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How is academic motivation in children influenced by emotional regulation?

Rosanna Pengelly

Project Advisor: [Michaela Gummerum](#), School of Psychology, Faculty of Health and Human Sciences, Plymouth University, Drake Circus, Plymouth, PL4 8AA

Abstract

Children's academic achievement is influenced by motivation. Motivation, in turn, is affected by emotional regulation and children's reactions to poor or high achievement. This study investigated academic motivation to gain an understanding of the attributions (effort, ability, difficulty and luck) made by children on their achievements in a maths test among 25 SEN children (i.e., children with emotional, behavioural and social difficulties) and 44 mainstream children. SEN children made more attributions to effort whereas mainstream children made more attributions to ability. Emotional regulation was measured using the Emotion Regulation Questionnaire (ERQ). Emotional reappraisal (i.e., reinterpreting the meaning of emotional stimuli) and suppression (i.e., a person's knowledge of their emotions) did not differ between schools. Results highlight differences in expectations of achievement between schools: Mainstream children, unlike SEN children, were more likely to want to hide their paper with the results of the maths test despite achieving higher scores in the test. This research expands knowledge of the difference in achievement attributions between academic contexts. This topic should be studied further to ultimately raise the academic motivations of SEN and mainstream children alike.

Introduction

It is known that motivation is very important for children's academic achievement. Motivation is affected by how an individual reacts when they do something well and how they react when things do not go so well. Schunk and Zimmerman (2008) examined how successful students control learning, finding that they were able to use cognitive, behavioural, emotional and motivational strategies to develop a learning process and aid the completion of academic tasks. Furthermore the research suggested previous experience of self-regulating their own learning improved achievements (Schunk & Zimmerman, 2008). Winne and Jamieson-Noel (2002) studied effective learning strategies, finding when students were unable to apply these strategies they were highly likely to give up when faced with a challenge. The ability to apply learning strategies may be influenced by motivation and is improved when children make progress in their learning, consequently maintaining self-efficacy for a better performance (Schunk, 1991). Therefore differences in motivation amongst children affect learning strategies and academic achievement.

Within schools motivation has an important influence on achievement. Pajares and Schunk (2001) discussed the concept that when children feel successful in learning they are more likely to work harder and more readily, leading to higher achievement and increased motivation. When a child has weak academic self-efficacy they doubt their learning capability, decreasing achievement and reducing motivation (Pajares & Schunk, 2001). Previous research by Pajares (1996) provided support for these claims, indicating a correlation between self-efficacy and achievement outcomes. This research specifies a relationship between high self-efficacy and high achievement where both are important in predicting performance and behaviour in children, improving mood and motivation.

Motivation in children is likely to have an indirect effect on performance and self-esteem (Slyva, 1994). Slyva (1992) identified some impacts on achievement as being aspiration, motivation and commitment whereby children with positive attributes in these areas were more likely to perform with confidence to avoid failure and placement in special education. With regards to previous findings McLeod (2012) recognised children with low self-esteem may have experienced relationships involving physical punishment and lack of affection from carers. Subsequently children tended to depend on coping strategies such as bullying, quitting, cheating and avoiding, thus creating negative behavioural difficulties in children (McLeod, 2012) and lacking motivation to achieve highly. Research by Guindon (2002) supports findings that children with low-levels of self-esteem portray characteristics such as anger, hostility, unhappiness, insecurity, and a lack of motivation. This research provides some reasons for a lack of motivation and poor academic performance in children with negative behavioural characteristics.

The ability to regulate emotions has been investigated with regards to self-esteem. Rosenberg and Owen (2001) describe people with low self-esteem as negative and frequently troubled by failure. This increases the likelihood of social anxiety, making interactions difficult and increasing pessimism towards others (Rosenberg & Owen, 2001). Donnellan, Trzesniewski, Robins, Moffitt and Caspi (2005) investigated this issue to find when there is a lack of self-esteem a child may find it difficult to regulate emotion, sometimes leading to frustration by displaying inappropriate behaviours such as aggression. Donnellan et al. (2005) asked teachers and parents to report

their children's behaviour; they found that those with low self-esteem were likely to engage in antisocial behaviours. When the antisocial behaviour scales were divided into aggressive behaviours, such as fighting or bullying, or nonaggressive behaviours, such as lying or disobedience, it was found that the effects of self-esteem were significant for both types of behaviour; thus children were unable to regulate emotions effectively (Donnellan et al., 2005). This research suggests a link between low self-esteem and poor emotional regulation; in turn affecting behaviour in schools and thus reducing academic performance in children.

Research on emotional regulation has been conducted in both home and school environments. Schanding and Nowell (2013) measured emotional regulation in children with behavioural difficulties at home and at school using parent and teacher ratings. Significant agreement between parent and teacher ratings of emotional regulation was found in both academic and home settings (Schanding & Nowell, 2013). Research conducted by Pulla, Shatte and Warren (2013) supports this claim further. It was suggested children with behavioural difficulties found it particularly difficult to regulate their emotions in an academic setting alongside the school curriculum (Pulla et al., 2013). To enable a child to regulate their emotions efficiently they need to receive the opportunity to learn how to process distress in a stable emotional environment (Pulla et al., 2013). Some positive environmental factors put forward by Pulla et al. (2013) include sufficient financial resources, neurological and emotional development, and carers with appropriate self-regulation as role models. Emotional regulation allows a child to respond appropriately to situations in an acceptable social manner enabling them to inhibit inappropriate behaviour, however if environmental factors are not met then it can lead to a display of behavioural difficulties (Pulla et al., 2013). Former research on emotional regulation in a learning context was conducted by Jarvenoja and Jarvela (2009). Students were presented with socio-emotional challenges to assess whether the emotions evoked during collaborative learning situations could be regulated as well as in an individual context (Jarvenoja & Jarvela, 2009). Students were able to regulate emotions cooperatively, giving an understanding of emotional regulation in social situations (Jarvenoja & Jarvela, 2009). This research indicates the importance for children to learn how to regulate their emotions. Considering this the following study assesses how emotions are controlled and in turn the effects on achievement attributions and motivation.

Motivation is affected by exposure to environmental stressors (Evans & Stecker, 2004). Emotional support in the home and at school is considered to benefit achievement outcomes in children (Bandura, Barbaranelli, Caprara & Pastorelli, 1996). Research by Bandura et al. (1996) highlighted the importance of emotional support in the home environment. Parental aspirations influenced achievement in an academic setting, consequently having an effect on self-efficacy in the learning environment, and therefore motivation to achieve highly (Bandura et al., 1996). Research by Curby, Rimm-Kaufman and Arby (2013) studied emotional support and effects on emotional regulation in school. It was found that providing emotional and organisational support at the beginning of an academic year improved teaching and learning; and higher levels of emotional support earlier in the year predicted higher instructional support later in the year, and vice versa (Curby et al., 2013). This research emphasizes the importance of adequate home and school environments to benefit academic achievement and motivations.

Achievement outcomes can be predicted by attributions, as assessed by Dweck, Chiu and Hong (1995). This study aimed to evaluate judgements and reactions to human actions and outcomes, as well as the attributions made (Dweck et al., 1995). They compared fixed and malleable attributes, finding different reactions were fostered depending on attributions. Those believing in fixed intelligence were more likely to struggle when faced with a challenge, making ability attributions to performance outcomes and susceptibility to learned helplessness (Dweck et al., 1995). Those believing in malleable intelligence attributed strongly to effort and adopted mastery oriented responses (Dweck et al., 1995). Expanding this Hong, Chiu, Dweck, Lin and Wan (1999) investigated attributions of effort and ability in entity theorists (belief in fixed intelligence) and incremental theorists (belief in malleable intelligence). The assessment of implicit theories developed by Dweck and Henderson (1988) was used to measure implicit theory of intelligence. Entity theorists were more likely to attribute ability to intelligence, whereas incremental theorists were more likely to attribute effort to intelligence (Hong et al., 1999). Achievement outcomes were affected by intelligence being fixed or malleable (Hong et al., 1999). This research indicates attributions are critical in the ability to cope and predict achievement outcomes.

Attributions of achievement might be different depending on the outcome. Weiner (1979) conducted research on attributions of achievement to find successes and failures were attributed to ability, effort, difficulty and luck. When a positive outcome was achieved due to assumed ability then self-esteem was improved or maintained (Weiner, 1979). Weiner (1979) claimed this positive emotional response occurred regardless of the source of the locus. However the locus of control was proposed by Rotter (1966), emphasising the extent of which people perceive control over outcomes. These perceptions happen independently to actions due to external factors such as luck, chance or fate; or dependent on actions such as internal control (Rotter, 1966). Regardless of this Brown and Weiner (1984) developed previous work on ability versus effort by Weiner (1979) to gain a better understanding of emotional reactions to success and failure in children. When presented with different success accounts from four children participants were asked to choose which child they would rather be (Brown and Weiner, 1984). The respondents showed a clear preference towards the two high-ability/low-effort accounts (Brown & Weiner, 1984). Consistent with previous research Schunk (1991) found high ability attributions for previous successes and easy tasks generated higher expectations of success than attributions of high effort and/or good luck. This research suggests children formulate different attributions based on the outcome of a scenario.

Success and failure outcomes can generate different emotional responses, as examined by Stipek and Gralinski (1991). When comparing gender it was found girls produced more negative feelings towards their own competency and likelihood to succeed, lacking in belief that their successes were achieved through effort (Stipek & Gralinski, 1991). Girls had less feelings of pride, and after a failure experienced more negative emotions and fear of humiliation (Stipek & Gralinski, 1991). The following study will model this research, focusing on achievement related beliefs and emotional responses to success and failure in a maths test. Attributions of failure and success within the academic environment are investigated to determine if children believe these outcomes are the result of ability or effort.

This study aims to assess academic motivation and how this is influenced by the ability to regulate emotions across SEN and mainstream environments. This will be measured by considering children's achievement related beliefs and attributions from success or failure, as well as measuring influences of emotional regulation. Firstly between schools, it is predicted there will be a difference in attributions. It is expected that SEN children will be more likely to think they will do worse than their peers, and mainstream children will believe themselves to be better at maths than their peers. Furthermore there will be a difference in emotional suppression and emotional reappraisal between schools. Secondly across both schools, it is predicted the lower the maths test score, the more likely children will want to hide their maths test paper. Additionally children who believe they are good at maths will be more likely to expect better results in comparison to others. A final assumption is children's preference to a high ability/low effort scenario regardless of the outcome. This research aims to provide better understanding of the factors affecting children's motivation and achievement attributions across and between school environments.

Method

Participants

Sixty nine (26 female and 43 male) children from two primary schools in Bournemouth with a mean age of 116.12 months (SD = 17.56 months). The test school included twenty five (2 female and 23 male) children from a Special Educational Needs School with a mean age of 125.04 months (SD = 20.97 months). All children from this school had emotional, behavioural and social difficulties; including some children with special needs such as ADHD, ASD, speech and language difficulties and specific learning difficulties. Children at this school tended to have low socioeconomic status, and included a child with English as a second language. The control sample included forty four (24 female and 20 male) children from a mainstream school with a mean age of 111.05 months (SD = 13.01 months).

Materials

The Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003) was used to measure emotional experiences and expression in the children. This is a 10-item scale designed to measure the tendency to regulate emotions in two ways; Cognitive Reappraisal (reinterpreting the meaning of emotional stimuli) consists of six items ($\alpha = .50$); and Expressive Suppression (a person's knowledge of their emotions) consists of four items ($\alpha = .46$). Answers for each item were on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scoring was kept continuous and each facet's scoring was kept separate. A further Pre-test Questionnaire modelled from research by Stipek and Gralinski (1991) was used which contained four items. This asked what score participants thought they would get in the test, how good were they at maths, how they thought they would do compared to their classmates, and how difficult maths was for them. This was carried out using a rating scale, allowing the children to say how much, or little, they agreed with the statement/question. A standardised maths test taken from BBC Bitesize based on Key Stage (Key Stage 1 and 2), the test was designed around the children and appropriate for their level of ability. Both the Key Stage 1 and 2 maths tests were addition and subtraction. A Post-test Questionnaire modelled from research by Stipek and Gralinski (1991) included seven items which asked the children what score they received, a rating of how proud and how ashamed they felt,

and how much they felt like 'hiding their paper'. The questionnaire also included questions on attributions, assessing why they believed they got their score, looking at difficulty, effort, ability, and luck. The Emotional Reactions Accounts modelled from Brown and Weiner (1984) were presented with four accounts from children who have either succeeded or failed in a test. They were then asked 'which child would you rather be?'

Design and Procedure

An independent measures design was used with an experimental sample and control sample. The participants were assessed individually in the test school, and in groups of 2-4 in the control school between 9.00am and 3.00pm during assessment week so as to not put extra stress and strain on children having to take a maths test. The participants were taken out of class. They sat with the experimenter and each questionnaire was handed to them one at a time when they indicated they were ready in order to reduce stress. The experimenter explained what they would be required to do during the assessment and participants were reminded they were able to withdraw at any time. None did so.

The children were firstly given the Emotion Regulation Questionnaire (ERQ). They were asked to rate on a scale of one to seven how much/little they agreed with the statement. A further Pre-test Questionnaire was then given to the children where they had to rate how much/little they agreed with the statement. The children were then presented with a standardised maths test which was completed individually in test conditions (if needed the child was assisted with reading the questions), there was no time limit on the test and the participants were told they could leave an answer blank if they did not know the answer.

Exactly 1 week after the maths test the children had their papers returned to them, they were then required to complete the Post-test Questionnaire. The children had to rate how much/little they agreed with the statements in the questionnaire. The children were then presented with the Emotional Reactions Accounts from four children who completed the same maths test as they did last week. The accounts asked the children to choose between two children who achieve a higher score due to effort or ability, and between two children who achieve a lower score due to effort or ability.

Once the experimenter had collected the questionnaires from the participants the purpose of the experiment was explained.

Results

Pre-test and Post-test Questionnaire

Descriptive statistics from the Pre-test and Post-test Questionnaire are given in Table 1. Table 1 demonstrates children in both schools had similar confidence levels in their ability, and similarly rated how difficult they thought maths was. The SEN children were prouder of their results, but had lower expectations of themselves when predicting the score they would achieve in the maths test. 48% of children in the SEN school expected to gain a score of less than 70%, however in the mainstream school 38% expected to gain a score of less than 70%. When comparing scores the of what the SEN children expected to achieve, and what they actually achieved it was shown that 40% expected a score of 4-7 out of 10, yet 52%

of the children actually achieved this score. The mainstream children had much higher expectations of themselves however 18.2% achieved a score of 0-3 out of 10 when none had expected this. Overall the mainstream children did better in their maths tests with 50% gaining a score above 80% compared to 32% of the SEN school scoring above 80%. However the mainstream children were more ashamed of their results in the test. 59.1% wanted to hide their paper from others, compared to 44% of children in the SEN school. With regards to attribution, the mainstream children made more attributions to their ability in maths, whereas the SEN children attributed more towards effort. There was little difference in the attribution of luck between schools.

Table 1: Mean and standard deviation of scores on the Pre-test and Post-test Questionnaires in the SEN and mainstream schools (n=69).

	SEN School (n=25)		Mainstream School (n=44)	
	M	SD	M	SD
Pretest2: how good are you at maths?	5.6	1.61	5.7	1.30
Pretest3: how do you think you will do in comparison to others?	4.8	1.73	4.9	1.92
Pretest4: how difficult do you find maths?	5.2	1.84	5.4	1.88
Posttest2: how do you feel about your maths score?	4.9	2.01	3.9	2.37
Posttest4: how difficult did you find the test?	4.3	1.84	3.8	2.51
Posttest5: how much effort did you put in to achieving your score?	5.6	1.61	4.3	1.92
Posttest6: how likely is it that your score is down to ability?	4.8	1.51	5.6	1.78
Posttest7: how likely is it that your score is down to luck?	4.7	1.38	4.3	4.46

An independent-samples t-test was conducted to compare the attributions made by the SEN and mainstream children. There was a significant difference in how much effort the children put into achieving their score in the SEN school (M=5.6, SD=1.61) and the mainstream school (M=4.3, SD=1.92); $t(67)=2.87, p=.006$. These results suggest that there is a difference in the amount of effort put into achieving a score. SEN children attributed more towards effort than those in the mainstream school. There was not a significant difference in ability attributions between the SEN school (M=4.8, SD=1.51) and the mainstream school (M=5.6, SD=1.78); $t(67)=-1.91, p>.05$. These results suggest that there is no difference in the attribution of ability between schools. The children's belief that the score they got was down to ability is similar in both schools. There was not a significant difference in how much the children thought their score was down to luck in the SEN school (M=4.7, SD=1.38) and the

mainstream school ($M=4.3$, $SD=2.23$); $t(67)=.69$, $p>.05$. These results suggest there is no difference in the attribution of luck between schools, concluding that the children's belief that the score they achieved was down to luck was similar in both schools.

A one-way between-subjects ANOVA was conducted to compare the effect of effort put into achieving a score on a maths test in the SEN and mainstream school. There was not a significant difference when comparing effort and actual achievement between the schools, $F(2, 63)=.76$, $p>.05$. However there is a significant difference between school and effort, $F(1, 63)=9.01$, $p=.004$; SEN children showed a preference towards attributing effort. These results suggest that there is a difference in the attribution of effort between schools, independent of the actual achievement in the maths test. A second one-way between-subjects ANOVA was conducted to compare the effect of ability when achieving a score in a maths test in the SEN and mainstream school. There was not a significant difference when comparing ability and actual achievement between the schools, $F(2, 63)=1.98$, $p>.05$. However there is a significant difference between school and ability, $F(1, 63)=4.31$, $p=.042$; mainstream children showed a preference towards attributing ability. These results suggest that there is a difference in attribution of ability between schools, independent of the actual score achieved in the maths test. A final one-way between-subjects ANOVA was conducted to compare the attribution of luck when achieving a score in a maths test in the SEN and mainstream school. There was no significant difference when comparing luck and actual achievement in the test, $F(2, 63)=1.28$, $p>.05$. These results suggest that there is no difference in the attribution of luck between schools when considering actual achievement.

Post-hoc tests using the Bonferroni correction revealed that there was a significant difference for the scores 4-7 out of 10 and 8-10 out of 10 when attributing the score to luck, $p=.000$. The post-hoc tests therefore give a more detailed statistical account of this data, it can be concluded that when children achieved a higher score in the maths test they attributed their score to luck, however those who gained a low score in the test did not significantly attribute towards luck. Those children who gained a higher score in the test believed themselves to be luckier, compared to children who gained a low score.

A chi-square test of independence was performed to examine the relation between how much the children felt like hiding their paper and schools. There was no difference between how much children felt like hiding their paper and the school, $\chi^2(1, n=69)=1.46$, $p>.05$. Children felt like hiding their papers similarly in the SEN and mainstream school. A Spearman's rank-order correlation was run to determine the relationship between actual achievement in the maths test and how much the children felt like hiding their paper. In the SEN school there was a strong, positive correlation, which was statistically significant ($r_s(23)=.431$, $p=.032$). In the mainstream school there was also a strong, positive correlation, which was statistically significant ($r_s(42)=.458$, $p=.002$). These results suggest that the lower the score achieved in the maths test, the more the children felt like hiding their paper from others. The correlation is in the same direction for the SEN and mainstream schools ($r_s(67)=.415$, $p=.000$), showing a positive relationship between maths score and hiding of maths papers in children.

An independent-samples t-test was conducted to compare how good the children believed themselves to be at maths across the SEN and mainstream schools. There was not a significant difference in the children's belief in ability in the SEN school ($M=5.6$, $SD=1.61$) and the mainstream school ($M=5.7$, $SD=1.30$); $t(67)=-.29$, $p>.05$. These results suggest that there is no difference between schools in the children's belief at how good they thought they were at maths, concluding that children's belief in ability is similar in both schools. A chi-square test of independence was performed to examine the relation between the score each child believed they would achieve and school. There was no significant difference between the score each child believed they would get and the school, $X^2(2, n=69)=3.77$, $p>.05$. Children in the SEN and mainstream school believed they would achieve similar scores in the maths test. A further chi-square test of independence was performed to examine the relation between actual achievement and school. There was no difference between actual achievement in the test and the school, $X^2(2, n=69)=2.89$, $p>.05$. Children in the SEN and mainstream school achieved similar results in the maths test.

A Pearson product-moment correlation coefficient was computed to assess the relationship between how good the children thought they were at maths, and how they thought they would do in comparison to others. In the SEN school there was no correlation between the two variables, $r=.225$, $n=25$, $p>.05$. Overall there seemed to be no relationship between how good the children thought they were at maths and how they thought they would do in comparison to others. In the mainstream school there was a strong, positive correlation between the two variables, $r=.382$, $n=44$, $p=.010$. These results suggest that in the mainstream school there was a positive relationship between how good the children thought they were at maths and how they thought they would do in comparison to others.

Emotional Reaction Accounts

The frequencies from the Emotional Reaction Accounts are given in Table 2. Table 2 shows in the good outcome scenario; children in the SEN school did not have much of a preference towards high ability/low effort or low ability/high effort. These results suggest that when children in the SEN school score higher in the test there is little difference in their attributions. In comparison, the mainstream children had a preference towards low ability/high effort rather than high ability/low effort. These results suggest that when children in the mainstream school score higher in the test they attribute more to effort than ability. In the poor outcome scenario, children in the SEN and mainstream school had a preference towards low ability/high effort, whereas across both schools there was a lower preference towards high ability/low effort. These results suggest that when the children score lower in the test they attribute more to effort than ability.

A chi-square test of independence was performed to examine the relation between high ability/low effort and low ability/high effort in the good outcome scenario between the SEN and mainstream school. There was no significant difference between high ability/low effort and low ability/high effort in the good outcome scenario in both schools, $X^2(1, n=69)=1.60$, $p>.05$. Children in the SEN and mainstream school chose similarly when considering ability and effort in the good outcome scenario. A further chi-square test of independence was performed to examine the relation between high ability/low effort and low ability/high effort in the poor outcome scenario between the SEN and mainstream school. There was no significant difference between high ability/low effort and low ability/high effort in the

poor outcome scenario in both schools, $X^2(1, n=69)=.05, p>.05$. Children in the SEN and mainstream school chose similarly when considering ability and effort in the poor outcome scenario.

Table 2: Percentage frequencies of answers chosen in the Emotional Reaction Accounts in the SEN and mainstream schools (n=69).

	SEN School (n=25)	Mainstream School (n=44)
Good outcome (8/10)		
High ability/low effort	52%	36.4%
Low ability/high effort	48%	63.6%
Poor outcome (3/10)		
High ability/low effort	32%	29.5%
Low ability/high effort	68%	70.5%

Emotion Regulation Questionnaire

An independent-samples t-test was conducted to compare emotional reappraisal in the ERQ between the SEN school and mainstream school. There was not a significant difference in emotional reappraisal for the SEN school (M=23.6, SD=7.28) and the mainstream school (M=23.0, SD=6.17); $t(67)=.38, p > .05$. These results suggest there is no difference in emotional reappraisal between the SEN and mainstream school, concluding that children's' emotional response is interpreted similarly in both schools.

A second independent-samples t-test was conducted to compare emotional suppression in the ERQ between the SEN school and mainstream school. There was not a significance in emotional suppression for the SEN school (M=16.0, SD=6.57) and the mainstream school (M=15.5, SD=4.86); $t(67)=.39, p > .05$. These results suggest there is no difference in emotional suppression between the SEN and mainstream school; ultimately children suppress and hide their emotions from others similarly in both schools.

A Spearman's rank-order correlation was run to determine the relationship between how children felt about their score and emotional suppression. In the SEN school there was not a significant correlation ($r_s(25)=.099, p>.05$), furthermore in the mainstream school the correlation was not significant ($r_s(44)=-.220, p>.05$). In the SEN school these results suggest there is a positive relationship between how

children feel about their score and emotional suppression, however in the mainstream school there is a negative relationship between how children feel about their score and emotional suppression.

Another Spearman's rank-order correlation was run to determine the relationship between how children felt about their score and emotional reappraisal. In the SEN school there was not a significant correlation ($r_s(25)=.222, p>.05$), furthermore in the mainstream school the correlation was not significant ($r_s(44)=-.003, p<.05$). In the SEN school results suggest a positive relationship between how the children felt about their score and emotional reappraisal, however in the mainstream school there is a negative relationship between how the children feel about their score and emotional reappraisal.

Discussion

Motivation in children often differs with regards to learning. In this study children's achievement attributions were investigated to gain an understanding of their motivation to achieve in a school environment, in particular measuring attributions of ability versus effort. Further, emotional regulation was measured to consider how motivation is affected by reactions to poor or high achievement outcomes.

As predicted there was a difference in attributions between schools, although this difference was not significant. SEN children indicated a preference toward high effort and achievement, and mainstream children indicated a preference toward high ability and achievement. High ability attributions in mainstream children were consistent with previous research by Stipek and Gralinski (1991). Results were also consistent with Brown and Weiner (1984); in the poor outcome scenario mainstream children presented a preference to low ability and high effort. This may be because the children may not have wanted to believe they did poorly due to their ability. The reason for the poor outcome was due to lack of effort, as this attribute is more malleable (Dweck et al., 1995). Overall in the good outcome scenario there was a preference toward high ability and low effort, Brown and Weiner (1984) claimed this was because children would rather not be low in ability. The attribution of luck was similar across both schools, suggesting luck is a universal and uncontrollable factor of attributions and may not contribute to achievement and motivation (Weiner, 1979).

There was support for the prediction that the lower the maths test score, the more likely the child will want to hide their paper. This relationship was positive and consistent across both schools however mainstream children felt like hiding their test papers more than SEN children. The desire to hide the maths paper after failure may indicate shame (Stipek & Gralinski, 1991). Brown and Weiner (1984) claimed shame was linked to the amount of effort put into a task, thus the lower the maths score, the more the child would want to hide their paper and the more shame experienced. Brown and Weiner (1984) provide further evidence for this, children were likely to compare themselves to others consequently increasing feelings of shame and not wanting to share their paper with others if the outcome was poor. Additionally the impacts of high achieving peers and peer pressure, particularly mainstream children, may have had a strong influence on these results. Mainstream schools present a competitive learning environment, whereas in SEN schools academic achievement may be less competitive, with overall lower achievements.

In addition to this SEN children were prouder of their achievements. Schunk and Gunn (1986) found feedback on ability improved performance considerably. This is

explained further by Pajares and Schunk (2001) considering the influence of feedback and appraisal as a persuasive source of self-efficacy. Some children may believe they can write well when actually their writing is far below average for their age (Pajares & Schunk, 2001). Pajares and Schunk (2001) highlight this in writing ability but it could be considered that this belief in ability is generalizable across subjects, such as maths. Positive feedback sustains motivation in children to achieve highly and impress teachers, thus strengthening self-efficacy (Pajares & Schunk, 2001). Schunk (1991) also stressed the benefits of positive persuasory feedback. Motivating students enhances self-belief, yet if the student fails it is likely to be temporary (Schunk, 1991). If children fail in a task they may use physiological factors, such as an increased heart rate or sweating, as a signal of anxiety, consequently interpreting these reactions as a lack of skill and decreasing motivation (Schunk, 1991). These indicators unintentionally bring the child to lower their levels of self-esteem and belief in high achievement (Schunk, 1991). Although achievement in the maths test was lower for SEN children, they were prouder of the result attained because it may have been a personal high achievement compared to a personal average. Also, due to the nature of SEN environments children are more likely to be given positive feedback and 1:1 encouragement for their achievements, increasing motivation and feelings of pride, this could explain the results collected. An additional reason for SEN children to have felt prouder of their result was because they were more expectant of low scores and likely to have been frequent low achievers in the past. This low expectation may be due to low level self-esteem and lack of motivation (Pajares & Schunk, 2001). Mainstream children were shown to have higher expectations, explaining why mainstream children were ashamed of their score irrelevant of the outcome.

Children with high expectancies of ability tend to have better self-esteem, particularly when achievement is responsible for future success, yet a choice of high ability/low effort did not provide evidence for a positive relationship between ability and self-worth (Brown & Weiner, 1984). The maths test is of little importance to the children as the score attained does not affect their academic future. If the test was to affect the future there may be a higher expectancy and need to achieve. Results support the claim that mainstream children are better at predicting their abilities, suggesting higher expectancies and self-esteem, yet there was no direct support for this prediction in SEN children. Future research should address improving self-esteem in SEN children to heighten expectation and belief in ability attributes.

The materials used in this research appear to present some complications. The ERQ did not find significant evidence in the difference of emotional reappraisal and suppression between schools. The ERQ is designed for adults, instantly presenting difficulties for the children tested. The questionnaire was challenging for all children as the questions seemed repetitive and tedious for the children to complete. During the assessment some children showed signs of frustration when completing the ERQ and at times were unable to understand the statements presented to them, despite prompting from the experimenter. Future research should attempt to use a child friendly version of the ERQ, such as ERQ-CA (Emotional Regulation Questionnaire for Children and Adolescents) assessed by Gullone and Taffe (2012) as a valid age-appropriate measure.

Following this critique, the design of the experiment should be improved to increase the validity of the data collected. To develop this research the maths test needs to be of more relevance and importance to the children. Similarly to research by Brown

and Weiner (1984) the maths test completed was not important to the children and the results achieved may not have reflected their genuine maths skill, therefore when answering the post-test questionnaire the children may not have answered truthfully how important the test result was to them. Furthermore the results in the SEN school may not be consistent due to behaviour and moods during the time of testing, particularly as the study required a follow up. Behaviour in the SEN school was very unpredictable from day-to-day; therefore external factors, such as a disagreement with a parent/carer may have affected their attitude at the time of testing, preventing completion of the questionnaires to their best potential. Additionally due to the SEN school only having a small number of girls attending fewer girls were tested, however previous research by Stipek and Gralinski (1991) considered gender differences and attributions. They found that girls were less likely to attribute effort to a good outcome, lacking in belief that success was achieved through effort (Stipek & Gralinski, 1991). Future research should consider this to see if gender and academic context both have an influence on achievement attributions.

There are some interventions to consider which may increase achievement in schools and improve motivation. Stormont and Reinke (2013) believed motivational deficits could be reduced if the correct interventions were in place. The Schoolwide Positive Behaviour Support system encouraged efforts of student academic performance, acting as a motivational instigator (Stormont & Reinke, 2013). Brown and Weiner (1984) also discussed the effectiveness of achievement-change programs. These were used to amend attributions of failure from poor ability to poor effort (Brown & Weiner, 1984). This achievement-change program also altered the emotions concurrent with failure from embarrassment to shame, thus increasing motivation to achieve higher next time in the result of failure (Brown & Weiner, 1984). These interventions have been successful in the past but should be studied further to understand the change in attributions in children dependent on outcome.

This research expands knowledge of the difference in achievement attributions between two academic contexts. The present research supports data found previously as well as finding a difference between the two schools, however this difference was not significant. Further research should be carried out to determine if there is a significant difference between contexts, such as the home and school. Additionally the difference in attributions between subject domains such as maths and verbal domains should be examined. To increase knowledge of achievement attributions future research should use genuine maths test papers which mean more to participants, such as SATs papers, thus increasing the likelihood of a truthful reaction from children about their attributions to success and failure. Further study of this topic should aim to ultimately raise the academic motivations of SEN and mainstream children alike.

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