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A study assessing Year 5 pupils' perspectives of intelligence and achievement goal orientation and how these relate to their perspective and causal explanations of success and failure

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Abstract

This case study investigated pupils' implicit perceptions of intelligence and academic goal orientations, and explored their relationship to Year 5 pupils' perspectives and causal explanations of success and failure. A quantitative and qualitative mixed methods approach was used. Participants completed questionnaires and were sorted into categories: (a) entity theorist-achievement goal orientation with avoidance, (b) entity theorist-achievement goal orientation with challenge or (c) incremental theorist-learning goal orientation. A sub-sample of six participants from groups (a) and (b) were interviewed. Perceptual reactions to success were independent of the participants' implicit theories of intelligence and their academic goal orientation. Both groups attributed effort as a causal explanation for both success and failure. Participants with incremental theorists-learning goal orientation displayed a stronger mastery-orientated pattern in response to failure compared to entity theorists, agreeing with Dweck's (1986) model.

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Introduction

The majority of students strive for academic achievement. Along the way they experience many successes and failures. Research evidence has indicated that academic success is not only influenced by ability, but also by the pupils' beliefs about their intelligence and academic goal orientation (Elliot & Dweck, 2005). The primary aim of this case study was to investigate pupils' implicit perceptions of intelligence and academic goal orientations, and explore whether these constructs were related to Year 5 pupils' perspectives and causal explanations of success and failure. I was drawn to this area of study, because I noticed that some pupils who had the ability to succeed academically were not performing as expected, and were displaying maladaptive behaviours and cognitions. This research will be valuable to me as a teacher by developing my understanding of pupils' perceptions of success and failure and how these might affect their motivation to learn. My research questions are:

1. What are pupils' implicit perceptions of intelligence and achievement goal orientation, and how are these related?
2. What are pupils' perspectives of success and failure and do they differ depending on implicit perception of intelligence and achievement goal orientation?

Literature Review

The social-cognitive theory of motivation developed by Dweck (1986) and Dweck and Leggett (1988), called Theories of Intelligence (TOI), has gained a great deal of attention in recent years regarding its link to academic achievement. Its key concept links implicit perceptions of

intelligence and achievement goal orientations to the likelihood of academic success, because they affect how individuals process information, construct representations of events and make inferences (Dweck & Leggett, 1988; Dweck, Chiu, & Hong, 1995; Gervey, Chiu, Hong, & Dweck, 1999).

Perceptions of Intelligence

In a seminal and frequently cited paper, Dweck and Leggett (1988) discussed two frameworks by which people understand their intelligence: entity theory and incremental theory. Individuals exhibiting an entity theory of intelligence believe that their intelligence is a fixed trait, we only have a certain amount of it and it is unchangeable. In contrast individuals with an incremental theory of intelligence believe that intelligence is a malleable trait; it is something that can be developed and increased.

Academic Goal Orientations

Dweck's (1986) model postulates that academic success is not directly determined by an individual's implicit theory of intelligence, but that it is mediated by a person's achievement goal orientation (Dupeyrat & Mariné, 2005). Achievement goal orientation is a person's set of beliefs that reflect the reasons why they approach and engage in academic and learning tasks (Blackwell, Dweck & Trzesniewski, 2007). A longitudinal study by Blackwell et al. (2007) followed several hundred American seventh graders (aged 12-14) across the transition to junior high school, allowing diachronic analysis and causal inferences to be made (Cohen, Morrision & Manion, 2007). Blackwell et al. (2007) found that individuals who believed their intelligence to be a fixed trait (entity theory) focused on performance goals. Consequently, they valued competence validation at the expense of learning something new. They strived to succeed, avoid failure, avoid negative evaluations of their intelligence and prove their ability by gaining positive judgements of their intelligence. In contrast, those who believed that their intelligence was malleable (incremental theory) focused on learning goals. They were not afraid of failing at the expense of learning something new and strived to increase their competence by developing their ability through learning and mastering new challenges. Earlier work by Bandura and Dweck (1985) and Dweck and Leggett (1988) also supports these findings.

Response to failure

Dweck and Leggett (1988) posed that implicit self-theories of intelligence coupled with their accompanying goal orientation create two distinct behavioural and cognition patterns termed helpless-orientated pattern and mastery-orientated pattern. Figure 1 outlines these patterns.

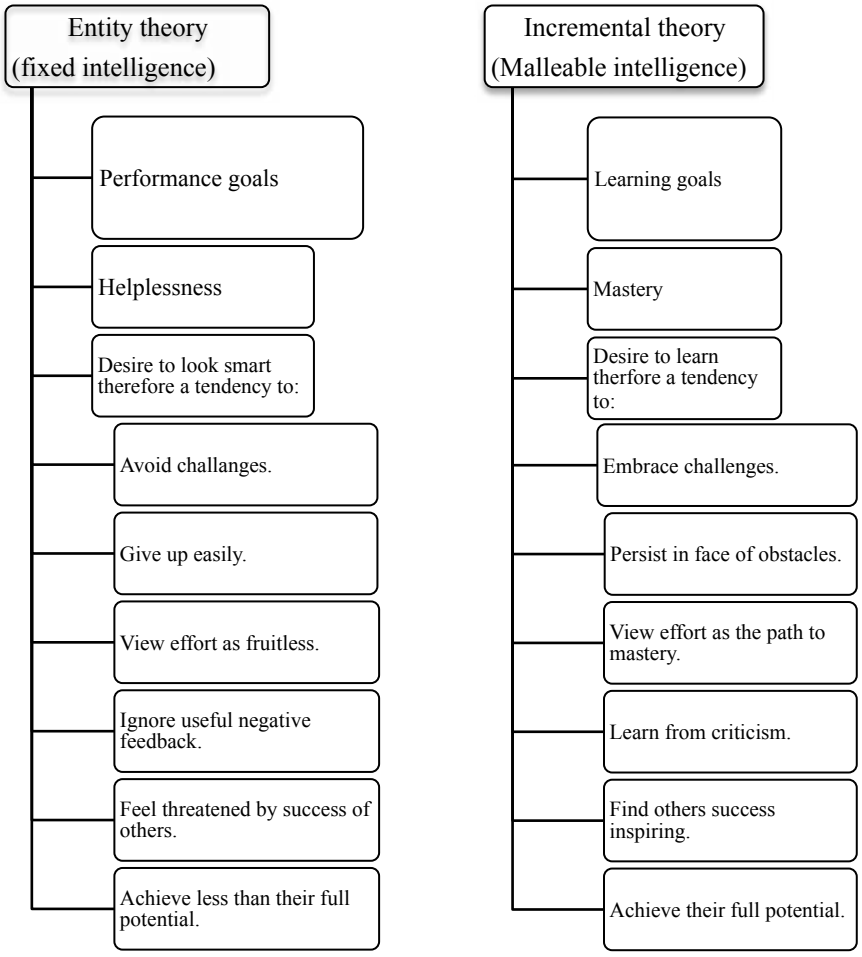

Figure 1: Behaviour and cognition patterns in response to failure

Regardless of confidence in their own intellectual abilities, those individuals from an incremental theory population exhibit a mastery-orientated response pattern (Table1). This is usually associated with deep-processing learning strategies such as elaboration or organisation, persistence in the face of obstacles and embracing challenges (Bandura & Dweck, 1985; Greene & Miller, 1996; Dweck, 2000). Individuals from the incremental theory population also attribute their success or failure to the amount of effort expended on a task (Dweck & Leggett, 1988). In contrast, individuals from the entity theory population are more apt to display helpless-orientated patterns, attributing their

success and failure to maladaptive self-attributions, for example thinking they are stupid (Dweck & Leggett, 1988). This pattern encompasses shallow-processing strategies such as rote learning, avoiding challenges, giving up easily and viewing effort as fruitless (Bandura & Dweck 1985; Meece, Blumenfeld & Hoyle, 1988; Dweck, 2000). However, an increased likelihood of entity theorists displaying adaptive behavioural patterns occurs when they possess high levels of confidence in their own intellectual abilities (Table 1) (Dweck & Leggett, 1988).

Theory of intelligence	Goal orientation	Perceived competence	Behaviour pattern
Entity	Performance	High	Mastery-oriented
		Low	Helpless-oriented
Incremental	Learning	High or low	Mastery-oriented

Table 1: Implicit theories, goal orientations, perceived competence and behaviour patterns in achievement situations (Redrawn from Dweck & Leggett, 1988)

The robustness of Dweck's (1986) model of social-cognitive theory of motivation has been challenged. Meece et al. (1988) found that students' performance goals were related to both shallow and deep learning strategies. Harackiewicz, Barron, Carter, Letho, and Elliot (1997) reported that the academic performance of those adopting performance goals was higher compared to students adopting learning goals, as measured by final course grades. Harackiewicz et al.'s (1997) results were later confirmed in a study by Harackiewicz, Barron, Tauer, Carter and Elliot (2000). Consequently, Dweck's (1986) two-goal orientation framework has been extended to include a performance goal orientation with avoidance (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Meece et al. (1988) found that this goal was significantly associated with shallow processing strategies and minimum effort. However, these studies did not use a causal model procedure, which is the only way to capture the meditational effects of variables as postulated by Dweck (1986) (Dupeyrat & Mariné, 2005). In contrast Dupeyrat and Mariné, (2005) used a causal modelling procedure called path analysis, and found their results on the whole to be consistent with Dweck's (1986) model, while supporting a three-goal framework (Table 2). There is now little debate about the positive effects of learning goal or the negative effects of performance goal with avoidance, however, there is still a mixed pattern of results regarding performance goal with challenge. Performance goal with challenge has been found to have negative, null and positive effects on measure of interest and performance (for review, see Harackiewicz et al., 1997). This research

supports a three-goal framework rather than Dweck's (1986) original two-goal orientation framework.

Striving for competence improvement (learning goals) had a positive impact on learning activities and outcomes, while striving to demonstrate competence (performance goal with challenge) or to avoid effort (performance goal with avoidance) had a negative influence on learning and achievement.	Supports Dweck's (1986) model.
Learning goals had a positive influence on academic achievement through the mediation of effort expenditure.	Supports Dweck's (1986) model.
Neither an entity nor an incremental theory were significantly related to performance goals.	Does not support Dweck's (1986) model.
Entity theory was a negative predictor of learning goals.	Supports Dweck's (1986) model.
Did not support Dweck's idea that entity and incremental theories are two opposite ends of a continuous and uni- dimensional construct.	Does not support Dweck's (1986) model.

Table 2: Summary of conclusions from Dupeyrat & Mariné, (2005)

Dweck's (1986) model is also supported by neurobiological evidence. Entity theorists tend to be vulnerable to negative feedback resulting in them disengaging from tasks, whereas incremental theorists tend to rebound better from negative feedback and failures (Chiu, Hong & Dweck, 1997). Mangels, Butterfield, Lamb, Good and Dweck's (2006) social cognitive neuroscience model research found that unlike incremental theorists, entity theorists orientated differently in response to negative performance feedback as indicated by an enhanced anterior frontal P3 that was also positively correlated with concerns about proving their ability to others. Entity theorists also exhibited reduced error correction on subsequent retest compared to incremental theorists, potentially due to entity theorist demonstrating less sustained memory-related activity (left temporal negativity) to corrective information, suggesting reduced effortful conceptual encoding of this material. These results support Chiu et al.'s (1997) individual difference study, because they suggest that entity theorists are more concerned about others' perceptions of them and that they reduce effort expenditure in response to threat, which ultimately compromises their ability to correct errors and succeed. Consequently, supporting the view that in the face of challenge, incremental theorists adopt a mastery-orientated response pattern, whereas entity theorists adopt a helpless-orientated pattern.

Implicit theories of intelligence have also been shown to influence academic achievement. Aronson, Fried and Good (2002) and Good, Aronson and Inzlicht (2003) found that when compared to a control group, intervention training which encouraged an incremental approach to view intelligence resulted in improved academic scores. A limitation of this study is that it did not examine this relationship over the long-term, therefore you cannot say such interventions affect long-term achievement trajectories. Nevertheless, recent research by Blackwell et al. (2007), which is of particular relevance since the participants (12 – 14 years old) are close in age to my participants, found that 7th graders with an incremental theory predicted an upward trajectory in grades over two years compared to those with an entity theory which predicted a flat trajectory. Consequently it is clear that possessing an entity or incremental framework of intelligence impacts success or failure in academic achievement.

The considerable benefits of possessing an incremental view of intelligence have stimulated research to assess whether individuals' self-theories of intelligence can be altered. Despite some success (Good et al., 2003) 'The Changing Minds Project' (Rienzo, Rolfe & Wilkinson, 2015) found that the two additional months progress in English and Maths achieved after a workshop to change 286 students' self-theories were not statistically significant. The researchers cannot be sure that the improvements in performance did not occur by chance. The results could be explained by the fact that the control group schools were also implementing approaches to promote incremental attitudes, therefore, the workshop intervention was not sufficiently intensive or sustained to make a difference in academic achievement. Unlike the other studies, Paunesku et al. (2015) tested a large sample of 1,594 students in 13 geographically diverse high schools using an online intervention module that required less research involvement and control. Their intervention improved students' average academic performance by 6.4%, which was of greater significance for those students who were at risk of dropping out.

I conclude that regardless of actual ability, self-perceptions of intelligence and goal orientations do impact upon pupils' academic success, due to the way they affect how individuals process information, respond to failure, construct representations and make inferences of events (Chen & Pajares, 2010). Furthermore, the inconsistent results regarding the ability to change self-theories of intelligence does not mean these programmes made no difference, just that there might not always be a quick fix (Rienzo et al., 2015).

Research Methods

Design

A case study was conducted using a quantitative and qualitative mixed methods approach, incorporating questionnaires (whole sample) and interviews (sub-sample). The questionnaires allowed me to establish whether the participants fell into one of three categories: entity theorist-achievement goal orientation with avoidance, entity theorist-achievement goal orientation with challenge or incremental theorist-learning goal orientation. I then aimed to interview participants from each group.

Participants

Opportunity sampling selected 25 year 5 students (11 Female, 14 Male) from a school in a city in the Fenland region of the United Kingdom. Their ages ranged between 9-10 Years of age. Consent forms were sent out to parents of 90 pupils via the school's parent mail system to all three of the school's Year 5 classes.

Measures and method of analysis

Initially I was going to administer the questionnaires: Implicit Theories of Intelligence Scale (Wheeler, 2007) and Achievement Goal Inventory (Wheeler, 2007). However, I decided to use the Implicit Theories of Intelligence Scale for Children – Self Form (Dweck, 2000) and Task-Choice Goal Measure (Dweck, 2000), because these questionnaires are more age appropriate (10 years of age or older).

Implicit Theories of Intelligence Scale for Children – Self Form:

The implicit theories of intelligence scale (Dweck, 2000) for children measured participants' perceptions of intelligence. The scale consists of three items, for example, 'You have a certain amount of intelligence, and you really can't do much to change it'. Each item measures intelligence from an entity framework rather than an incremental theorist perspective, because the implicit theory is a construct with a simple unitary theme and repeatedly rephrasing the same idea may cause participant confusion and boredom (Dweck et al., 1995). Participants rate their degree of

agreement with each statement on a 6 point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). An average score is obtained ranging from 1-6. I have incorporated Dweck's (2000) implicit theories of intelligence scale as part of my own questionnaires (Appendix 1). In line with Dweck et al.'s (1995) study, participants with clear theories of intelligence were considered for the sub-group. Participants with a score 3.0 or below were classified as entity theorists, while scores 4.0 or above were classified as incremental theorists. Any participant with a score between 3.0 and 4.0 was excluded from a sub-group, consequently 25% of the participants were excluded (Appendix 2). Whilst a small number of items in a scale may mean it has low-internal reliability, because psychometrically the internal reliability of a measure is positively related to the number of items in the measure (Dweck et al., 1995), this scale is considered a valid and reliable measure. Dweck et al. (1995) reviewed and found the internal reliability α ranged from 0.94 to 0.98, they also found it to be a valid scale (for full detail see Dweck et al., 1995).

Task-Choice Goal Measure:

The Task-Choice Goal Measure (Dweck, 2000) assesses pupils' academic goal orientation. Pupils choose to complete one problem out of a possible four. For example, 'I would like to work on problems that aren't too hard, so I don't get many wrong'. Participants were informed that there was no right answer; different students make different choices. Choices 1 and 3 indicate a performance goal orientation with avoidance. Choice 4 represents a performance goal orientation with challenge. While choice 2 is a learning goal orientation. Dweck (2000) and Dweck and Leggett (1988) found this to be a reliable and valid measure. Following completion of the measure, participants completed their chosen task. See Appendix 3 for the four problems.

Semi-structured interviews:

I decided to conduct semi-structured interviews, because they allow the order of the questioning to be flexible and permit me to appropriately respond to participants, whilst also producing rich comparable data across sources (Langdridge & Hagger-Johnson, 2009). Individual interviews were conducted, because I felt that the subject matter was quite personal, therefore, some children might be unwilling to share their thoughts in the presence of their peers (Langdridge & Hagger-Johnson, 2009). Vignettes based on research discussed in my literature review were used as stimuli for discussion, for example 'Sally has just failed at her maths test.'. I chose vignettes, because Barter

and Renold (2001) state that interviewing people in this more removed way compared to direct questions can make them feel more comfortable and more likely to open up. The vignettes were followed by open questions, for example 'What do you think?', thus allowing for rich data to be produced rather than single word answers (Langdridge & Hagger-Johnson, 2009). To triangulate my interviewed participants' questionnaire results from the Implicit Theories of Intelligence Scale for Children – Self Form, I asked pupils if they believed their intelligence could be changed; providing me with a deeper analysis of the implicit theories of intelligence construct (Langdridge & Hagger-Johnson, 2009). The interview schedule can be found in Appendix 4. Interview data were analysed using thematic analysis, whereby codes and themes were drawn from the data (Langdridge & Hagger-Johnson, 2009). (See Appendix 5 for an example of an interview transcript and Appendix 6 for examples of codes and themes). Quantitative data were also generated by noting on the interview scripts when strategies to overcome failure were mentioned.

Procedure

The questionnaire was initially piloted on a Year 5 pupil. No issues were raised. One participant was ill and another withdrew so did not complete the questionnaires. Consequently, 23 participants completed the questionnaires over two afternoons in either a hallway or an empty classroom. Following the Task-Choice Goal Measure the participants completed their chosen task (Appendix 3). Questionnaires were scored (Appendix 2) in accordance with the scoring criteria and participants were placed into one of three categories: (a) entity theorist - achievement goal orientation with avoidance, (b) entity theorist -achievement goal orientation with challenge or (c) incremental theorist -learning goal orientation. A sub-sample of 8 participants was then chosen. One participant acted as a pilot for the interview, which was not transcribed. A further participant withdrew during the interview while another was ill, therefore only 5 participants were interviewed one-on-one in a small room. Interviews were then transcribed and analysed.

Ethics

To ensure that my study was ethical, I followed and completed the Ethical Checklist provided by Cambridge University and had my proposal form approved by my personal tutor and class mentor. I also read the current guidelines on research in education from the British Education Research Association (BERA, 2011), which highlights, the importance of voluntary informed consent, right

to withdraw, ensuring no physical or mental harm and upholding privacy. To further ensure there were no ethical concerns with my project I reviewed my final questionnaire and interview schedule with both my mentor and the head teacher at the school.

Since the participants were children, parental consent was required (BERA, 2011). My mentor and school co-ordinator approved the consent form before sending it to the Year 5 pupils' parents via the school's parent mail. The form summarised the aims of my research project, why I was conducting the research and what the research project would involve if their child took part. It also assured the parents that any data collected would remain anonymous and confidential. Since children also have the right to freedom and self-determination, I also obtained the children's verbal consent before the questionnaires and interviews (BERA, 2011). Throughout the study participants were reminded that they had the right to withdraw at any time (BERA, 2011).

The school's name was blacked out on all documents to ensure confidentiality and anonymity. The participants' names were concealed on all documents to hide their identities, protect their anonymity and ensure confidentiality. Non-interviewed participants were given ID codes, whilst interviewed participants were given pseudonyms. Accordingly, only I am able to identify an individual's data. Furthermore, and in line with the Data Protection Act 1998 (Gov.uk, 2015), all data will be destroyed once the study has been completed.

I did not want the children to explicitly know that the questionnaires were measuring their implicit perception of intelligence (entity versus incremental) or their academic goal orientation, because it may have affected their answers. To combat this deception, I debriefed the participants after completion of the questionnaires, in which I informed them about the purpose of the questionnaires and checked that the children felt comfortable with their answers being used in the study, this is in line with Langdridge and Hagger-Johnson's (2009) approach.

Although taking part in the study would not physically or psychologically harm the participants, I chose not to ask the pupils directly about their own perceptions of success and failure, but used vignettes instead to ensure that their motivation to learn was not damaged in any way. I also did not inform the participants of their questionnaire results, so as not to damage their motivation to learn. I feel confident that my research is in line with the ethical standards set out by the BERA (2011) guidelines.

Discussion of questionnaire results

I was able to ascertain that the majority (62%) of participants' implicit theory of intelligence matched their academic goal orientation in accordance with the literature (Blackwell et al., 2007), compared with 38% whose goal orientation did not match their theory of intelligence (see Appendix 3 for a full list of participants' questionnaire results). However, due to the small sample size available for the study, I was unable to run a successful Chi-square test. The small sample meant that more than 20 percent of the expected frequency cells constructed as part of the Chi-square test had values below 5, therefore and in accordance with Langdridge and Hagger-Johnson (2009), the results of the Chi-square test would be unreliable. As a result, I cannot ascertain whether implicit theories of intelligence and achievement goal orientation have a relationship, which means I am unable to answer my first research question: What are pupils' implicit perceptions of intelligence and achievement goal orientation, and how are these related? Nevertheless, this does not rule out that the two constructs could have a relationship as indicated by the previous research of Blackwell et al. (2007). A larger sample size of approximately 50 participants would have enabled me to run a robust Chi-square test (Langdridge & Hagger-Johnson, 2009), such a sample size was impractical within the school where my study was based, because too few consent forms agreeing to participation were returned.

Triangulation of questionnaire results

Pupils who were scored as incremental theorists indicated that you could change your intelligence and this is what enables you to learn new knowledge. In contrast, the entity theorists' replies highlighted that they possessed the perspective that intelligence is something you are born with and that you cannot really change it. These findings support the pupils' results from the questionnaire: Implicit Theories of Intelligence Scale for Children – Self Form.

> *Josh (incremental) 'Of course it can change otherwise you would not get better and learn.'*
>
> *Lucy (entity) 'I agree you can't change the way you were born. It's like my brother is better on the bike than I was.'*

Discussion of interview results

The pupils who were scored as entity theorists-performance goal orientation with avoidance were ill or withdrew during the interview, therefore, I was only able to assess if these pupils' perspectives and causal explanations were different or similar compared to the other two groups: (a) incremental theorist-learning goal and (b) entity theorist-performance goal with challenge. Future research would be useful in assessing whether entity theory-performance goal with avoidance report different perspective and causal explanations regarding success and failure compared to the other two groups. The children that I interviewed were given the pseudonyms: Josh, Max, Lily, Lucy and Alice. The pupils who were scored as incremental theorist-learning goal orientation were Josh, Max and Lily, while Lucy and Alice were scored as entity theorists-performance goal orientation with challenge. Josh, Max and Lily will be referred to as incremental theorists, with Lucy and Alice as entity theorists during the discussion of results. There were four overarching themes that occurred in all of the interviews. These were: reactions to success; reactions to failure; effects on strategies; and effects on attribution. They will now be discussed in turn.

Reactions to success

To explore the children's response to success and failure as a result of feedback one of the questions I asked was: 'Jessica has just received her homework feedback. This feedback is both positive and negative. What do you think she will look at first?' All of the children responded well to receiving the positive feedback. They indicated that the positive feedback was useful, because it let them know what to do again next time to achieve the same mark or feedback, for example:

> *Max (incremental): '.. keep an eye on the positive to do it again.'*

> *Alice (entity): 'She will take that and read it and take it into mind and see that that's good and know that that stuff is good.'*

These reactions to success were consistent throughout all of the interviews. This suggests that implicit theories of intelligence and achievement goal orientation do not impact upon these children's perspectives regarding the way they would respond to success.

Reactions to Failure

As identified in the literature review, there are two distinct reactions to failure, which are termed helpless-orientated pattern and mastery-orientated pattern (Dweck, 2000). The incremental theorist-learning goal children: Josh, Max and Lily responded more positively to failure on the whole compared to Lucy and Alice who processes an entity view of intelligence with performance goal with challenge. Below are two examples of response to failure:

> *Alice (entity): 'I don't want to embarrass myself in class. If everyone got an answer right and I got it wrong and it was quite easy. I would realise that I got it wrong and I might feel stupid.'*
>
> *Lily (incremental): 'Yer, I think that's really good because I think that's true. You learn what to change from mistakes.'*

Alice's response suggested that she possesses the maladaptive self-attribute of being stupid at the prospect of mistakes. Considering she was scored as entity theory-performance goal with challenge this response is consistent with Chen and Pajares (2010) research findings of entity theorists having maladaptive self-attributes in response to failure. Lily, who was scored as an incremental theory-learning goal, viewed making mistakes as a positive. Her response indicated that she believed that you could reflect upon the mistakes you make and then apply these reflections to help with future tasks. The other two incremental children agreed with this response, supporting previous results regarding incremental theorists' view of mistakes reported by Dweck (2000). Based on this, I would suggest that the entity theorist children, Alice and Lucy, displayed on the whole a helpless-orientated patterned response to failure compared to Max, Lily and Josh, who in line with their incremental view of intelligence, displayed a mastery-oriented patterned response, conforming with the research findings of Blackwell et al. (2007) and Dweck and Leggett (1988)

Effects on Strategies

The incremental theorists Josh, Max and Lily's responses are in line with the belief that they could develop their competence though effort and that mistakes can be used to help you learn (Dweck, 2000). Those students with an incremental theory said (more so than the entity theorists) that after failure they would engage in adaptive strategies to overcome failure, like practising and learning from mistakes or negative feedback.

Josh: 'He could go home and practise like I do and then the next test I will improve.'

Lily: ...it's nice knowing the positive, but the negative is more helpful because it helps you work on what you need to.

These children with an incremental view of intelligence responded with a mastery-orientated perspective in response to failure, as expected, which is consistent with the research by Bandura and Dweck, (1985) and Chen and Pajares (2010). In contrast and in line with their helpless-orientation response pattern (Chen & Pajares, 2010), the responses from the entity theorist children Alice and Lucy, suggest that they would be likely to give up or disengage after failure, highlighting their concern over demonstrating their competence to others.

Lucy: '.....She might give up. Feel really gutted.'

Alice: 'Oh dear I'm not that good at maths never mind' and 'Well it would be nice that people know that you're smart, because you might not be smart at maths or literacy, but you might be good at sport. I would want other children to know that.'

What was interesting is that the entity theorists also indicated that they would respond to failure in an adaptive manner. They recognised that by listening in lessons or asking the teacher for help they could overcome failure. These perspectives suggest that although entity theorists are more likely to display maladaptive strategies in response to failure compared to incremental theorists, they are also capable of displaying adaptive strategies.

It must be noted, however, that the pupils' results could be in part affected by social desirability; they could be telling me what they think I want to hear (Langdridge & Hagger-Johnson, 2009). Lucy and Max informed me that the school had an 'assembly the week before' and had a 'class discussion the other day' on growth and fixed mindsets, which are other terms for incremental theory and entity theory. Consequently, the pupils' responses may have been influenced by this prior knowledge, for example Max indicated that you '…learn from mistakes, because your brain grows'. It is unlikely he would know this without experiencing the prior discussions. Another explanation for Alice and Lucy's results could be that they have a high level of confidence in their own intellectual abilities. While I did not measure pupils' confidence levels, Chen and Pajares (2010) found entity theorists with high confidence have been shown to display adaptive strategies.

To gain a clearer picture of which strategies the children were indicating in their interviews in response to failure, I coded the participants' strategies and recorded the average frequency they were mentioned. (See Appendix 7 for a table and visual representation of the average frequency that strategies were mentioned). Figure 2 shows that the entity theorists were the only group to display the maladaptive strategies of giving up, stop listening and caring. These findings are in accordance with previous research that indicates entity theorists are more likely to display maladaptive strategies than incremental theorists in response to failure (Dweck, 2000). However, Figure 2 also indicates that both groups agreed with adaptive strategies with similar frequency. My research findings may be explained by the fact that Alice and Lucy possess performance goals with challenge, rather than avoidance. This fits Meece et al.'s (1988) conclusions that individuals who possess performance goal with challenge exhibited both shallow and deep learning strategies, whereas those who possessed performance goal with avoidance are significantly associated with only shallow processing strategies. Future research should compare the two groups: performance goal with challenge and performance goal with avoidance's strategies as result of failure. Nevertheless, the incremental theorists were more likely to display adaptive strategies that incurred personal effort, for example, practising and working harder, which fits with their belief that the amount of effort expended is a cause of success or failure (Bandura & Dweck, 1985; Dupeyrat & Mariné, 2005). I cannot say that these differences observed in this study are significant, because my population sample is too small to run appropriate statistical tests (Langdridge & Hagger-Johnson, 2009).

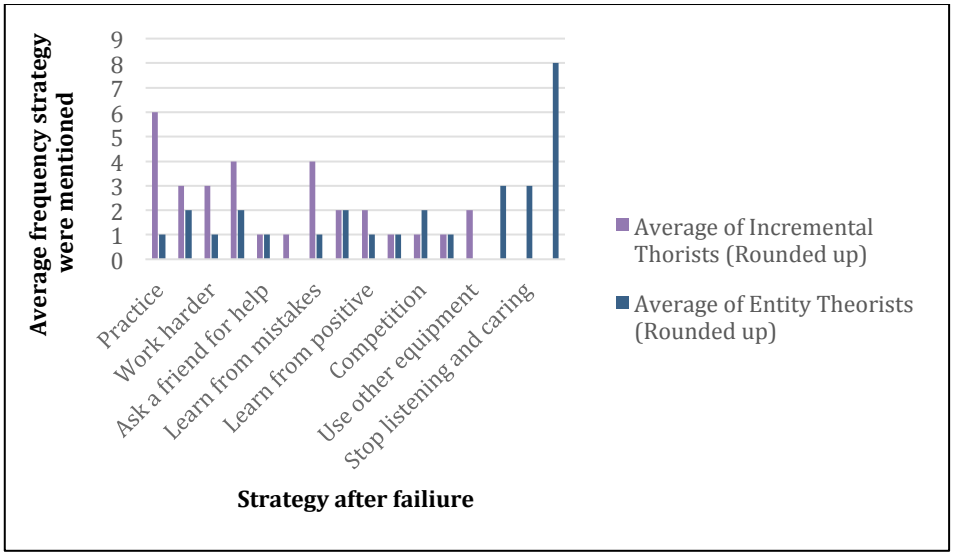

Figure 2: Average frequencies with which strategies in response to failure were mentioned

Effects on Attributions of Success and Failure

The children with an incremental theory of intelligence attributed effort, as a causal explanation for success and failure. Too little effort resulted in failure, while sufficient effort resulted in success. These findings are consistent with Bandura and Dweck (1975) and Dupeyrat and Mariné, (2005).

Josh (incremental): 'She didn't try very hard.'

Max (incremental): 'because he had probably been trying at home to practise the mistakes he made rather than spending all his time on games.'

The causal explanations for success and failure were not as clear-cut for the entity theorist students. They too, highlighted effort as a causal explanation for success and failure. Nevertheless, they also attributed possessing ability to success and lack of ability to failure.

Lucy: 'Well she could have not practised….'

Alice: 'Because he understands what he is doing and he knows what the answers should be and stuff, he is smart.'

Again, these contrasting results are consistent with Alice and Lucy possessing performance goal with challenge. This fits with Meece et al's (1988) findings that performance goals with avoidance is associated with minimum effort expenditure; while individuals with performance goals with challenge expend more effort than those with avoidance, as such they are capable of attributing effort to success and failure.

Summary of results

Due to my small sample size, I could not assess the relationship between implicit perceptions of intelligence and achievement goal orientation with sufficient statistical significance, as a result I was not able to answer my first research question. I could, however, answer my second research question: What are pupils' perspectives of success and failure and do they differ depending on implicit perception of intelligence and achievement goal orientation? Perceptual reactions to success appear not to differ depending on the participants' implicit theories of intelligence or their academic goal orientation. However, regarding the participants' perceptual causal explanations of success and failure, both groups perceived effort as a causal explanation. Yet it was only entity theorists who also attributed maladaptive self-attributes regarding their ability to failure and

success. Furthermore, the groups' responses and strategies to overcome failure also contrasted. Incremental theorists indicated perspectives associated with a mastery-orientation pattern of behaviours and cognitions, whilst entity theorists displayed a more maladaptive-orientated pattern. However, entity theorists did indicate some mastery-orientated adaptive strategies and thoughts in relation to failure. In conclusion, my results support Meece et al's (1998) research findings that individuals with performance goals with challenge display both adaptive and maladaptive reactions to failure. Consequently, it is likely that my research would have supported the three-goal orientation framework of Harackiewicz et al. (2000) had I been able to interview the participants exhibiting performance goal with avoidance. I can also conclude that incremental theorists are more likely to display a stronger mastery-orientated pattern in response to failure compared to entity theorists, agreeing with Dweck's (1986) model.

Analysis and Critical Reflection of Research Methodology and Results

As the results show, the use of semi-structured one-on-one interviews as a method of data collection was successful in highlighting pupils' perspectives and causal explanations of success and failure. Furthermore, the vignettes acted as good stimuli to draw out pupils' perspectives (Barter & Renold, 2001). As such, the pupils felt comfortable to disclose some personal information, for example Lucy discussed how she wanted to achieve just like her brother.

Although I used valid measures for assessing pupils' implicit theories of intelligence and academic goal orientations, my research would have been more reliable if I had established the reliability and validity of the measures in my own sample. However, due to the small sample size it is likely that such an analysis would have proven invalid (Langdridge & Haffer-Johnson, 2009). Nevertheless, the triangulation of the implicit theories questionnaire results with interview data was successful. It demonstrated that the questionnaire results yielded similar perspectives on intelligence as interviews, thus strengthening the internal validity of these findings (Langdridge & Haffer-Johnson, 2009).

If there had been no time restraints, it would have been beneficial to interview the pupil who was ill with an entity view and performance goal with avoidance. This would have allowed me to see whether pupils with performance goal with avoidance and performance goal with challenge had different perspectives and causal explanations on success and failure.

To add another level of analysis to my research, I could have measured pupils' confidence in their schoolwork. Confidence has been found to influence whether entity theorists display maladaptive strategies when confronted with failure or challenge, or display adaptive behavioural strategies (Dweck & Leggett, 1988; Chen & Pajares, 2010). This could have explained Lucy's and Alice's perspectives and causal explanations on success and failure.

Unlike other studies, including Bandura and Dweck (1985) and Dweck and Leggett (1988), I did not get the participants to complete the Task Goal Measure at a separate time to the Implicit Theories of Intelligence Scale for Children – Self Form. This was due to time constraints and agreements with teachers as to when I could take their pupils out of class. This may have affected the results of the questionnaires and could explain why 38% of the participants were classed as entity theory – learning goal orientation. However, these results might also have been influenced by social desirability. The pupils knew me as a teacher, therefore, they may have been influenced by my presence to pick the task that demonstrated they wanted to learn. It is possible that an alternative questionnaire, Questionnaire Goal Choice Items (Dweck, 2000) designed for age 12 and older, would have been less leading. However, I chose the Task-Choice Goal Measure (Dweck, 2000), because it was more age appropriate (age 10 and older) for my sample.

Since my research is a case study involving few participants, I am aware that my results may not conform with those from larger studies. Furthermore, my study was conducted in a single school and although my findings are fairly consistent with Dweck's (1986) model, there may be specific factors associated with the school that influence pupils' perspectives on success and failure regardless of their incremental or entity views of intelligence. Future research should be conducted across schools to assess whether school effects are important. Consequently, my results cannot be generalised.

Implications for Professional Development

It was clear from the results that not everyone fits neatly into a category. This is because the entity theorist children displayed both helpless and mastery orientated perspectives of failure and causal explanations of failure and success. I believe that this illustrates that I should not assume a child possesses a particular perspective about their intelligence or achievement goal orientation based on

observed behaviours and cognitions alone. If I should ever wish to know what my pupils' theories of intelligence or achievement goal orientations are, I should assess them through questionnaires.

Despite this, my research findings indicated that I should be aware of my future classes' perspectives regarding failure and causal explanations of failure and success. This is because incremental theorist children were found to exhibit stronger adaptive perspectives regarding failure and causal explanations of failure and success. Therefore, I should promote an incremental view of intelligence and learning goal orientation in my classroom, although a whole school approach would be more favourable.

There are various ways I can promote an incremental theorist view of intelligence and learning goal orientation in my classroom. According to Dweck (2015), I should teach my pupils how the brain works and the different theories of intelligence. Dweck's (2015) interactive computer program called "Brainology" outlines lesson plans and possesses six interactive modules to teach students about the brain. Although such interventions have produced mixed results (Rienzo et al., 2015), this particular intervention has been shown to change seventh graders views of learning and taught them how to develop adaptive strategies for learning (Dweck, 2015). The language I use when praising should also focus on achievement and effort, to encourage an incremental mantra, for example, 'well done! You're learning to …' or '…you mean you don't know yet' (Dweck, 2015). There is also a case that I should focus on promoting meta-cognition strategies as well. Whilst Growth mindset gives children the appropriate attitude and self-belief, meta-cognition gives them the tools to be able to talk about and understand their learning (Clarke, 2014). Hattie's (2009) meta-analysis of 63 studies deduced an effect size of 0.69, making addressing meta-cognition extremely worthwhile. To do this I could follow the recommendations from the educationist, Clarke (2014) who proposes that there are eight learning powers. I could use one of the most successful strategies to teach these learning powers to my future classes. A 'character' is attached to each of the eight categories and a story is written about the character exploring all the elements of that learning power. One story is usually focused on a week which Clarke (2014) terms a split screen approach.

I will also continue to take note of different ways of promoting a malleable perspective of intelligence in school. For example, in a staff meeting in placement 1b we were taught about their new maths strategy called Growth Approach to Problems. The strategy was designed to encourage children to develop incremental theorist attitudes within maths including to be comfortable with

uncertainty, to be creative, to try things out, to be happy to make mistakes, to be resilient and to be persistent. Conventional teaching was inverted in this new approach, instead to identifying an objective and teaching a concept or method first, the children were given a mathematical problem before any formal teaching had taken place. The children then tried to solve the problem and identified what they did and did not know. Following teaching on the topic that related to the problem the children would again try to tackle the problem and then communicate their solutions to try to convince a friend and opponent. I will try this strategy in my placement II and in my future career.

In conclusion, I will continue to progress my professional development within this area by keeping up to date with recent research and methods of developing pupil motivation in the sight of failure. With this in mind, I have begun reading Learning Without Limits (Hart, 2004) and Creating Learning Without Limits (Swann, Peacock & Drummond, 2012).

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Appendix 1

Questionnaire

Name:

Age:

Gender:

Implicit Theories of Intelligence Scale for Children – Self Form: (Dweck, 2000).

1. You have a certain amount of intelligence, and you really can't do much to change it.

1 Strongly Agree	2 Agree	3 Mostly Agree	4 Mostly Disagree	5 Disagree	6 Strongly Disagree

2. Your intelligence is something about you that you can't change very much.

1 Strongly Agree	2 Agree	3 Mostly Agree	4 Mostly Disagree	5 Disagree	6 Strongly Disagree

3. You can learn new things, but you can't really change your basic intelligence.

1 Strongly Agree	2 Agree	3 Mostly Agree	4 Mostly Disagree	5 Disagree	6 Strongly Disagree

Task-Choice Goal Measure: (Dweck, 2000).

I have different kinds of problems here for you choose from. There is no right answer – different students make different choices. Just put a tick in front of your choice.

I would like to work on:

……. Problems that aren't too hard, so I don't get many wrong.

……..Problems that I'll learn a lot from, even if I won't look so smart.

……..Problems that are pretty easy, so I'll do well.

……..Problems that I'm pretty good at, so I can show that I'm smart.

Appendix 2

Participants' Questionnaire Scores

Key – Goal orientation	
1	Performance goal – avoidance
2	Learning goal
3	Performance goal – avoidance
4	Performance goal – challenge

Participant	Entity	Incremental	Goal orientation	Expected or unexpected goal orientation depending on implicit theory of intelligence.	Interviewed
1	2.3		2	Unexpected	
2	2.3		2	Unexpected	
3		4	2	Unexpected	
Max		5.3	2	Expected	Interviewed
5	Withdrew				
6	2.7		4	Expected	
7	3.6		2	Unexpected	
8	Not in school on day of questionnaires.				
9	2.3		4	Expected	
Ellie	1.3		1	Expected	Ill on day of interview
11	3.7		2	Unexpected	
12	3.3		2	Unexpected	
13	Withdrew				
14	2.3		2	Unexpected	
Alice	2.3		4	Expected	Interviewed
Josh		6	2	Expected	Interviewed
17		5.3	2	Expected	
Lucy	2.3		4	Expected	Interviewed
19	3.3		2	Unexpected	
20		2	3	Expected	
Jack	3.3		1	Expected	Withdrew after interview
Lily		5.7	2	Expected	Interviewed
23	3.7		4	Expected	
24		4	2	Expected	
25	3		2	Unexpected	
				62% - In line with research. 38% - Not in line with research.	

Appendix 3

Tasks following task-choice goal measure

Year 6 level questions – choice 2 (Learning goal orientation)

Susie, Jones and Tom earned £354 washing cars over the weekend. They need to split the money equally. How much do they each get?	The journey to Josh's school is 7km. How far does Josh travel in total when he walks to and from school from Monday to Friday?
Melons cost 72p. There is a buy one get one half price deal on. How many melons can you buy with £8?	Alex borrowed £430 from his mum. He has paid back 50%. How much does Alex still owe?

Year 5 level questions – choice 4 (Performance goal orientation with challenge)

Gran gives Callum £25 for his birthday. His mum gives him half the amount that Gran gave him. How much does he get altogether?	Class 5 goes to the cinema. Adult tickets cost £1.20. Children's tickets cost 50p. What is the total cost for 20 children and 5 adults?
A box of chocolate bars contains 6 bars and costs £1.80. How much is the cost of 1 chocolate bar?	In a traffic survey, Class B counted 6 red cars and 16 white cars. There were half as many blue cars as white. There were three times more black cars than blue. How many black cars went past?

Year 4 level questions – choices 1 and 3 (Performance goal orientation)

Farmer Jack has 48 sheep. Half of his sheep have twins, a quarter have one lamb and two sheep have triplets. Two thirds of the lambs are male. How many female lams are there?	For every male cow on the farm there are 7 female cows. If there are 301 female cows, how many male cows are there?
I think of a number, add 5.1 and multiply it by 3.5. The answer is 35. What was my number?	A shop makes £32,350 this year. That is £2,456 better than last year. What did the shop make last year?

Appendix 4

Interview schedule

Vignettes I designed based on past research.

Sally has just failed at her maths test how do you think she feels?

- Why do you think she failed?
- Do you think she will fail at her next maths test? Why do you think that?
- What can she do to prevent her from failing the next maths test?
- Jessica has just received the feedback for her homework from her teacher: this feedback is both positive and negative. How do you think she feels about the feedback?
- Do you think she will learn from her mistakes?
- Do you think her next piece of homework will be better and why?
- What do you think she will do after receiving this negative feedback?
- Josh is working by himself on his topic work; he is finding it difficult. What do you think he will do?
- Max has just received 10/10 on his spelling test, why do you think he achieved this mark?
- What do you think he will do to achieve a similar mark next time?
- Sarah is finding her science lessons challenging, what do you think she will do?
- Luke got less than his friend on his SPAG test, how do you think he felt? What do you think he will do for the next SPAG test?
- Harry has just received his feedback from his homework from his teacher; this feedback is very positive. How do you think he feeds about this? What do you think he will do for his next homework?
- Sally thinks that an important reason why she does her schoolwork is because she wants to get better at it. What do you think?
- George thinks it would feel really good if he was the only one who could answer the teachers' questions. What do you think about this?
- Hanna thinks that she wants to better than other children in her class. What do you think about that?
- Nick thinks it's important to him that the other children in my class think he is successful at his work. What do you think about that?
- 'Sam likes schoolwork that he'll learn form even if he makes a lot of mistakes. What do you think of this?'

Triangulation question:

- Your intelligence is something you have a certain amount of and you can't really change it. What do you think about this?

Appendix 5

Example of an interview transcript

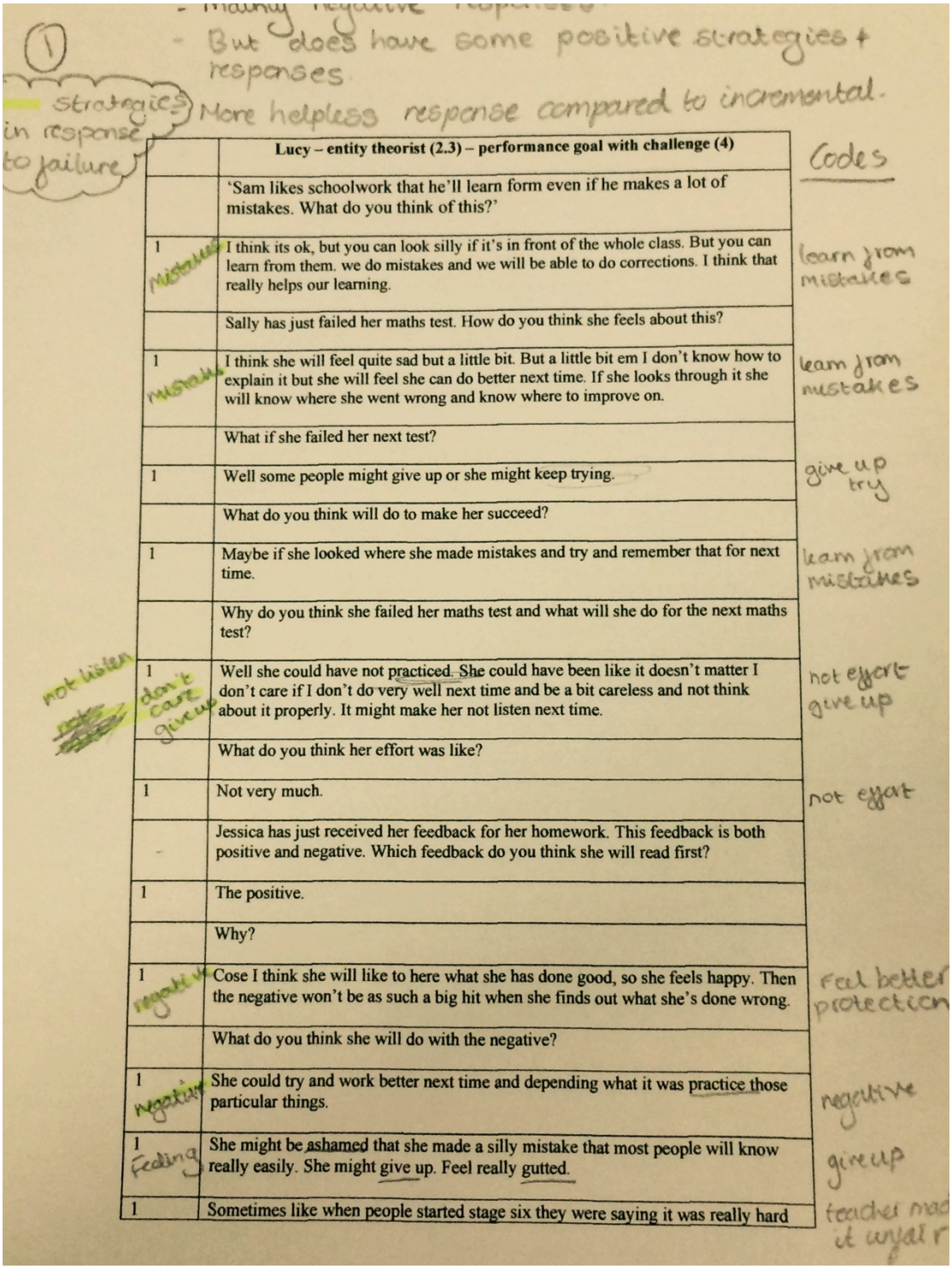
	Lucy – entity theorist (2.3) – performance goal with challenge (4)
	'Sam likes schoolwork that he'll learn form even if he makes a lot of mistakes. What do you think of this?'
1	I think it's ok, but you can look silly if it's in front of the whole class. But you can learn from them. we do mistakes and we will be able to do corrections. I think that really helps our learning.
	Sally has just failed her maths test. How do you think she feels about this?
1	I think she will feel quite sad but a little bit. But a little bit em I don't know how to explain it but she will feel she can do better next time. If she looks through it she will know where she went wrong and know where to improve on.
	What if she failed her next test?
1	Well some people might give up or she might keep trying.
	What do you think will do to make her succeed?
1	Maybe if she looked where she made mistakes and try and remember that for next time.
	Why do you think she failed her maths test and what will she do for the next maths test?
1	Well she could have not practised. She could have been like it doesn't matter I don't care if I don't do very well next time and be a bit careless and not think about it properly. It might make her not listen next time.
	What do you think her effort was like?
1	Not very much.
	Jessica has just received her feedback for her homework. This feedback is both positive and negative. Which feedback do you think she will read first?
1	The positive.
	Why?
1	Cos I think she will like to hear what she has done good, so she feels happy. Then the negative won't be as such a big hit when she finds out what she's done wrong.
	What do you think she will do with the negative?
1	She could try and work better next time and depending what it was, practise those particular things.
1	She might be ashamed that she made a silly mistake that most people will know really easily. She might give up. Feel really gutted.
1	Sometimes like when people started stage six they were saying it was really hard in maths. We were saying it was unfair.
	Josh is working by himself on his topic work and he is finding it a little difficult. What do you think his reaction will be to this?
1	Well he could feel sad because he doesn't have anyone to do it with or pressured and that he is not doing very well.
	So, what will his behavioural reaction be?
1	He might feel a little down he could not try as hard and just be sad.
	Max has just received 10 out of 10 on is spelling test. Why do you think he achieved that mark?
1	Maybe because he practised and he looked at it or sometimes it's just if you are really good at

	the particular words or that you are smart.
	Luke has got less than his friend on his SPAG test. How do you think he felt about that?
1	Well if it was his friend he might feel a bit sad. Probably be happy for his friend but feel that he could have done better and a bit jealous.
	What do you think his thoughts are in his head?
1	I would have done better, I could have beaten my friend then I would be the one smiling and cheering.
	So, what do you think he will do?
1	Well two options well if he is really down and gets angry quite easily he could stop being friends with that person and feel really down and upset. Or if he is one that takes it well and say well done mate and say but you are going to be in for a harder challenge next week because I'm going to beat you.
	Harry has just received his homework feedback and this feedback is very positive. What do you think he will do with his next piece of homework?
1	Sometimes people get like they don't really care about the next ones. But some people will say I will do better next time even if it is really high. Or they will work hard to get the same mark.
	Fiona has just been criticised for something she did during a lesson. How do you think she will take that?
1	She might take it badly and get all angry, she might feel embarrassed. She might give up.
	Whose fault will she think it is?
1	If she is someone who doesn't take it well she will think it is the teacher's fault. Or she could think it is my fault.
	Mary has gone away and done her work after her teacher explained what to do. Why do you think that will be?
1	Well she could not have listened or it could be that someone was distracting her or she could have been trying but this piece of work was really hard and she couldn't cope with it.
	What will she do about it?
1	It depends of what she was doing if she was not listening she could listen harder but is someone was distracting her she could ask them to stop. If she is not very good she could ask for ask for extra help.
	What if it is a persistent challenge, what would happen then to Mary?
1	She would probably feel she might feel that she could give up or try an easier piece of work.
1	It's like I was practising bike riding and if fell into a big ditch and I thought I would give up on bike riding but I started again because others were doing it and my brother could do it. I got a lot better by having a little rest.
1	I was scared so I didn't know whether I should do it again.
	Why did you want to do it again?
1	Well it was really my brother, he has always been better at physical sports and he just gave me inspiration and he could ride and I just really wanted to prove to him that I could do it.
	Hanna thinks that she wants to better than other children in her class. What do you think about that?
1	I think it could be something that you could do but it depends what people you want to better than. If you want to be better than the people that are really quite good then it might be too hard. But if you want to be better than the people who are a little bit better than you then the people just about you then you could do that.
	Why would you not want to try and beet the people high above you?
1	If you did it would be putting too much pressure on you. You will want to give up. Then you won't do as well.
1	I want to impress my brother. He is in the top group for everything and I want to be as good as him.

	Nick thinks it's important to him that the other children in my class think he is successful at his work. What do you think about that?
1	It might be slightly important. I mean it would be nice. But as long as you know it's ok.
	Your intelligence is something you have a certain amount of and you can't really change it. What do you think about this?
1	I agree you can't change the way you were born. It's like my brother is better on the bike than I was. Some people are better than others there is always someone smarter than you.
	What do you know about mindsets?
1	We did it in assembly a week ago and the teacher was telling us about, none of us are born smart, but it depends what sort of mind set you have. There is the mindset where you keep getting things wrong and a growth mindset where their mind keeps growing.

Appendix 6

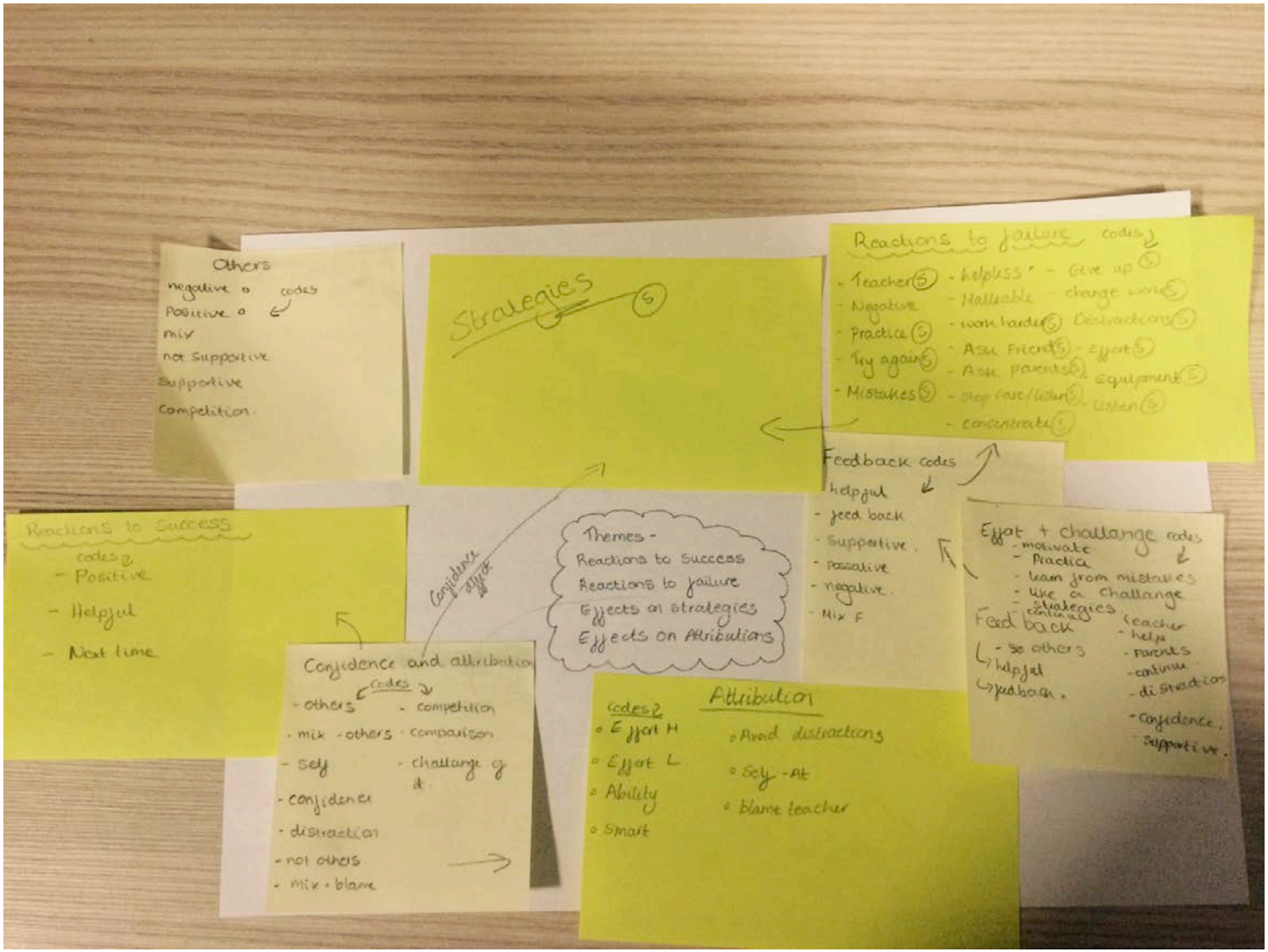
An example of a coded transcript and a mind map creating themes out of the codes



- But does have some positive strategies + responses.
- More helpless response compared to incremental.

strategies in response to failure

	Lucy – entity theorist (2.3) – performance goal with challenge (4)	Codes
	'Sam likes schoolwork that he'll learn form even if he makes a lot of mistakes. What do you think of this?'	
1	I think its ok, but you can look silly if it's in front of the whole class. But you can learn from them. we do mistakes and we will be able to do corrections. I think that really helps our learning.	learn from mistakes
	Sally has just failed her maths test. How do you think she feels about this?	
1	I think she will feel quite sad but a little bit. But a little bit em I don't know how to explain it but she will feel she can do better next time. If she looks through it she will know where she went wrong and know where to improve on.	learn from mistakes
	What if she failed her next test?	
1	Well some people might give up or she might keep trying.	give up try
	What do you think will do to make her succeed?	
1	Maybe if she looked where she made mistakes and try and remember that for next time.	learn from mistakes
	Why do you think she failed her maths test and what will she do for the next maths test?	
1	Well she could have not practiced. She could have been like it doesn't matter I don't care if I don't do very well next time and be a bit careless and not think about it properly. It might make her not listen next time.	not effort give up
	What do you think her effort was like?	
1	Not very much.	not effort
	Jessica has just received her feedback for her homework. This feedback is both positive and negative. Which feedback do you think she will read first?	
1	The positive.	
	Why?	
1	Cose I think she will like to here what she has done good, so she feels happy. Then the negative won't be as such a big hit when she finds out what she's done wrong.	Feel better protection
	What do you think she will do with the negative?	
1	She could try and work better next time and depending what it was practice those particular things.	negative
1	She might be ashamed that she made a silly mistake that most people will know really easily. She might give up. Feel really gutted.	give up
1	Sometimes like when people started stage six they were saying it was really hard	



Appendix 7

Average frequency with which strategies were mentioned

Adaptive Strategies	Frequency								
	Incremental theorists					Entity theorists			
	Max	*Lily*	*Josh*	**Total**	**Average of Incremental Thorists (Rounded up)**	*Lucy*	*Alice*	**Total**	**Average of Entity Theorists (Rounded up)**
Practice	6	0	10	16	6	0	2	2	1
Try again	7	1	1	9	3	2	2	4	2
Work harder	1	6	2	9	3	1	0	1	1
Ask teacher for help	4	1	5	10	4	1	3	4	2
Ask a friend for help	1	1	1	3	1	0	1	1	1
Ask parents for help	0	2	0	2	1	0	0	0	0
Learn from mistakes	6	2	3	11	4	2	0	2	1
Learn from negative feedback	2	2	0	4	2	2	1	3	2
Learn from positive feedback	2	2	0	4	2	0	1	1	1
Change work	1	0	0	1	1	1	0	1	1
Competition	1	1	0	2	1	3	1	4	2
Avoid distractions	0	0	0	2	1	1	0	1	1
Use other equipment	0	0	4	4	2	0	0	0	0
Listen and concentrate more	0	0	0	0	0	1	5	6	3
Maladaptive strategies									
Stop listening and caring	0	0	0	0	0	3	3	6	3
Give up	0	0	0	0	0	8	8	16	8

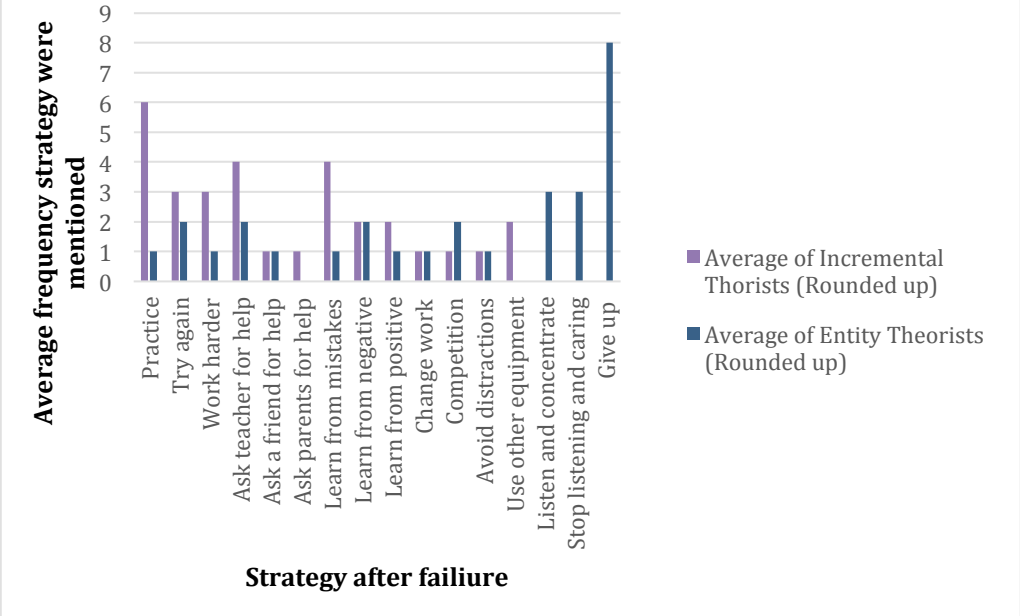


Figure: Average frequency with which strategies were mentioned