

Journal of Trainee Teacher Education Research

Pupils' perspectives on challenge: a study exploring pupils' mindset, their attitude to challenge, and self-differentiation in the year one classroom

Laura Jessop

(PGCE General Primary 2017-2018)

email: laura.amy.jessop@gmail.com

Abstract

This case study used a quantitative and qualitative mixed methods approach to investigate the relationship between year one pupils' perspectives of intelligence and their willingness to seek challenge. Four pupils with contrasting mindsets were interviewed and asked to complete drawings on their perceptions of 'challenge'. Within this particular setting, pupils were given the opportunity to select one of three differentiated tasks in English and mathematics. The pupils' choices were recorded over a period of four weeks and tested for statistical significance using an ANOVA test. Although this research found that growth mindset and fixed mindset pupils perceive challenge differently, this study was unable to establish a relationship between their mindset and their choice of differentiated task.

Pupils' perspectives on challenge: a study exploring pupils' mindset, their attitudes to challenge, and self-differentiation in the year one classroom

Laura Jessop

Introduction

One of the aims of primary education is to prepare pupils for the “opportunities, responsibilities and experiences of later life” (Department for Education, 2013, p5). In order to prepare pupils for an ever-changing world and ensure their success, pupils need to be encouraged to embrace challenge, build resilience, and develop a desire to learn (Muncaster & Clarke, 2016). As a result, there has been growing interest among policymakers to promote character and resilience education in schools (Education Endowment Foundation, 2015). In line with recent research, this paper aims to investigate the relationship between year one pupils' perceptions of intelligence and their attitudes to challenge.

In social and developmental psychology, researchers identified two opposing beliefs regarding intelligence (Dweck, 2017). While some people view intelligence as a fixed trait, others believe intelligence is a malleable trait that is capable of growth (Dweck, 2017). These implicit theories of intelligence can be respectively regarded as *entity theory* and *incremental theory* (Muncaster & Clarke, 2016). This paper uses these terms interchangeably with *fixed mindset* and *growth mindset*. Dweck and Legget (1988) argue that a pupil's mindset influences their learning behaviour. More specifically, a growth mindset acts as an underlying psychological mechanism that enables pupils to handle challenge (Blackwell, Trzesniewski, & Dweck, 2007).

To investigate the relationship between mindset and challenge, I interviewed year one pupils on their perspectives of intelligence and their attitudes to challenge. Within this particular setting, pupils regulated their level of work through self-assessment. In English and mathematics lessons pupils were given a choice of three differentiated tasks to complete; these tasks were named ‘genius’, ‘super genius’ and ‘mega genius’. By providing pupils with a choice, they were able to self-differentiate their learning so that it was appropriately challenging (Anderson, 2016). As I

found this differentiation strategy particularly interesting, I aimed to investigate whether a relationship exists between pupils' mindsets and their choice of task.

My research aims to answer the following questions:

1. Is there a difference in how year one pupils with contrasting mindsets perceive challenge?
2. Does a relationship exist between the mindset of year one pupils and their choice of differentiated task?
3. Is there a difference in the way in which pupils differentiate their mathematics learning compared to their English learning?

In this paper, I firstly outline the existing literature and research on intelligence, the theories of intelligence, and the effects of mindset on learning behaviour. I then discuss my research design and ethical considerations, before presenting and analysing my research findings. Finally, I evaluate my research and explore the implications that it has on my future practice.

Literature Review

Intelligence

Before exploring the different theories of intelligence, it is important to consider how intelligence can be understood. As intelligence has been studied across a variety of disciplines, there are a multitude of theories that attempt to explain it (Niesser et al., 1996, Lanz, 2000). Despite being researched for over a century, there is still little consensus on how intelligence can be defined and understood (Davidson & Kemp, 2011). This paper will outline two major theories regarding intelligence: Spearman's theory of *general intelligence* (1904) and Gardner's theory of *multiple intelligences* (1983).

Within psychology, Spearman's two-factor theory of intelligence remains a prevalent conception (Davis, Christodoulou, Seider, & Gardner, 2011). This theory suggests that intelligence is made up of two factors: a *g* factor which refers to general mental abilities and an *s* factor which refers to

specific mental abilities, such as mechanical and verbal skills (Plotnik & Kouyoumdjian, 2011). Spearman proposed that g factor represents our broad mental capacity that influences all cognitive abilities (Jensen, 1998); this g factor can be objectively defined and measured using IQ tests (Plotnik & Kouyoumdjian, 2011). Spearman's theory of intelligence has therefore formed the basis for more than 70 IQ tests that are still in circulation today (Davis et al., 2011). According to Spearman's theory, individuals who scored highly in some areas of intelligence tests, tended to score highly in all areas (Jensen, 1998).

Revising Spearman's theory of general intelligence, Gardner proposed a theory of multiple intelligences that suggests individuals possess at least nine autonomous intelligences (Davis et al., 2011). Gardner outlined these individual intelligences as: linguistic intelligence, logical-mathematical intelligence, spatial intelligence, musical intelligence, bodily-kinesthetic intelligence, naturalistic intelligence, interpersonal intelligence, and intrapersonal intelligence. Gardner arrived at the theory of multiple intelligences by studying people who had suffered brain damage and assessing which abilities remained (Plotnik & Kouyoumdjian, 2011). He also investigated how individuals in different environments develop abilities to adapt and succeed (Plotnik & Kouyoumdjian, 2011). According to Gardner's theory, individuals draw upon different intelligences individually; for example, an individual with high linguistic intelligence may not necessarily have high spatial intelligence and vice versa. Through analysis of multiple intelligences, Gardner also argued that intelligence tests only tend to examine linguistic intelligence and logical-mathematical intelligence (Davis et al., 2011). Supporting this view, other critics claim IQ tests focus on analytical intelligence and ignore other forms of intelligence (Nisbett et al. 2012). As I consider Spearman's theory to be too narrow a definition of intelligence, I align myself with Gardner's view of intelligence.

A key debate about intelligence has focussed on its origins; proponents of the *general intelligence* view consider intelligence to be an innate trait that cannot be changed whereas other contemporary scholars assert that intelligence can be influenced by environmental factors (Davis et al., 2011). Recent research has highlighted the interplay of biological and social factors that contribute to intelligence (Neisser et al, 1996). For example, high achievers are likely to end up in cognitively demanding environments that provide them with the opportunity to develop their knowledge and skills (Kan, Wicherts, Dolan & Van der Maas, 2013). According to Shonkoff and Philips (2000),

the interplay between biology and social factors is a continuous process that affects the way in which we understand intelligence.

Recent advances in neuroscience have also provided researchers with a deeper understanding of how the brain works (Boaler & Dweck, 2016). One particular area of interest has focussed on the plasticity of the brain. Scientists once believed the brain was hard-wired and could not be changed, however recent research has demonstrated that the brain is malleable (Dweck, 2017). According to Dweck (2017), challenging your mind and developing new skills, can cause changes to occur in both the structure and function of the brain. Through learning and practice, neurons in the brain multiply, get stronger, and transmit impulses quicker (Dweck, 2017). This new understanding of the brain shows support to the idea that intelligence is an aspect of behaviour that draws upon capabilities such as drive, persistence, and goal awareness (Wechsler, 1975).

Perspectives of Intelligence

Investigating pupils' drive and motivation led researchers to identify two opposing theories of intelligence: an entity theory of intelligence and an incremental theory of intelligence (Dweck, 2017). According to Dweck and Leggett (1988), these implicit theories of intelligence can impact pupils' learning behaviours including their use of learning strategies, learning effort, and response to failure or setbacks.

Pupils with an entity theory of intelligence believe intelligence cannot be significantly changed and is a static trait that is fixed at birth (Dweck, 2017). This view of intelligence can lead pupils to worry over how much intelligence they have (Dweck, 2000). As a result, those who ascribe to this theory of intelligence often consider mistakes and failure to demonstrate a lack of ability (Muncaster & Clarke, 2016). Pupils with an entity theory of intelligence also view effort as pointless and consider it to highlight a lack of ability. Neurological research has indicated that pupils with this mindset become easily disengaged from tasks after making errors (Moser, Schroder, Heeter, Moran, & Lee, 2011). In addition to this, they are considered to be vulnerable to negative feedback and criticism and often struggle with handling setbacks (Muncaster & Clarke, 2016).

Contrasting with this, pupils with an incremental theory of intelligence consider intelligence to be a malleable trait that is capable of growth (Dweck, 2000). These pupils believe that although people

differ in their initial talents and aptitudes, everybody is capable of change and growth through effort, application, and experience (Dweck, 2017). According to Dweck (1999), they do not necessarily believe that they have limitless potential; instead, they understand that effort plays an important role in the learning process. They also respond well to feedback as they view it as a supportive element in the learning process (Muncaster & Clarke, 2016).

Pupils' implicit theories of intelligence are also reflected in their choice of goal. According to Dweck, Chiu and Hong (1995), pupils with an entity theory of intelligence avoid challenging learning opportunities and taking risks; they prefer to engage in tasks that highlight their strengths. Contrasting to this, pupils with an incremental theory of intelligence accept challenges that can lead to mastery (Dweck, 2017). By adopting mastery learning goals, incremental pupils focus on improving their ability and view success as stretching themselves (Dweck, 2017).

Dweck (2006) reports that approximately 40% of children and adults display a fixed mindset, 40% display a growth mindset and the remaining 20% display mixed profiles. However, Muncaster and Clarke (2016) argue that most people are placed somewhere along a continuum between a fixed and a growth mindset. In addition to this, Muncaster and Clarke (2016) argue that pupils may have different perspectives of their intelligence in different contexts. For example, a pupil may hold a fixed mindset view in regard to their mathematics skills, but believe that their verbal abilities are capable of development and growth.

The Success of Growth Mindset

Increasing evidence has highlighted that pupils who endorse a growth mindset are more likely to achieve than those who endorse a fixed mindset (Boaler & Dweck, 2016). Henderson and Dweck's (1990) study on junior high pupils found that growth mindset pupils achieved higher grades in their first year when compared to fixed mindset pupils. As this study focussed on a transition period between elementary school to junior high, Henderson and Dweck (1990) attributed their findings to the ways in which the pupils dealt with the challenge of new academic pressures.

Expanding on this research, Blackwell et al. (2007) conducted a longitudinal study focussing on junior high pupils in an inner-city school in New York. The students in this study varied in terms of ethnicity, achievement, and socioeconomic status, which increased the external validity of the research findings. An intervention was used with the students to test whether incremental theories

of intelligence can affect achievement. Their findings demonstrated that pupils' theories of intelligence became a significant predictor of their mathematical achievement. In addition to this, their findings also supported the idea that diverging achievement patterns emerge during challenging transitions. Furthermore, when compared to the control group, significantly more growth mindset pupils showed an increase in effort and motivation.

This research is further supported by an experimental study conducted by Aronson, Fried and Good (2001). In the experimental condition, a group of African-American college students were encouraged to adopt a growth mindset by viewing intelligence as a malleable trait as opposed to a fixed trait. The researchers found that students who had received the growth mindset intervention reported higher enjoyment of academic subjects, achieved higher grades, and engaged more with academic material when compared to the control group.

These findings have provoked interest among researchers in the UK. A research project known as *Changing Mindsets* was initiated in order to improve pupils' academic attainment by supporting the development of a growth mindset (Education Endowment Foundation, 2015). This project focussed on investigating whether growth mindset interventions could improve the academic attainment of year five pupils. From studying 286 pupils across six primary schools, the findings showed that the pupils who received the six-week long growth mindset intervention made an average of two additional months progress in both English and mathematics. However, it was impossible to draw a causal relationship between the growth mindset interventions and the pupils' academic progress, as the findings lacked statistical significance. The evaluation of their latest investigation involving 100 schools is due to be published in Autumn 2018.

Although the above evidence points towards the benefits of adopting a growth mindset, little research has investigated the mindsets of young pupils. In an interview for an online article, Dweck argued that traits of a fixed and growth mindset can be seen in pupils as young as three and a half years old (Gross-Loh, 2016). After introducing the concept to her year two class, Muncaster found that pupils aged six and seven years old had no difficulties in internalising the concept of a growth mindset (Muncaster & Clarke, 2016). In addition to this, she also found that most growth mindset pupils developed a desire for challenge.

Despite increasing evidence highlighting the benefits of a growth mindset, Dweck's theory has received criticism. For example, translating complex psychological ideas into classroom language

can prove difficult and may result in the distortion of the original research findings (Bloom, 2017). Responding to this criticism, Dweck argues that in order for her theory to be effective, educators need to learn how to properly embody growth mindset into their practice (Bloom, 2017). To promote further understanding, Dweck is currently developing materials to improve educators' practice of growth mindset within the classroom.

Research Design

In order to investigate mindset and challenge, my study used mixed methods research. Mixed methods research involves the use of more than one research method within a single investigation (Mason, 2006). An advantage of this is that it allows researchers to investigate the research questions from a variety of angles and perspectives (Mason, 2006). Researchers are able to examine the ways in which the findings complement or contradict each other in a process known as triangulation (Mason, 2006). My research draws upon qualitative data from the use of semi-structured interviews and pupils' drawings. Quantitative data has also been collected through monitoring and recording the pupils' choice of task over the course of one month. As my research design draws upon both qualitative and quantitative data, this allows for a greater depth and corroboration of findings (Mason, 2006).

Pupil Sample

The pupils in this study attended a mixed infant school in North Cambridgeshire; this is a large key stage one school that caters for pupils aged between 4 and 7. The pupils at this school are predominantly white British with occasional pupils of European professionals. The local area is popular with professional people who have been attracted to the region due to the university and associated STEM industries. The school is part of a Multi Academy Trust and was rated 'good' in its latest OFSTED report. At this school, pupils are generally of no particular faith. Although it holds a small percentage, Christianity is the largest faith. As I was on placement at this school at the time of research, the sample was primarily selected out of convenience.

Pupils from my placement class were interviewed to identify the extent to which they were able to meet the inclusion criteria. The inclusion criteria identified pupils who were able to discuss their views of intelligence and exhibit traits of either a growth or a fixed mindset. As this research is

contextually based, samples depended upon the richness of interviews and extent to which the pupils responded to my research purpose and questions (Bell, 1993). Although I used a small sample for my research, I ensured the pupils were balanced in terms of their gender and mindset. Minimising the effects of age, all four pupils had recently turned six years old. Pupils were also similar in terms of their attainment as all pupils were either working at the expected level or exceeding in both English and mathematics.

Interviews

For this investigation, I used semi-structured interviews to identify the pupils' perspectives on the malleability of intelligence. Scott (2000) argues that interviews are considered to be a valuable tool in understanding young children's perspective. Using semi-structured interviews allowed me to ask pupils to clarify their answers and infer further meaning through their non-verbal behaviour, such as their facial expressions and hesitations (Bell, 1993). As I was researching the perspectives of young pupils, I adopted a relaxed persona in order to create a conversational exchange between the pupils and myself (Gollop, 2000).

Table 1 shows the interview questions that were used to identify the pupils' theories of intelligence. These questions have been adapted from mindset questionnaires developed by Dweck (2006, 2017). Dweck's questionnaires were used as a resource as they have been previously used as a valid method to identify mindsets. These questionnaires provide researchers with ordinal data by asking participants to rate how far they agree with a series of growth and fixed mindset statements. However, Einarsdóttir (2007, p203) notes "questionnaires are not a common method to use with young children". To avoid any barriers to pupils' understanding, I opted to adapt the mindset statements into interview questions. This allowed me to clarify and probe pupils' responses for further meaning and construct a complete picture of the pupils in the study. In addition to being interviewed on their perceptions of intelligence, pupils were also interviewed on their perceptions of challenge and the self-differentiation method used in their class (Table 2).

1	Can you change how clever you are?
2	Do you think you can be cleverer?
3	Do you think everybody can be clever?

Table 1: Interview questions on the malleability of intelligence that were asked to the pupils.

1	What are challenges?
2	Do you like challenges?
3	In your classroom there are three different types of activity to choose from. There is ‘genius’, ‘super genius’ and ‘mega genius’. Can you tell me more about these?

Table 2: Interview questions on pupils’ perspectives of challenge and the self-differentiation method

When preparing the interview questions, I considered variables that could potentially influence the pupils’ responses. These variables included: clarity, leading questions, and pupils’ language level (Munn & Drever, 2004). Before interviewing the pupils, I informally asked the class if they knew the meaning of the word ‘intelligence’. After discussion with the class, I found that pupils were better able to respond to the word ‘clever’. When conducting research with young children, Einarsdóttir (2007) argues that research methods must suit their competence and knowledge. For this reason, I decided to interview children on their perspectives of ‘cleverness’.

The interviews were conducted after I had known the pupils for four weeks and established a rapport with them. A rapport between the researcher and participant is essential, particularly for detailed discussion of the phenomenon being studied (Bell, 2010). Establishing a rapport with the pupils also enabled them to feel comfortable being interviewed individually. Interviewing the pupils individually eliminated the risk of their responses being influenced by each other. With the pupils’ permission, all interviews were recorded and later transcribed for analysis. The pupils’ responses were coded using either ‘incremental’ or ‘entity’ to highlight the pupils’ implicit theories of intelligence.

Pupils’ Drawings

To enhance the validity of my research, the pupils were asked to produce drawings that encompassed their perceptions of challenge. According to Einarsdóttir, Dockett and Perry (2009), drawings provide pupils with an effective way of exploring and communicating their understanding and perceptions. Through this method, I was able to access the pupils’ views and interpretations of challenges in a context where they “had some control over the nature of their engagement” (Einarsdóttir et al., 2009, p220). When analysing pupils’ drawings, research has emphasised the importance of the discussion that develops around the drawing (Einarsdóttir et al., 2009). For this

reason, I sat with the pupils and asked them to describe and discuss their drawings with me. To avoid pupils' drawings and discussion being influenced by one another, I sat with the pupils individually during class time.

Quantitative Data

To investigate my second research question, I observed and recorded the pupils' choice of differentiated tasks over the course of one month. After collecting the data, I tabulated my findings and produced visual charts in order for it to be easily scrutinised. Collecting quantitative data enabled me to compare the pupils' interview responses and their choice of task. To test the significance of my findings, I performed a mixed-design Analysis of Variance (ANOVA) test using SPSS software. The ANOVA test compared the pupils' mindset with their choice of task by combining and comparing the choices of the growth mindset pupils with the choices of the fixed mindset pupils.

Ethics

This research adhered to the British Educational Research Association's (2011) ethical guidelines. These guidelines outline the researchers' responsibility to gain consent, respect participant's privacy, grant participants the right to withdraw, and take all the necessary steps to reduce potential stress or discomfort.

As informed consent is the most essential part of research ethics, I firstly sought written permission for my investigation (Cheng-Tek Tai, 2012). Consent from the Headteacher and the Head of Year One was granted before letters were sent home to parents and guardians. The letters informed them of the research, sought permission to produce audio recordings, and welcomed any questions that they might have had.

Before the study, I explained the purpose, method, voluntary nature, and the right to withdraw to the pupils. Pupils were also informed that their names and information would be kept confidential. By asking pupils to confirm if they felt comfortable being interviewed, I was able to gain informed consent. To protect the privacy of the pupils, pseudonyms have been used to refer to them throughout the research. The pupils are therefore referred to as: Maisy, Jack, Ellie and Eason. The interview recordings were not distributed to anybody else and were deleted after transcription.

Analysis of Interview Data

Perspectives of Intelligence

1. Can you change how clever you are?	Maisy:	Yes
	Ellie:	No.
	Jack:	Yes
	Eason:	I'm not sure. That might be hard to do that.
2. Do you think you can be cleverer?	Maisy:	Yes
	Ellie:	Not sure.
	Jack:	Yes. By doing more of my phonics and maths.
	Eason:	I think to be more clever, it can be pretty hard to do that. Sometimes you might need to start all over again.
3. Do you think everybody can be clever?	Maisy:	If they tried hard enough they could.
	Ellie:	No. Because everyone has different talents.
	Jack:	Yes. By working out things they're not good at.
	Eason:	Well a lot of people do get called clever clogs. But I don't think so no.

Table 3: Summary of pupils' responses to the mindset questions.

Table 3 shows the pupils' responses to questions regarding the malleability of intelligence. After analysing the data, I found that Maisy and Jack's responses highlighted traits of a growth mindset, as both pupils believe they are able to change and increase their cleverness. These beliefs are in line with the incremental theories of intelligence outlined in the literature review. In addition to this, Maisy and Jack referred to practice and effort as a way to increase cleverness. For example, Jack believes that he can increase his cleverness by practising maths and phonics. Similarly, Maisy believes that everybody can be clever "if they try hard enough". The pupils' reference to practice and effort is in line with the incremental view of intelligence, particularly as incremental theorists understand the importance of practice and effort in the learning process (Dweck, 1999).

Contrasting to Jack and Maisy, Ellie's responses suggested traits of a fixed mindset. Ellie believes she cannot change how clever she is and she is unsure as to whether she can become cleverer. In

addition to this, Ellie believes that not everyone can be clever because “everyone has different talents”. Her views reflect an entity theory of intelligence, as entity theorists believe intelligence is a static trait that not everybody can possess (Dweck, 2017).

Similarly, Eason’s responses also highlighted traits of a fixed mindset. Eason claimed to be unsure as to whether he can change how clever he is or whether everybody has the potential to be clever. In his responses to the first two questions, Eason also claimed that changing cleverness or becoming cleverer might be difficult. Believing that this might be difficult suggests traits of an entity theory of intelligence. As outlined in the literature review, entity theorists view intelligence as a hard-wired trait that is not subject to change. For this reason, I consider Eason’s views to lean closer towards an entity theory of intelligence as opposed to an incremental theory of intelligence. In addition to this, Eason does not believe that everybody can be clever, despite hearing a lot of people being called “clever clogs”. According to Dweck (2017), the ways in which pupils are praised link closely to the way in which they view intelligence. Dweck (2017) argues that praising children for their intelligence makes them more likely to develop a fixed mindset, whereas praising pupils for their effort can increase their motivation to learn (Dweck, 2017).

Through the thematic analysis of the interview data, I identified Maisy and Jack as exhibiting traits of a growth mindset. In contrast, I identified Ellie and Eason as displaying traits of a fixed mindset. After identifying pupils who met the inclusion criteria, I proceeded to analyse their perceptions of challenge.

Pupils’ Perspectives on Challenge

Previous research on pupils’ mindset and perceptions of challenge led me to predict that Maisy and Jack would show positive attitudes towards challenge whereas Ellie and Eason would express negative attitudes. Table 4 shows the pupils’ responses to the question “Do you like challenges?”.

Maisy:	Yes. Because I like learning new stuff and I like doing challenges because they're quite hard. And I like trying new things but and I want to try them a little quite hard.
Ellie:	No.
Jack:	Yes. Because they're hard and you can test your knowledge.
Eason:	Handwriting challenges, I'm really confident about them because I, I believe I can do it. If I can't do it then, I get a bit annoyed or upset.

Table 4: Pupils' responses to the question "do you like the challenges?"

Maisy and Jack responded positively to challenge; after encouraging them to expand on their answers, I found that they both liked the difficulty of challenges. Their responses are in line with my prediction and previous research in this area. Contrasting to this, Ellie expressed a dislike of challenge. Further questioning revealed that she was unsure what she disliked about them. Similarly, Eason expressed a dislike of tasks and activities that he feels he is unable to do. Instead, Eason prefers activities that he feels confident about such as "handwriting challenges". Eason's response supports previous research as Dweck (2017) found that pupils with an entity theory of intelligence prefer performance-orientated tasks that consolidate their intelligence. In addition to this, Eason described feeling "annoyed" or "upset" if he believed he could not complete a task. Previous research has shown that pupils with a fixed mindset can exhibit helpless behaviours such as becoming upset or annoyed when they are faced with a task they find challenging (Dweck 2017).

The pupils' drawings also show support to their interview responses. For example, Maisy drew a smiling child driving a car (Figure 1). When discussing her drawing, Maisy explained, "it's a challenge for me to drive a car". Jack drew a child confronting a mathematics challenge and labelled his child as happy (Figure 2). Maisy and Jack's drawings support their interview responses as they both drew children who are happy when confronted with a challenge. In contrast, Ellie drew a child who looked unhappy (Figure 3). When discussing her drawing, Ellie explained that the child felt "confused". Similarly, Eason drew a child confronting a mathematics problem who also looked unhappy (Figure 4). Further questioning revealed that the drawing showed a child who was correcting himself after being told his answer was wrong. Ellie and Eason's drawings support their interview responses as they both depict negative emotions and the negative implications of challenges. By asking the pupils to draw and discuss their perceptions of a 'challenge', I was able to establish consistency between their drawings and their interview responses.

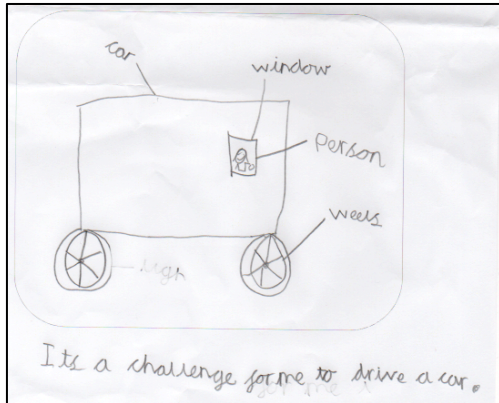


Figure 1: Maisy's drawing of a 'challenge'

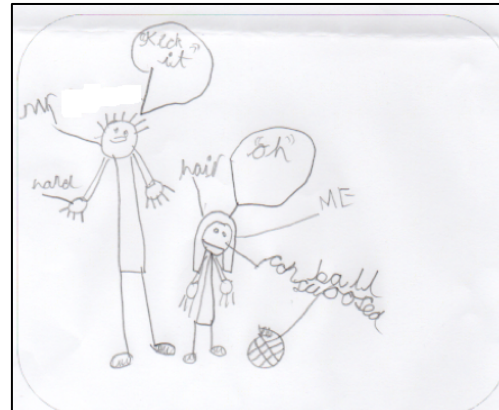


Figure 3: Ellie's drawing of a 'challenge'

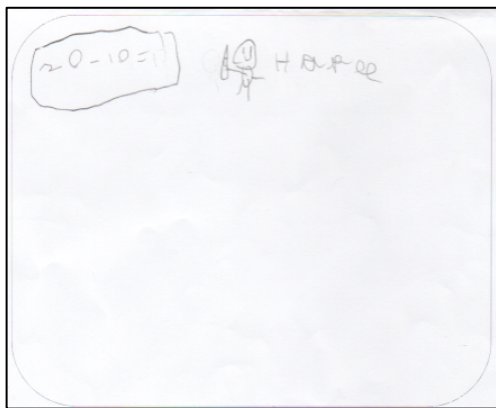


Figure 2: Jack's drawing of a 'challenge'



Figure 4: Eason's drawing of a 'challenge'

After analysing my findings in reference to my first research question, I conclude that pupils with contrasting mindsets perceive challenge differently. The pupils who exhibit traits of a growth mindset responded positively to challenges whereas the pupils who display traits of a fixed mindset responded negatively.

Perceptions on Self-Differentiation

Before investigating whether a relationship exists between pupils' mindsets and self-differentiation, it is important to explore how pupils perceive the differentiation method used in their class. This is important in qualitative research in which the role of the researcher is to gain an insight into the thoughts and feelings of their participants in order to understand what might affect their behaviour. To investigate this, I asked pupils to describe the differentiation method used in their class. Table 5 shows the pupils' descriptions of the 'Genius', 'Super Genius', and 'Mega Genius' levels. By

examining their responses, I was able to understand the meanings that the pupils attribute to each level.

All four pupils recognised the hierarchal structure of the levels, but the pupils’ attitudes differed towards the ‘genius’ level. Maisy and Jack described the ‘genius’ level as meaning ‘clever’. Jack added ‘that’s the easiest one’ and suggested the differentiation system compares pupils’ cleverness. Eason and Ellie both likened the ‘genius’ level to lacking in ability. Eason claimed “‘genius’ means you’re not very good but you’re still doing it” whereas Ellie claimed that the ‘genius’ level is chosen by “some people [who] can’t really do things easily”. Ellie also referred to choosing the ‘mega genius’ as being ‘brave’. Ellie and Eason’s responses show support to findings of recent report published by the National Education Union (2017). According to this report, attempts to disguise ability levels through euphemisms are unsuccessful. Examining the pupils’ attitudes enabled me to better understand their motivations for choosing particular tasks. For example, Eason and Ellie’s description of the ‘genius’ level suggested that they might be reluctant to choose this type of task.

Maisy	Genius’ means you’re quite clever. Super genius’ means you’re very clever. [Mega genius] means you’re really really clever
Ellie	some people um can’t really do things easily and they pick the ‘genius’ and some people do it sort of have trouble and they pick the ‘super genius’ and if people really feel brave they pick the ‘mega genius’
Jack	Genius means clever. That’s the easiest one. And it compares, if people are cleverer enough to do it. Because you have, sometimes you just do one of them and then another.
Eason	Well ‘genius’ means you’re not very good but you’re still doing it. ‘Super genius’ is the same but you put another skill on. Mega genius you can put two more skills on. It’s like super genius but you’re just adding on more.

Table 5: Pupils’ descriptions of the ‘genius’, ‘super genius’ and ‘mega genius’ level

Analysis of Quantitative Findings

Figure 5 compares the pupils’ choice of task over the period of one month. Over this time, the ‘genius’ level was the least chosen among the four pupils. Maisy selected mostly ‘mega genius’

tasks; her results show the largest range between the choices of tasks. Despite showing fixed mindset traits, Eason also selected mostly ‘mega genius’ tasks. Contrasting to this, Ellie selected mostly ‘super genius’ tasks. Ellie’s findings also show a large range between the choices of tasks. Although Jack showed traits of a growth mindset, he too selected mostly ‘super genius’ tasks.

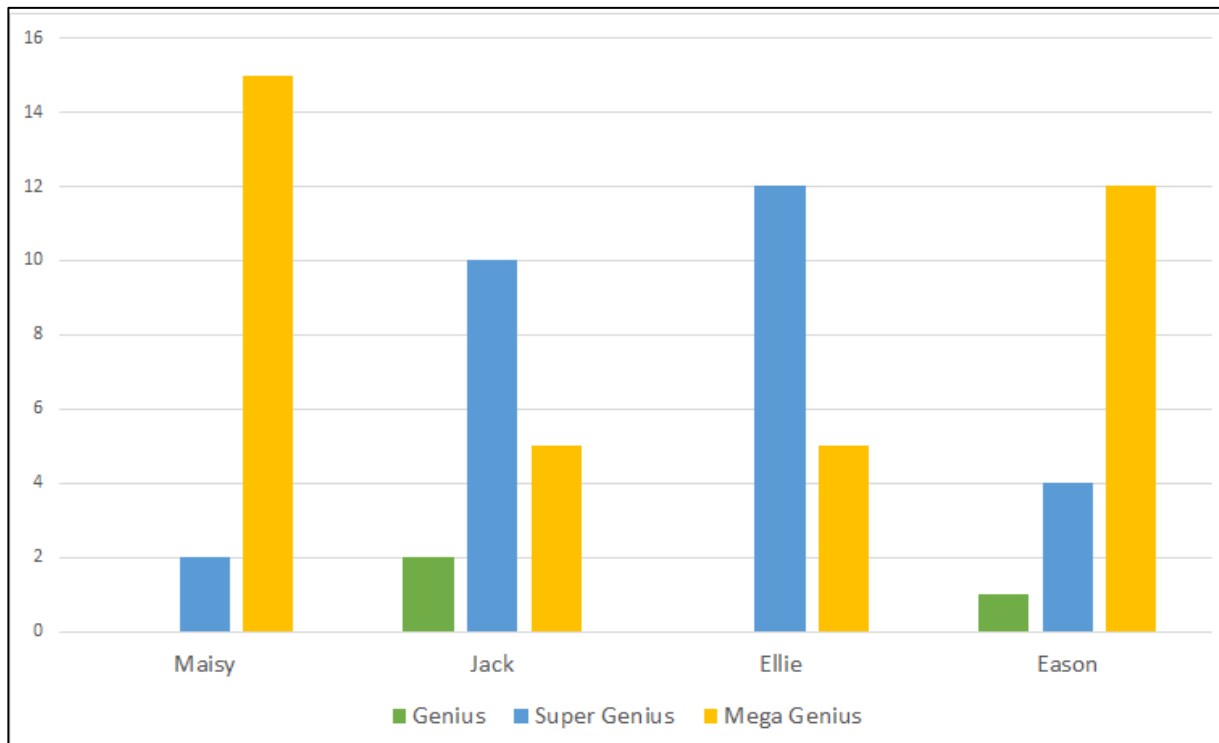


Figure 5: Bar chart displaying the pupils’ choice of task over a period of four weeks

From analysing the findings, I found that Maisy and Ellie’s choice of task are consistent with my prediction and previous research on mindset. In contrast, I found Eason and Jack’s choice of task to be inconsistent with both my prediction and previous research. After analysing the data using SPSS software, the ANOVA test produced these findings: ($F(1) = 0.04, p = .858$). These findings demonstrate no significant differences between Maisy and Jack’s choice of task and Ellie and Eason’s choice of task. In order for there to be a statistically significant difference between their choice of task, the significance level, represented by p , should be less than or equal to 0.05. My findings are therefore unable to demonstrate a significant relationship between pupils’ mindset and self-differentiation.

Analysis of Pupils’ English and Mathematics Differentiation

Through further analysis, I found that a significant relationship exists between the pupils’ selection of task and the different curriculum subjects. The following figures were produced by the ANOVA test and fall within the range of statistical significance: ($F(1) = 11.78, p = .026, \text{Cohen’s } d = 2.96$). Figure six compares the ways in which the pupils differentiated their mathematics and their English learning. From this bar chart, I identified that with the exception of Maisy, pupils selected the ‘super genius’ task more than the ‘mega genius’ task in English. Compared with English, the ‘mega genius’ task was also selected more.

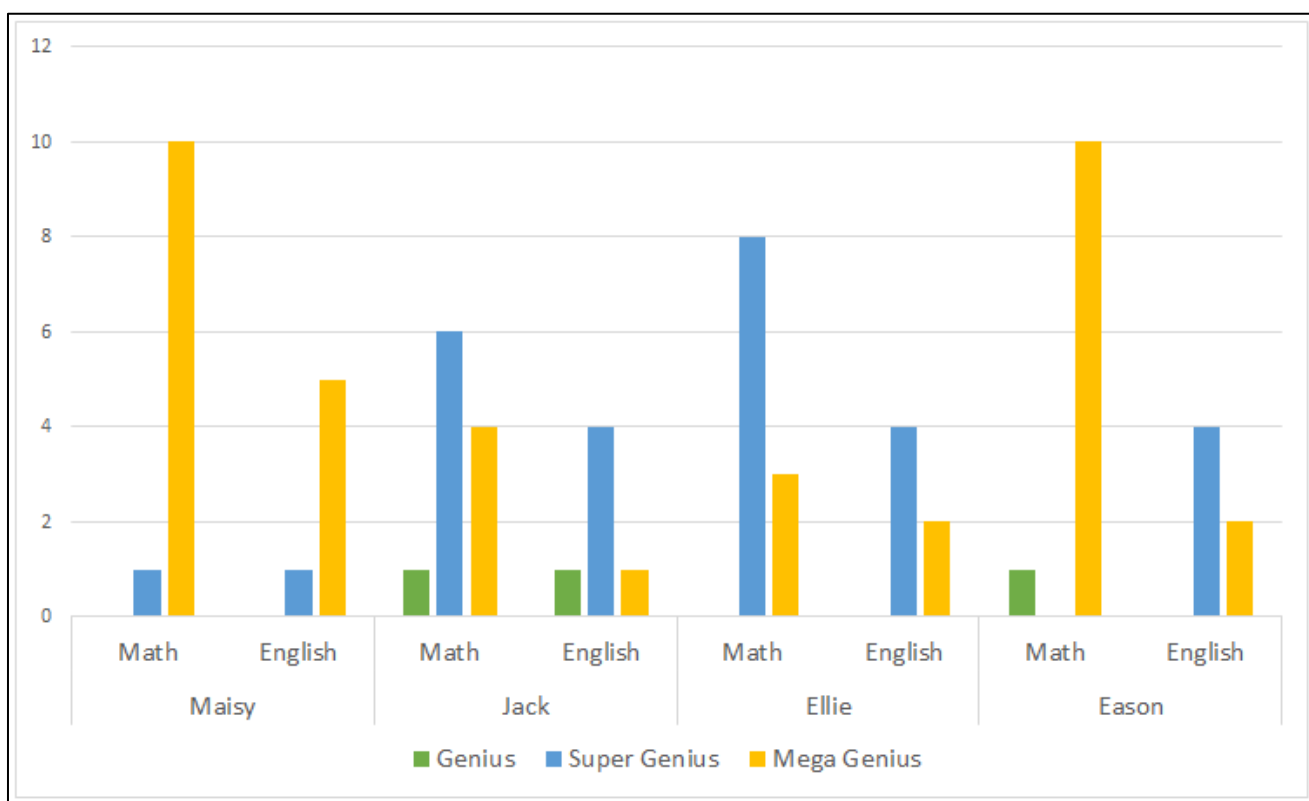


Figure 6: Bar chart displaying the difference between pupils’ choice of task in mathematics compared with English

Analysis and Critical Reflection of Research

When analysing my findings in reference to my research questions, I am able to conclude that year one pupils with contrasting mindsets perceive challenge differently. My research is also able to establish a difference in the way pupils differentiate their learning in mathematics and English.

After completing my research, I shared my insights with my class mentor in order for him to maximise the learning potential for all of the pupils within the class.

Due to the nature of this research, I was unable to establish a relationship between pupils' mindset and their choice of differentiated task. I therefore acknowledge that extraneous variables may have influenced my research findings. For example, the pupils' choice of task may have been influenced by variables such as: their curricular interests, the teaching input, the type of differentiation, and the choices of their classmates. Due to research limitations, these variables remain unexplored. However, further research into these areas could produce potentially interesting findings. In order to gain a more complete picture of mindset and self-differentiation, I would like to investigate whether pupils' choice of task can be influenced by the way in which a task is differentiated, for example, examining whether differentiating tasks by quantity, mastery, or thinking skills affect pupils' task selection.

It is also important to note that as a small sample size was drawn from one school, the findings are limited in how far they can be generalised to other pupils in different contexts. In order to draw a generalised conclusion from the results, this research would have to be repeated using a larger sample across a variety of locations.

Implications for Future Practice

This research has had several implications on my future teaching practice. Firstly, I aim to reinforce pupils' growth mindset throughout my teaching. As research has outlined the positive effects of a growth mindset, I intend to create a growth mindset culture within my classroom. Speaking recently to the Times Higher Education magazine, Dweck argues that a growth mindset should be embodied within all aspects of teaching practice (Hazell, 2017). I therefore aim to talk to pupils about how the brain can grow, how abilities can be developed through practice, and the benefits of learning from each other (Dweck, 2017). I also intend to be a good role model for my pupils by sharing my learning experiences with them and demonstrating the ways in which I overcome challenges. In addition to this, I aim to promote the value of learning and encourage pupils to view learning as a life-long journey that can be influenced through positive learning behaviours. As a teacher, I will strive to encourage my pupils to show resilience, set themselves high expectations, and embrace all opportunities to challenge themselves.

The second implication of my research is that I aim to use the self-differentiation method in my future practice. By implementing this strategy, teachers are able to increase their pupils' intrinsic motivation by encouraging them to connect with their strengths and interests (Anderson, 2016). This method also provides pupils with autonomy over their learning (Anderson, 2016). In order to ensure pupils differentiate their learning effectively, teachers need to create a safe and supportive classroom environment (Anderson, 2016). According to a recent report published by the National Education Union (2017), pupils as young as early years have an awareness of ability grouping. This awareness has the potential to damage pupils' self esteem and lower their expectations (ibid.). Teachers can therefore help pupils feel safe and supported by creating an "environment of opportunity, expectation and challenge" (Arthur & Cremin, 2014, p364). By implementing the self-differentiation method, the learning environment can also become more collaborative (Anderson, 2016). According to Anderson (2016), when pupils complete the same task, they are more likely to view themselves in competition with other pupils. However by providing pupils with choice, classwork can become more diverse and harder to compare (Anderson, 2016).

The final implication of my research is to take care with how I praise my pupils. This implication stems from Eason's reference to "clever clogs" within the semi-structured interview. According to Dweck (2016), praise is considered to be intricately connected to the ways in which pupils view intelligence. Praising pupils' intelligence by using phrases such as "clever clogs" can have negative consequences on pupils' perceptions and learning attitudes. Pupils who are praised for their intelligence often develop fixed mindsets. In contrast, pupils who are praised for their efforts or the process they used to be successful are more likely to be motivated and be successful in the future. I therefore aim to praise my pupils for their efforts, hard work, and the process they use in order to succeed.

References

- Aronson, J., Fried, C. B., & Good, C. (2001). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, 37(1), 1-13.
- Anderson, M. (2016). *Learning to Choose, Choosing to Learn: The Key to Student Motivation and Achievement*. Alexandria, VA: Association for Supervision & Curriculum Development.

- Arthur, J., & Cremin, T. (2014). *Learning to Teach in the Primary School* (3rd ed.). London: Routledge.
- Bell, J. (1993). *Doing Your Research Project* (2nd ed.). London: Open University Press.
- Bell, J. (2010). *Doing Your Research Project* (5th ed.). Maidenhead: Oxford University Press.
- Bloom, A. (2017). *Weekend read: is growth mindset the new learning styles?* Retrieved from <https://www.tes.com/news/weekend-read-growth-mindset-new-learning-styles>
- British Educational Research Association. (2011). *Ethical Guidelines for Educational Research*. Retrieved February 10, 2018, from <https://www.bera.ac.uk/wp-content/uploads/.../BERA-Ethical-Guidelines-2011.pdf>
- Boaler, J., & Dweck, C. (2016). *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching*. San Francisco, CA: Jossey Bass A Wiley Brand.
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: a longitudinal study and an intervention. *Child Development*, 78(1), 246-263.
- Cheng-Tek Tai, M. (2012). Deception and informed consent in social, behavioral, and educational research (SBER) *Tzu Chi Medical Journal*, 24(4), 218-222.
- Davidson, J. E., & Kemp, I. A. (2011). Contemporary Models of Intelligence. In R. J. Sternberg & S. B. Kaufman (Eds.), *Cambridge Handbook of Intelligence* (pp. 58-84). Cambridge: Cambridge University Press.
- Davis, K., Christodoulou, J., Seider, S., & Gardner, H. (2011). *The theory of multiple intelligences* in R. J. Sternberg & S.B. Kaufman (Eds.), *Cambridge Handbook of Intelligence* (pp.485-503). Cambridge: Cambridge University Press.
- Department for Education. (2013). *The National Curriculum in England: Key Stages 1 and 2 framework document*. Retrieved February 13, 2018, from <https://www.gov.uk/government/publications/national-curriculum-in-england-primary-curriculum>
- Dweck, C. S., Chiu, C., & Hong, Y. (1995). Implicit theories and their role in judgements and reactions: A world from two perspectives. *Psychological Inquiry*, 6, 267–285.

- Dweck, C. S. (1999). *Self Theories: Their Role in Motivation, Personality, and Development (Essays in Social Psychology)*. London: Routledge.
- Dweck, C. S. (2000). *Self Theories: Their Role in Motivation, Personality, and Development*. Philadelphia: Taylor and Francis.
- Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. New York, NY: Random House.
- Dweck, C. S. (2016). The Perils and Promise of Praise. In M. Scherer, (Ed.), *On Formative Assessment: Readings from Educational Leadership (EL Essentials)* Alexandria, VA: ASCD.
- Dweck, C. S. (2017). *Mindset: The New Psychology of Success*. New York, NY: Ballantine Books.
- Dweck, C., & Leggett, E. L. (1988). A Social-Cognitive Approach to Motivation and Personality. *Psychological Review*, 95(2), 256-273.
- Education Endowment Foundation. (2015). *Changing Mindsets: Evaluation report and Executive summary*. Evaluated by: Rienzo, C., Rolfe H., and Wilkinson D. Retrieved January 30, 2018, from www.educationendowmentfoundation.org.uk
- Einarsdóttir, J. (2007). Research with children: methodological and ethical challenges. *European Early Childhood Education Research Journal*, 15(2), 197-211.
- Einarsdóttir, J., Dockett, S., & Perry, B. (2009). Making meaning: children's perspectives expressed through drawings. *Early Child Development and Care*, 179(2), 217-232.
- Gardner, H. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. New York, NY: Basic Books.
- Gollop, M. M. (2000). Interviewing children: a research perspective. In A. B. Smith, N. J. Taylor & M. M. Gollop (Eds.), *Children's voices: research, policy and practice* (pp. 18-37). New Zealand: Pearson Education
- Gross-Loh, C. (2016). Don't let praise be the consolation prize. Retrieved February 15, 2018, from <https://www.theatlantic.com/education/archive/2016/12/how-praise-became-a-consolation-prize/510845/>
- Hazell, W. (2017). Carol Dweck: the three biggest misconceptions about growth mindset. *TES*. Retrieved February 10, 2018, from <https://www.tes.com/news/school-news/breaking-news/carol-dweck-three-biggest-misconceptions-about-growth-mindset>

- Henderson, V., & Dweck, C.S. (1990). Achievement and motivation in adolescence: A new model and data. In S. Feldman and G. Elliott (Eds.). *At the threshold: The developing adolescent*. Cambridge MA: Harvard University Press.
- Jensen, A.R. (1998). *The G Factor: The Science of Mental Ability*. London, CT: Praeger Publishers.
- Kan, K. J., Wicherts, J. M., Dolan, C.V., Van der Maas, H. L. J. (2013). On the Nature and Nurture of Intelligence and Specific Cognitive Abilities: The More Heritable, the More Culture Dependent. *Psychological Science*., 24(12), 2420-2428.
- Lanz, P. (2000). The Concept of Intelligence in Psychology and Philosophy. In H. Cruse, J. Dean, & H. Ritter (Eds.), *Prerational Intelligence: Adaptive Behavior and Intelligent Systems Without Symbols and Logic, Volume 1, Studies in Cognitive Systems*, 26 (pp. 19-30). Dordrecht: Springer
- Mason, J. (2006). 'Mixing Methods in a Qualitatively-Driven Way'. *Qualitative Research*, 6(1) 9-26.
- Muncaster, K., & Clarke, S. (2016). *Growth Mindset Lessons: Every Child a Learner*. London: Rising Stars.
- Munn, P., & Drever, E. (2004). *Using Questionnaires in Small-scale Research: A Beginner's Guide*. Glasgow: The SCRE Centre.
- Moser, J. S., Schroder, H. S., Heeter, C., Moran, T. P., Lee, Y. H. (2011). Mind your errors: evidence for a neural mechanism linking growth mind-set to adaptive posterror adjustments, 22(12), 1484-9.
- National Education Union. (2017). Grouping in Early Years and Key Stage One: A necessary evil? Final report by A. Bradbury & G. Roberts-Holmes, Retrieved February 16, 2018, from <https://neu.org.uk/sites/neu.org.uk/files/NEU279-Grouping-in-early-years-KS1.PDF>
- Nisbett, R. E., Aronson, J., Blair, C., Dickens, W., Flynn, J., Halpern, D. F., et al. (2012). Intelligence: New findings and theoretical developments. *American Psychologist*, 67(2), 130-159.
- Neisser, U., Boodoo, G., Bouchard Jr, T.J., Boykin, A., W Brody, N., Ceci, S.J., et al. (1996). Intelligence: Knowns and Unknowns. *American Psychologist*, 51(2), 77-101.

Plotnik, R., & Kouyoumdjian, H. (2011). *Introduction to Psychology* (9th ed.). Belmont, CA: Wadsworth Cengage Learning.

Scott, J. (2000). Children as respondents: The challenge for qualitative methods. In P. Christensen, & A. James (Eds.), *Research with children: Perspective and practice* (pp. 98-119). London: Falmer Press.

Shonkoff, J. P., & Philips, D. (2000). *From neurons to neighborhoods: the science of early childhood and development*. Washington D.C: National Academy Press.

Spearman, C. E. (1904). General intelligence, objectively determined and measured. *American Journal of Psychology*, 15, 201-293.

Wechsler, D. (1975). Intelligence defined and undefined: A relativistic appraisal. *American Psychologist*, 30, 135–139.