	A	S	R	H
C	O	O	P	E	R	A	T	I	V	E

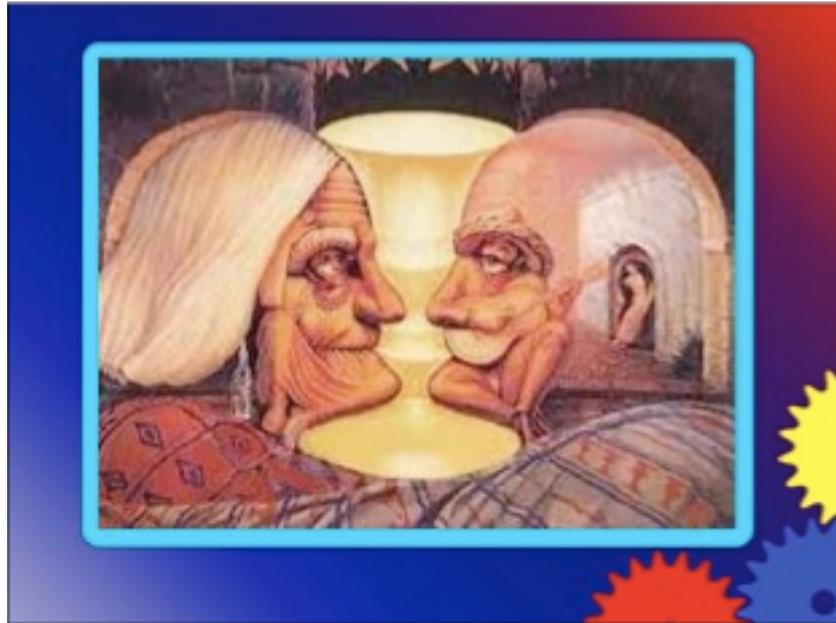
Appendix E: Example session



Illusions obtained from
<http://www.google.co.uk/images?q=illusions&hl=en-GB&gbv=2&tbn=isch&ei=IFm-U6zfHczJPcicfgJ&start=80&sa=N>









Emotional control

Problem solving

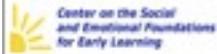
Pupils told the Turtle story and discussed how it could be used.

Tucker Turtle obtained from:
http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&sqi=2&ved=0CC4QfjAF&url=http%3A%2F%2Fcsefel.vanderbilt.edu%2Fscriptedstories%2Ftuckerturtle.ppt&ei=eoW-U8PMCKeL7Aae_oDICQ&usg=AFQjCNGyt535A3Px2-ornkOtsrrdJk_KXQ

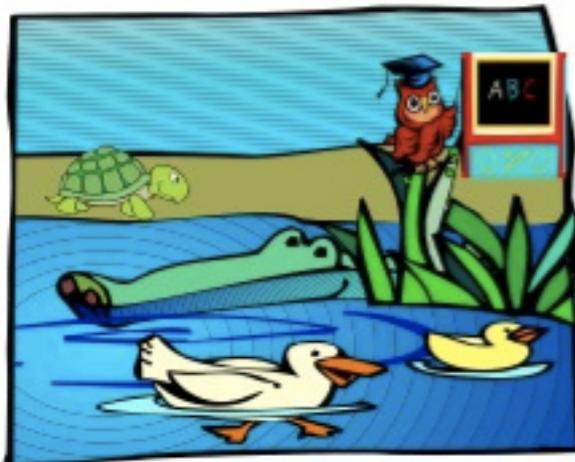


Tucker Turtle Takes Time to Tuck and Think

Created using pictures from Microsoft Clipart® and Webster-Stratton, C. (1987). The teachers and children videotape series. Olin dresser school, Seattle, WA. The Incredible Years.



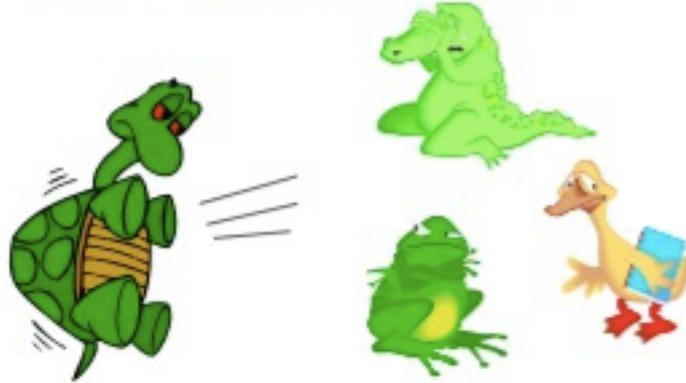
Tucker Turtle is a terrific turtle. He likes to play with his friends at Wet Lake School.



But sometimes things happen that can make Tucker really mad.



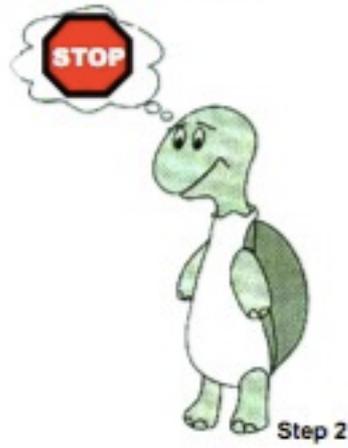
When Tucker got mad, he used to hit, kick, or yell at his friends. His friends would get mad or upset when he hit, kicked, or yelled at them.



Tucker now knows a new way to "think like a turtle"
when he gets mad.



He can **stop** and keep his hands, body, and yelling
to himself!

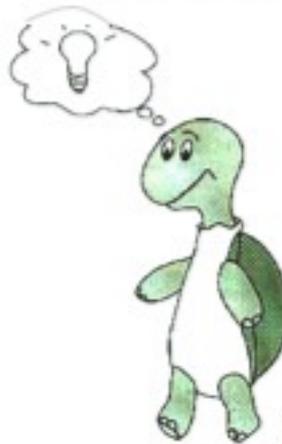


He can **tuck** inside his shell and take **3 deep breaths** to calm down.



Step 3

Tucker can then **think of a solution** or a way to make it better.



Step 4

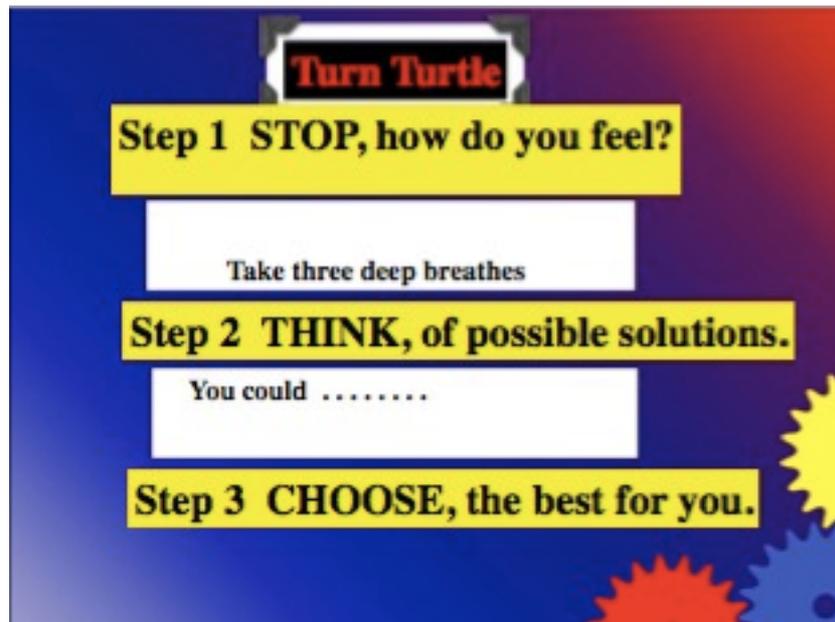


Tucker's friends are happy when he plays nicely and keeps his body to himself. Friends also like it



The End!





Turn Turtle

Step 1 STOP, how do you feel?

Take three deep breathes

Step 2 THINK, of possible solutions.

You could

Step 3 CHOOSE, the best for you.

The graphic features a blue-to-red gradient background with several interlocking gears in yellow, red, and blue at the bottom right corner.



Emotional control

Self-control

Pupils introduced to concept of self-control, and agreed a target behaviour for improvement.

The graphic features a blue-to-red gradient background with several interlocking gears in yellow, red, and blue at the bottom right corner.

Self-monitoring - observe & record

Step 1 Select and clearly define a target behaviour in school.

Step 2 Between today and the --- October, how often would you like to do the target behaviour?

Step 3 Record when ever this behaviour occurs.

Step 4 My recognition for success is

Self-monitoring - observe & record

Step 1 Select and clearly define a target behaviour in school.

Step 2 Between today and the 17th June, how often would you like to do the target behaviour?

Step 3 Record when ever this behaviour occurs.

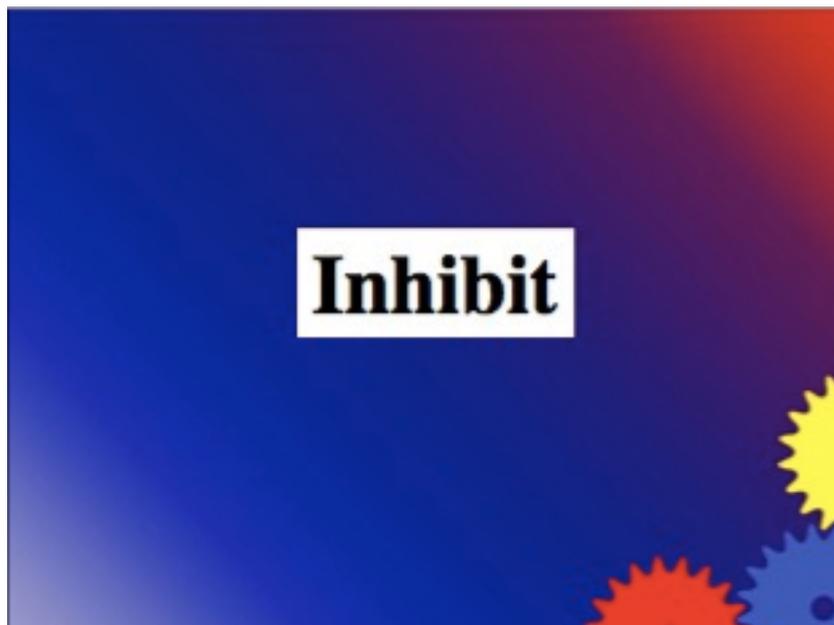
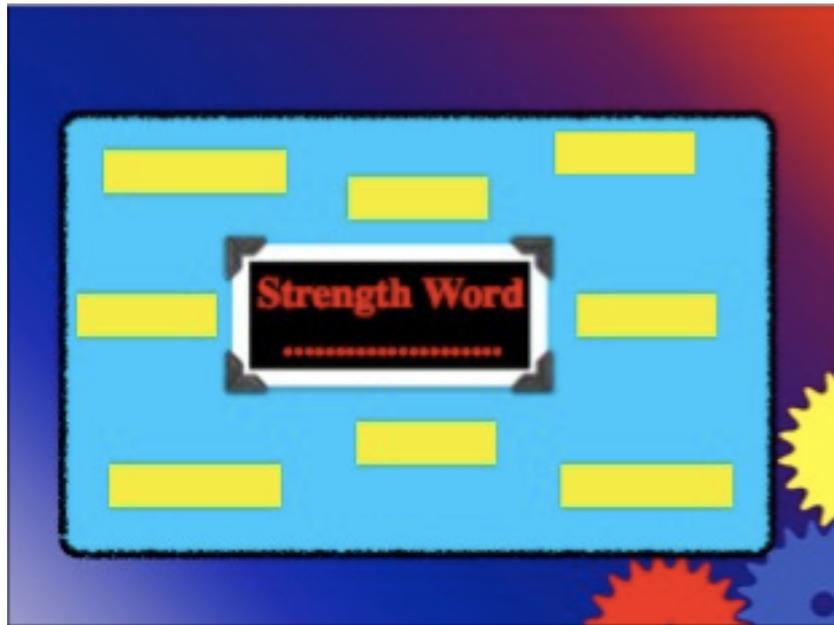
Step 4 My recognition for success is

Emotional control

Strength words

Each week pupils choose a strength words and working together consider and record what it means.

- adventurous
- caring
- committed
- curious
- enthusiastic
- assertive
- careful 1
- confident
- determined



Stroop effect

Each week pupils practice on inhibiting either words or colours.

To read the ink colour you need to ignore the word name. Can you?

RED	RED
YELLOW	YELLOW
GREEN	GREEN
BLUE	BLUE
ORANGE	ORANGE

RED BLUE WHITE RED BLUE
YELLOW BLUE GREEN RED
RED PURPLE BLACK GREEN
YELLOW BLUE ORANGE RED
PURPLE RED BROWN BLACK
BLUE YELLOW GREEN WHITE
RED PURPLE BLACK GREEN
YELLOW BLUE GREEN RED

Appendix F National curriculum scores

Raw Data Experimental group N = 29

Anonymised scores for each pupil for their DOB, reading, writing, maths and BR at T1 and T2 scores

Subject	Age	Gender	Reading	Writing	Maths	BRT1	BRT2
S1Exp	02.03.02	Boy	5	5	5	45	32
S2Exp	28.08.02	Boy	2	2	2	32	29
S3Exp	22.06.02	Boy	3	3	4	31	29
S4Exp	13.02.02	Boy	4	4	4	38	29
S5Exp	11.12.01	Girl	5	5	5	29	29
S6Exp	12.12.01	Girl	5	4	4	32	29
S7Exp	24.08.02	Boy	4	4	4	34	29
S8Exp	26.04.02	Girl	4	4	4	30	29
S9Exp	19.10.01	Girl	5	5	5	29	29
S10Exp	13.10.01	Girl	5	4	4	40	29
S11Exp	16.10.01	Girl	5	4	4	29	29
S12Exp	16.10.01	Girl	5	4	4	29	29
S13Exp	05.03.02	Girl	5	5	4	29	29
S14Exp	23.07.02	Girl	5	4	4	29	29
S15Exp	02.09.01	Girl	5	5	5	29	29
S16Exp	23.05.02	Boy	5	4	5	33	31

S17Exp	16.10.01	Girl	5	5	5	29	29
S18Exp	06.02.02	Girl	5	5	5	29	29
S19Exp	14.01.02	Boy	3	4	4	31	29
S20Exp	19.01.02	Boy	4	4	4	29	29
S21Exp	23.03.02	Boy	5	5	5	35	29
S22Exp	23.09.01	Boy	5	4	4	34	31
S23Exp	27.06.02	Girl	5	4	5	29	29
S24Exp	10.10.01	Boy	5	4	5	29	29
S25Exp	02.05.02	Boy	4	4	3	63	36
S26Exp	26.10.01	Boy	5	5	5	33	29
S27Exp	16.07.02	Boy	4	4	4	44	34
S28Exp	11.01.02	Girl	5	5	5	29	29
S29Exp	01.05.02	Boy	3	3	4	56	36

Raw Data Control group

N = 31

This table presents the anonymised scores for each pupil for their DOB, Reading, Writing, Maths and BR scores

Subject	Age	Gender	Reading	Writing	Maths	BRT1	BRT2
S1Cont	24.01.02	Girl	5	4	4	50	38
S2Cont	22.02.02	Boy	4	4	5	32	29

S3Cont	26.02.02	Boy	4	4	4	42	37
S4Cont	16.11.01	Girl	5	5	5	33	29
S5Cont	18.08.02	Boy	4	4	5	65	55
S6Cont	15.10.01	Boy	4	4	4	29	29
S7Cont	13.05.02	Girl	5	4	5	29	29
S8Cont	14.11.01	Boy	5	5	5	29	29
S9Cont	19.07.02	Boy	5	5	5	29	29
S10Cont	25.07.02	Boy	5	4	4	34	30
S11Cont	17.04.02	Girl	5	4	4	29	29
S12Cont	19.05.02	Boy	5	5	5	30	29
S13Cont	28.11.01	Girl	5	4	4	31	29
S14Cont	27.11.01	Boy	5	5	5	29	29
S15Cont	10.01.02	Boy	4	4	5	40	48
S16Cont	30.08.02	Boy	5	4	5	36	39
S17Cont	08.12.01	Boy	5	5	5	30	30
S18Cont	26.06.02	Girl	4	4	4	32	29

S19Cont	02.10.01	Girl	5	5	4	29	29
S20Cont	15.02.02	Boy	4	4	4	29	29
S21Cont	17.08.02	Girl	5	5	5	45	35
S22Cont	10.04.02	Girl	5	5	5	65	52
S23Cont	29.09.01	Girl	2	3	2	38	38
S24Cont	09.07.02	Boy	5	4	4	40	53
S25Cont	06.09.01	Boy	5	4	5	32	31
S26Cont	06.10.01	Boy	5	5	5	31	30
S27Cont	29.09.01	Girl	4	4	4	29	32
S28Cont	21.05.02	Girl	5	4	5	29	32
S29Cont	03.07.02	Girl	2	3	3	29	32
S30Cont	24.04.02	Boy	5	4	5	37	37
S31Cont	24.04.02	Boy	5	4	5	29	29

Appendix G1: Gatekeeper letter to headteacher



School of Psychology, Cardiff University

Dear Headteacher,

I am a qualified Educational Psychologist studying for a Doctorate in Educational Psychology. As part of my course I am carrying out a research project. The project is investigating how key classroom behaviour skills can be taught to pupils using a whole class approach.

I am writing to enquire whether you would be willing to allow me give me to ask three of your KS6 teachers to complete a questionnaire twice on each of their pupils. I am also seeking permission to work with one class for a period of six weeks for thirty minutes per session. During this session the pupils will be engaged in activities aimed at improving essential skills for behaviour and learning success in the classroom.

I aim to cause as little disruption to the school day as possible, therefore would be happy to undertake these sessions at the most convenient time for the teachers involved.

If you are willing for the research to proceed, I can visit the school during a school briefing (or any other convenient time) to explain the project further, answer any questions and to distribute the questionnaires.

Full ethical approval has been granted by Cardiff University. I, Rob Long, will conduct the project under the supervision of Dr. Simon Griffey, Professional Tutor DEdPsy Training Programme (full contact details below).

The name of the local authority, the name of the school and the names of the individuals

involved in the research will remain anonymous throughout the study. The information gathered through the questionnaires will be anonymised so that the information cannot be traced back to the individuals involved. Each participant will be informed that they can withdraw from the project, at any time, without giving a reason. I attach a letter to be sent to each of the parents/carers/social workers of each child, explaining this project. Should they wish to opt out of the project either at the start or at a later date a return letter would facilitate this action.

Please could you provide permission for me to distribute questionnaires to the teachers and to work with one class as outlined above.

In addition could you please provide a named member of staff, with whom I can liaise throughout the project. I will follow up this letter with a telephone call, within one week after sending you this letter.

If you would like any additional information regarding the project or would like to discuss any issues, please do not hesitate to contact me using the contact details below.

Many thanks in advance for your consideration of this project.

Regards,

Rob Long

Chartered Educational Psychologist

Contact details:

Chartered Educational Psychologist,

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email:

LongRJ@cardiff.ac.uk

Rob Long,

School of Psychology, Cardiff

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email:

psychethics@cf.ac.uk

Supervisor:

Dr. Simon Griffey,

Professional Tutor, DEdPsy. Training Programme, School of Psychology, Cardiff

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email:

Simon Griffey griffeysj@Cardiff.ac.uk

Appendix H: Information, consent and opt out letters

H1: Information and consent letter to Class Teacher



School of Psychology, Cardiff University

Dear Class teacher,

I am a qualified Educational Psychologist studying for a Doctorate in Educational Psychology. As part of my course I am carrying out a research project. The project is investigating how key classroom behaviour skills can be taught to pupils. These skills involve Response Inhibition, Emotional Control and Transition. These are skills that all children need to be successful in the classroom. My project is investigating whether they can be taught to a whole class.

I am writing to enquire whether you would be willing to participate in the project. It would involve you completing a questionnaire (29 questions) on each of your pupils, twice).

After the questionnaire has been completed one of the YR6 classes will be randomly chosen. This group will then have six input sessions, led by myself for thirty minutes on activities to strengthen/develop these skills.

The questionnaire will then be completed again and the data analysed for any significant difference between the groups

I wish to cause as little disruption to the school day as possible, therefore would be happy to undertake these sessions at the most convenient time for the teacher involved.

If you are willing for the research to proceed, I can visit the school during a school briefing (or any other convenient time) to explain the project further, answer any questions and to distribute the questionnaires.

I will be sending letters to the homes of the children in each YR6 class, asking for permission for each child to be involved in this project. I will also, when appropriate, meet with each class to explain the project to the children and seek their consent. Arrangements will be made for any child who does not wish to take part.

Full ethical approval has been granted by Cardiff University. I, Rob Long, will conduct the project under the supervision of Dr. Simon Griffey, Professional Tutor, DEdPsy Training Programme (full contact details below).

The name of the local authority, the name of the school and the names of the individuals involved in the research will remain anonymous throughout the study. The information gathered through the questionnaires will be anonymised so that the information cannot be traced back to the individuals involved.

Should you need to withdraw from the project at anytime you would not be expected to give a reason.

Could you please let your Head Teacher know if you would like to take part in this project.

If you would like any additional information regarding the project or would like to discuss any issues, please do not hesitate to contact me using the contact details below.

Many thanks in advance for your consideration of this project.

Regards,

Rob Long

Chartered Educational Psychologist

Contact details:

Chartered Educational Psychologist,

Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029

20875393 Email: LongRJ@cardiff.ac.uk

Rob Long,

School of

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email: psychethics@cf.ac.uk

Supervisor: Dr. Simon Griffey,
Professional Tutor, DEdPsy. Training Programme, School of Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email: Simon.Griffey@Cardiff.ac.uk

H2: Home Information and opt out form



School of Psychology, Cardiff University

RESEARCH PROJECT INTO CLASSROOM SKILLS FOR SUCCESSFUL LEARNERS

Information Sheet for Home

I am a student at Cardiff University my project concerns developing skills that would help all children in the classroom to be successful learners. I would like to invite your son/daughter to take part in the project.

What are the classroom skills I will focus on?

Some of the key skills needed by every pupil in the classroom are the ability to:

Stay focused on a task, and not to be distracted.

Stay on a task, despite being frustrated or a little anxious.

Change attention from one task to another when asked to.

Why am I doing the research?

The reason I am doing this project is that there is very little evidence into how successfully a whole class can be taught these key skills. So this project will help your teachers develop ways of supporting a whole class. This will help all pupils to be successful learners and will be efficient use of a teacher's time.

Who is being invited to participate and what will it involve?

Each of the classes in Year 6 in your child's school is being invited to join in this project.

What if I don't want my son/daughter to take part?

You are, of course, free to choose not to allow your son/daughter take part in the study. If you do agree, one of the classes will be chosen to have short activity sessions to help develop these skills.

You can choose to stop your son/daughter being in the study at any time and this will mean that they will be out of the class when the activity sessions take place.

Confidentiality

When I write up the project all names will be excluded so that no one can ever be identified. All the paperwork will be kept safe, in a locked filing cabinet. In the future the study may be published in some journals. Following data protection guidelines.

About me

I live locally, near Totnes, and have worked for Devon Education Authority in schools for many years. I am studying at Cardiff University, and this project is part of my course.

Thank you for reading this sheet.

In the case of complaints, please contact: Psychology Ethics Committee Secretary Cardiff University Tower Building Park Place Cardiff, CF10 3AT Tel: 029 20874007 Email: psychethics@cf.ac.uk

Opt Out Form



School of Psychology, Cardiff University

RESEARCH PROJECT INTO CLASSROOM
SKILLS FOR SUCCESSFUL LEARNERS

Participation Opt Out Form

You need only complete this form and return it to your child's school if you DO NOT wish your child to participate in all or part of the study

PLEASE NOTE: IF YOU DO NOT RETURN THE FORM, YOUR CHILD
WILL AUTOMATICALLY BE INCLUDED IN THE STUDY.

	Please initial
I confirm that I have read and understood the participant information sheet for the above study. I have had the opportunity to consider the information,	

ask questions and have had these answered satisfactorily.	
I understand that participation is voluntary and that I would be free to withdraw my child at any time, without giving a reason.	

If you ARE NOT willing for your child to take part in any of the class sessions please initial here and return the form to the class teacher.

Name of child

Name of parent/guardian

Signature Date

Thank you. Rob Long

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email: psychethics@cf.ac.uk

H3: Information and opt out sheet for pupils



School of Psychology, Cardiff University

RESEARCH PROJECT INTO CLASSROOM SKILLS FOR SUCCESSFUL LEARNERS

Information and opt out sheet for pupils

Would you consider taking part in a project?

I am planning to do a project into developing skills that will help learners in the classroom and would like to invite you to take part.

Who will it help?

This project will help you in your classroom and it will help your teacher. Later the ideas would be used to help other children in your school. It will also help me succeed on my course.

What are the classroom skills I will focus on?

Some of the key skills needed by every pupil in the classroom are the ability to:

stay focused

stick at it

solve problems

Why am I doing the research?

This project will help your teachers develop ways of supporting their class. This will help

everyone learn more.

Who is being invited to join this project?

Each of the classes in Year 6. If you would like to join, I will come and talk to your class about it with your teacher present so that you can ask me any questions you may have about this project.

What if you don't want to take part?

You can choose not to take part in the study.

If you do agree, one of the classes will be chosen to have short sessions on activities to help learn new skills.

You can choose to stop being in the study at any time and this will mean that you will not be in the class when the sessions take place.

Confidentiality

This means that when I write up the project no one's names will be used so that will mean no one can be identified.

I will welcome any suggestions about the project that you think would help.

About me

I live locally, near Totnes, and have worked for Devon in schools for many years. I am studying at Cardiff University, and this project is part of my course.

Contact Information

If you would like more information about the project or would like to have a chat with me about it before deciding please let your class teacher know.

Thank you for reading this sheet.

Rob Long

My Cardiff University Email: LongRJ@cardiff.ac.uk

University approval

This project has been considered by a special group at the university and has been approved.

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT.

Tel: 029 20874007 Email: psychethics@cf.ac.uk

Appendix I: Teacher assessment scores for experimental and control groups at T1 and T2

Teacher Questionnaire information



Teacher Questionnaire

Instructions

Thank you for agreeing to complete the following questionnaire for each of your pupils. Please name the pupil on the questionnaire and allocate a Subject number to them, (S1)

When you carry out the questionnaire for the second time, please ensure that they have the same Subject number.

Before the forms are collected in, can you please cut along the dotted line. This will ensure anonymity. I will have the data from your class, but the data will not be able to be matched to any individual pupil.

Thank you for your assistance.

Rob Long

Anonymised scores for each pupil for their DOB, BR at T1 and T2 scores

Experimental group

Subject	Age	Gender	BRT1	BRT2
S1Exp	02.03.02	Boy	45	32
S2Exp	28.08.02	Boy	32	29
S3Exp	22.06.02	Boy	31	29
S4Exp	13.02.02	Boy	38	29
S5Exp	11.12.01	Girl	29	29
S6Exp	12.12.01	Girl	32	29
S7Exp	24.08.02	Boy	34	29
S8Exp	26.04.02	Girl	30	29
S9Exp	19.10.01	Girl	29	29
S10Exp	13.10.01	Girl	40	29
S11Exp	16.10.01	Girl	29	29
S12Exp	16.10.01	Girl	29	29
S13Exp	05.03.02	Girl	29	29
S14Exp	23.07.02	Girl	29	29
S15Exp	02.09.01	Girl	29	29
S16Exp	23.05.02	Boy	33	31
S17Exp	16.10.01	Girl	29	29
S18Exp	06.02.02	Girl	29	29
S19Exp	14.01.02	Boy	31	29
S20Exp	19.01.02	Boy	29	29
S21Exp	23.03.02	Boy	35	29

S22Exp	23.09.01	Boy	34	31
S23Exp	27.06.02	Girl	29	29
S24Exp	10.10.01	Boy	29	29
S25Exp	02.05.02	Boy	63	36
S26Exp	26.10.01	Boy	33	29
S27Exp	16.07.02	Boy	44	34
S28Exp	11.01.02	Girl	29	29
S29Exp	01.05.02	Boy	56	36

Raw Data Control group

N = 31

This table presents the anonymised scores for each pupil for their DOB, and BR scores at T1 and T2

Subject	Age	Gender	BRT1	BRT2
S1Cont	24.01.02	Girl	50	38
S2Cont	22.02.02	Boy	32	29
S3Cont	26.02.02	Boy	42	37
S4Cont	16.11.01	Girl	33	29
S5Cont	18.08.02	Boy	65	55
S6Cont	15.10.01	Boy	29	29
S7Cont	13.05.02	Girl	29	29
S8Cont	14.11.01	Boy	29	29
S9Cont	19.07.02	Boy	29	29
S10Cont	25.07.02	Boy	34	30
S11Cont	17.04.02	Girl	29	29
S12Cont	19.05.02	Boy	30	29
S13Cont	28.11.01	Girl	31	29

S14Cont	27.11.01	Boy	29	29
S15Cont	10.01.02	Boy	40	48
S16Cont	30.08.02	Boy	36	39
S17Cont	08.12.01	Boy	30	30
S18Cont	26.06.02	Girl	32	29
S19Cont	02.10.01	Girl	29	29
S20Cont	15.02.02	Boy	29	29
S21Cont	17.08.02	Girl	45	35
S22Cont	10.04.02	Girl	65	52
S23Cont	29.09.01	Girl	38	38
S24Cont	09.07.02	Boy	40	53
S25Cont	06.09.01	Boy	32	31
S26Cont	06.10.01	Boy	31	30
S27Cont	29.09.01	Girl	29	32
S28Cont	21.05.02	Girl	29	32
S29Cont	03.07.02	Girl	29	32
S30Cont	24.04.02	Boy	37	37
S31Cont	24.04.02	Boy	29	29

Appendix J: Rater consistency questions

The lesser number is subtracted from the greater number.
 The differences are summed for each subject.
 The mean is found for the group.

N S O

- 27 Mood changes frequently
- 26 Has out bursts for little reason

- 36 Leaves work incomplete
- 39 Has trouble finishing tasks (chores, homework)

- 42 Interrupts others
- 43 Is impulsive

- 45 Gets out of the seat at the wrong times
- 9 Needs to be told “no” or “stop that ”

- 46 Is unaware of own behaviour when in a group
- 65 Does not realise that certain actions bothers others

- 47 Gets out of control more than friends
- 58 Has trouble putting the brakes on his/her actions

- 48 Reacts more strongly to situations than other children
- 66 Small events trigger big reactions

- 55 Talks or plays too loudly
- 57 Acts too wild or “out of control”

- 57 Acts too wild or “out of control”
- 46 Is unaware of own behaviour when in a group

- 69 Does not think of consequences before acting
- 65 Does not realise that certain actions bother others

Mean inconsistency score for experimental group	Protocol classification
3.6	Acceptable

Mean inconsistency score for control group	Protocol classification
4.2	Acceptable

Appendix K: Pupil rating of sessions

S1Exp(B)T1.

Total score for pupils rating of six sessions

Session 1	a little			a lot			
	1	2	3	4	5	6	7

Student Code	Rating
S1Exp(B)	39
S2Exp(B)	42
S3Exp(B)	34.5
S4Exp(B)	41
S5Exp(B)	35
S6Exp(B)	25
S7Exp(B)	27
S8Exp(B)	27
S9Exp(B)	34.5
S10Exp(B)	20
S11Exp(B)	24
S12Exp(B)	29
S13Exp(B)	36
S14Exp(B)	38
S15Exp(B)	41
S16Exp(B)	37
S17Exp(B)	41
S18Exp(B)	40
S19Exp(B)	40
S20Exp(B)	27
S21Exp(B)	26
S22Exp(B)	21
S23Exp(B)	25
S24Exp(B)	30
S25Exp(B)	33
S26Exp(B)	33
S27Exp(B)	18
S28Exp(B)	38
S29Exp(B)	40

Total 942

Possible sessions $29 \times 6 = 174$

Number of absent sessions 9

Therefore 165 sessions rated

$$\text{Mean} = \frac{\text{Rating total}}{\text{No. sessions}} = \frac{942}{165} = 5.7$$

Appendix L: Debriefing information

Appendix L1: Head teacher debrief information



Headteacher debrief form

School of Psychology, Cardiff University Debrief

Executive functioning skills and the proactive management of whole class behaviour.

Thank you for your support in allowing your staff to be involved in this project.

The aim of the research project was to explore whether these skills could be developed and/or strengthened using a whole class set of activities

Three KS6 classes were involved in the project. One group received six activity sessions of thirty minutes. These sessions involved a range of activities aimed at teaching the behaviour regulation skills.

All of the information gathered during the project has been anonymised and cannot be traced back to individuals who took part in the project. All of the information has been held in a safe and secure place.

Participants can ask to remove themselves from the project at any time, without giving a reason. If you would like more information about the project you may contact the researcher.

Contact details:

Rob Long, Chartered Educational Psychologist,
School of Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT.
Tel: 029 20875393 Email: LongRJ@cardiff.ac.uk

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff
University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email:
psychethics@cf.ac.uk

Supervisor:

Dr. Simon Griffey, Professional Tutor, DEdPsy. Training Programme, School of
Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029
20875393 Email: Simon.Griffey@Cardiff.ac.uk

L2: Pupil debrief information



School of Psychology, Cardiff University Debrief

RESEARCH PROJECT INTO CLASSROOM SKILLS FOR SUCCESSFUL LEARNERS

Thank you for taking part in this project.

You have helped explore how these key skills could be developed.

Year 6 classes were involved in the project. One group received six sessions of thirty minutes teaching. These sessions involved a range of activities aimed at teaching the classroom skills.

All of the information gathered during the project used no ones name and cannot be traced back to individuals who took part. All of the information has been held in a safe and secure place.

You can ask to remove yourself from the project at any time, without giving a reason. If you would like more information about the project please contact the researcher.

Rob Long, Chartered Educational Psychologist,
School of Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT.
Tel: 029 20875393 Email: LongRJ@cardiff.ac.uk

Appendix XX Teacher debrief form

L3: Teacher debrief information



School of Psychology, Cardiff University Debrief

Executive functioning skills and the proactive management of whole class behaviour.

Many thanks for completing the questionnaire and taking part in this project. The questionnaire sought to assess where each of the pupils were on measures of behaviour regulation skills.

The aim of the research project was to explore whether these skills could be developed and/or strengthened using a whole class set of activities

Three KS6 classes were involved in the project. One group acted as a pilot study, another was the control group and the third was the experimental group. This group received six thirty minute activities sessions. These sessions involved a range of activities aimed at teaching the behaviour regulation skills.

All of the information gathered during the project has been anonymised and cannot be traced back to individuals who took part in the project. All of the information has been held in a safe and secure place.

Participants can ask to remove themselves from the project at any time, without giving a reason. If you would like more information about the project you may contact the researcher.

Contact details:

Chartered Educational Psychologist,

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email:

LongRJ@cardiff.ac.uk

Rob Long,

School of Psychology, Cardiff

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email: psychethics@cf.ac.uk

Supervisor:

Dr. Simon Griffey, Professional Tutor, DEdPsy. Training Programme, School of Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email: Simon Griffey griffeysj@Cardiff.ac.uk

L4: Home debrief information



School of Psychology, Cardiff University Debrief

RESEARCH PROJECT INTO CLASSROOM SKILLS FOR SUCCESSFUL LEARNERS

Many thanks for giving permission for your son/daughter to take part in this project.

The aim of the research project was to explore whether these skills could be developed and/or strengthened using a whole class set of teaching activities.

Three KS6 classes were involved in the project. One group acted as a pilot study, another was the control group and the third was the experimental group. This group received six thirty minute sessions of teaching. These sessions involved a range of activities aimed at teaching the behaviour regulation skills.

All of the information gathered during the project has been anonymised and cannot be traced back to individuals who took part in the project. All of the information has been held in a safe and secure place.

Participants can ask to remove themselves from the project at any time, without giving a reason. If you would like more information about the project you may contact the researcher.

Contact details:

Chartered Educational Psychologist,

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email:

LongRJ@cardiff.ac.uk

Rob Long,

School of Psychology, Cardiff

In the case of complaints, please contact: Psychology Ethics Committee, Secretary, Cardiff

University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20874007 Email:
psychethics@cf.ac.uk

Supervisor:

Dr. Simon Griffey,

Professional Tutor, DEdPsy. Training Programme, School of Psychology, Cardiff
University, Tower Building, Park Place, Cardiff, CF10 3AT. Tel: 029 20875393 Email:
Simon Griffey griffeysj@Cardiff.ac.uk

