

# Does reward and competition in groups aid learning in a Primary setting

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**Does reward and  
competition in  
groups aid learning in  
a Primary setting?**

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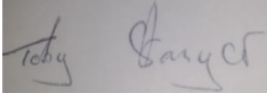
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### 1.1 Statement of originality

I confirm that I have fully acknowledged all sources of information and help received and that where such acknowledgement is not made the work is my own.

Signed: 

Tobias Stanyer

Dated 04/05/2020

### 1.2 Acknowledgements

This study is dedicated to those Primary school education teachers who have a consistent desire to improve their practice through caring and reflection. That as educators we can always make it better. My thanks go to the many people who have provided support over my time at University but especially to my tutor. I am indebted to the Primary school who allowed me to carry out the research and to the participants of the research.

## 1.3 Abstract

### 1.3.1 Hypothesis:

1. Group scores in a task will improve with the introduction of a reward whilst using a minimal type experiment reducing the amount of extraneous variables.
2. Group scores in a task will improve with the introduction of competition whilst using a minimal type experiment reducing the amount of extraneous variables.
3. Group work with the addition of competition will lead to vicarious reinforcement and so improve the outcomes for all pupils.

Discussion: Does the introduction of competition and reward in groups improve performance of the learning of primary school aged children.

There are three aspects of the study and that is to see whether reward aids learning behaviour and whether competitiveness aids learning behaviour. That is if a group of pupils are in a non-competitive environment, will they perform as well as one that is in a competitive environment.

There are two major definitions which are used and discussed in the introduction. These are Emerson's definition of group (nation) (1978 as cited in Reicher et al., 2001) and Sherif's definition of intergroup behaviour (Sherif, 1951). The experimental method used eight pupils from key stage 3 and 4.

To explore this, I have devised three experiments:

### 1.3.2 Experiment

#### 1.3.2.a Experiment 1

Have a class: Split class in 2.

- Group A do task and record behaviour and results from task. (without other group knowing)
- Group B do task and record behaviour and results from task (Group B will be told that they will receive a reward at the end of the exercise) (without other group knowing).

Use statistical analysis to see the effect of reward. (This is to control for the reward effect later on)

### 1.3.2.c Experiment 2

Have a class: Split class in two. Allow them to bond as a group and keep them in same room

(not the same groups as previously). State that the group who do the best will receive an award.

- Group A do task and record behaviour and results from task.
- Group B do task and record behaviour and results from task

Use statistical analysis to see the difference in task scores between experiment one and experiment two.

Results expectation.

That competition improves results.

### 1.3.2.c Experiment 3.

This is a qualitative experiment using a Behavioural check list as seen in Figure 2 (Behavioural Checklist)

### 1.3.3 Results.

Experiment 1: accepts the hypothesis that reward improves results.

Experiment 2: accepts the hypothesis that competition improves results.

Experiment 3: rejects the question that reward and competition in groups aids learning in a Primary setting.

## 1.4 Rational

If I take the basic definition of education then it comes as:

“the process of receiving or giving systematic instruction, especially at a school or university” or as “an enlightening experience.” (Lexico, 2020).

This obviously does not cover what education is and the different pedagogies that are encompassed in it. So, I would like to take a step back to the idea that,

“Educational Excellence Everywhere” (Department for Education, 2016)

That as educators it is our job to unlock the potential of each child that we come into contact with. This statement has a number of presumptions which are important to me as a teacher. The basic assumption is that young people can be educated and are as

such when they start a literal "Tabula rasa" as explained by the Philosopher John Locke (1632-1704) in which he believes as individuals are born without built in mental content and this is learnt throughout their life and that education is not about the gathering of facts but the cultivation of the intellect (Androne, 2014). This then leads to the next aspect of how this blank slate is filled and in the simplest form this is through learning theory (behaviourism) and the three basic components of this theory. That is classical conditioning as first shown by Pavlov (1902) and his salivating dogs, Operant conditioning through Skinner (1948) and his rats/pigeons and Social Learning Theory which is shown through the experiments of Bandura (Bobo doll experiments, 1961) (Crain, 2013). Each one of these philosophical ideologies relies on different aspects to learn and they are in order: association (classical conditioning), reinforcement/punishment (operant conditioning) and vicarious reinforcement (Social learning Theory). In operant conditioning there is the addition of or taking away of a reinforcer (Positive and Negative reinforcement) and the taking away or addition of punishment (Negative and Positive punishment) this in simple terms is a tool used constantly in education the idea of reward and punishment to aid in teaching and learning. In vicarious reinforcement, there are four aspects required as explain by Bandura (1961) in his mediational process model. These are: Attention (How much we are exposed to the behaviour), Retention (How well we remember the behaviour), Reproduction: (the ability to perform the behaviour) and Motivation (the desire to perform the behaviour) (Crain, 2013). Much of this basis of research has led to further educational pedagogies such as Vygotsky (1978) Scaffolding which uses Bandura's Mediational process as a basis (Bernstone, 2007). I find this fascinating as my own belief of learning is based upon a behavioural approach and the idea that children can learn, change and that they are not predestined by societal or biological factors. Therefore, the understanding of these basics of education is important and that what we then need to do is look at how we can implement them to allow each child to succeed to the best of their ability and to do this we must remember the basics of the theory all the way back to the philosopher John Locke (1632-1704). The basis of my research is based upon these ideas and then concentrates on how we, as teachers, can harness the power of motivation through both working in groups (Peer Scaffolding) and whether competition aids in the success of learning (Reinforcement and Punishment in terms of vicarious reinforcement e.g. feeling of loss when not winning or the feeling of joy at winning and the vicarious reinforcement aspect of seeing others winning and wanting to emulate that). This is partially due to my own experiences of

school in which I found that I progressed further and quicker when in a competitive team environment and clear competitive goals were set. There is also, as will be seen in the literature review a paucity of research into competition at primary level which is an area I will add to.



## 2 Literature review.

The aim of this section is to provide an overview of the literature that relates to the area that is being covered. The first part of the review will look at the theories of motivation in psychology and education, with reference to the development of these from psychology to teaching. Concentrating on the areas that are proposed by this research.

The second part of the review will look at the theories of group dynamics within psychology and teaching and how such aspect of Social Learning Theory (1961), Normative social influence and Informational social influence are major tools used in education and why.

The third part of the review will focus on the areas of achievement goals, reinforcement and interactions between pupils as part of theories of motivation and how those theories help answer the question posed in this study; does reward and competition aid learning? It will also look at how these are being implemented in schools and whether these policies are successful. In short answering the question whether competition is good in schools or not.

Finally, the aims of the research question will be analysed in relation to present theoretical models that the research is based upon.

In terms of this study learning is the desired outcome and can it be improved by competition and reward. Stated in another way does reward and competition act as a motivator to learning. Importunately does it act as a motivator even when the child or group of children are not receiving the perceived rewards. To start to look at this we should look at how motivation is perceived.

### 2.1 Motivation

Early theories of motivation start with the Greek philosophers Socrates 469/470-399 BCE and Plato (428-348 BCE) who believed that people pursued their goals due to certain drive that they had. This can be seen in later discursive theories such as Psychodynamic Theory as proposed by Freud (1930) with the basic drives that serve to motivate all thoughts being Eros (Life, sex) and Thanatos (death, aggression), are supposed to explain the phenomena of life (Freud, 1930). According to Freud's theory these underpin all motivation we as humans experience (Personality Synopsis, n.d.). This then indicates a behaviourist approach to motivation. Behaviourist such as Hull (1943) described motivation as drive (Meeting basic needs, eating drinking,

reproduction) as distinct from learning which would indicate the direction of behaviour. However, behaviourist moved away from these theories preferring more empirical and quantifiable theories such as Pavlov Classical conditioning using association and Skinner with operant condition with reinforcement and punishment leading to a Dual Process model (Chaiken and Trope, 1999) of initiation and continuation (habit) of behaviour. These theories are very much evident in schools today through both the reinforcement of behaviour through giving rewards and the punishment aspect of additional punishment (Positive Punishment) such as the giving of a demerit or negative reinforcement (taking away a positive) not allowed to go out to play at break time.

This however is a rather simplistic view of how to motivate children, and this has changed over time moving away from purely behaviourist view point to a more interactionist one returning more to the drives of the pupils and in this competition and group are the areas that are explored in this study. Cognitive theories have concentrated on the idea of the children setting goals for learning and achievement and how the maintenance of these goals and the progression of them occurs. In this there are two areas that have been looked at the physical aspects of the learning environment (Ames and Archer, 1988) and the situational aspects. This area of situational is the area that I am going to look at in terms of groups. This is an argument that neither (competition or group work) would make any difference to children as they have a fixed view of intelligence whereas we, for the purpose of this study, are assuming that children have an incremental theory of intelligence and place more emphasis of mastery and effort rather than purely goal achievement (Hong and Lin-Sielger, 2011). This growth mindset has evidence that it helps children to improve their academic performance (Blackwell et al., 2007).

## 2.2 Competition

First of all, it is worth defining competition which is a contest in which two or more people are engaged where typically only one or a few participants will win and others will not (Webster, 2007). It is often used as a reason to have competition in the classroom being that it reflects the real world however, this is not entirely true as competition is a self-imposed view whereas one could be described as working towards a goal as previously discussed (Johnson & Johnson, 2006). It could be argued

that the more competition that we create in the classroom the knock-on effect is to create competition outside of it. That is to say the pupils see that learning and progression can only be achieved through competition and therefore their cognitive construct (Schema) then takes this into their life after school.

#### The Effect of Situational Competition

Introducing competition into a task means that there is a sense of drama and urgency added which may shift the children's attention away from the task itself to purely to the idea of winning or losing (Johnson & Johnson, 2006). For example, in my experiment I am asking the pupils to complete a puzzle. Will the pupils be concentrating on the quality of effort, teamwork and communication or will it be all about the winning and the prizes afterwards? Thus, the purpose of the educational activity moves the learning goals from the intended. As a result, the activity becomes less something in which to engage for its virtues and becomes more a means to an end (Reeve & Deci, 1996). Therefore, process and the reflection on the task become less important than the completion of the task.

Taking this into account, it must be asked whether competition in the classroom is a good thing or not and as such a cost benefit analysis of introducing competition should be done. Things that should be carried out as part of the cost benefit are questions such as whether it adds to the learning of the child or whether it detracts. There are some other aspects that will be discussed in the group aspect of the literary review such as whether it adds or detracts from the cohesion of the pupil body.

There has been much debate about whether competition in the classroom is positive or negative and this was acted out in many schools and classrooms in the early 1990s in the United Kingdom (Dunne et al., 2007).

- Figure 18.2 Distinguishing Healthier from Unhealthy Competition (*Transformative Classroom Management*, By John Schindler, 2009)
- In Healthy Competition**
- o The primary goal is fun.
  - o The competitive goal is not valuable/real nor is it characterized that way.
  - o The learning and/or growth goal is conspicuously characterized as valuable.
  - o The competition has a short duration and is characterized by high energy.
  - o There is no long-term effect from the episode.
  - o All individuals or groups see a reasonable chance of winning.
  - o The students all firmly understand these points.
  - o Examples include: trivia contests, short-term competitions for a solely symbolic reward, light hearted challenges between groups where there is no reward.
- In Unhealthy Competition**
- o It feels real. The winners and losers will be affected.
  - o The competitive goal/reward is valuable/real, and is characterized that way.
  - o The learning task is characterized as a means to an end (winning the competition).
  - o Winners are able to use their victory as social or educational capital at a later time.
  - o Competition implicitly or explicitly rewards the advantaged students.
  - o Over time students develop an increasingly competitive mindset.
  - o Examples include: long-term point systems, competition for grades, grading on a curve, playing favorites, awards for skill-related performance.

Figure 1: Distinguishing Healthier from Unhealthy Competition (Schindler, J. (2009).

As I stated in my introduction, I found competition beneficial whilst at school and found that a lack of competition demotivating. This may be because of the fact that the teachers at the school saw that the winners of the competitions as being positive reinforced and therefore, would want to repeat the experience and the losers wanting to try harder so that they could be winners in the future. This may be unhealthy as it may lead to a fear of failure. That is to say that what drives the children to succeed is not the feeling of pleasure from winning but a fear of not winning which leads to a fragile ego construct which purely defines itself on a win/loss ratio (Schindler, 2009). This may lead to a decrease in motivation and lead the child to adopt an avoidance tactic towards competition and so be a barrier to learning or require competition, much like myself, to engage in learning (Schindler, 2009).

## 2.2 Groups

Researchers asked college students either to design a Web page advertisement for an online Journal and then refine it several times or to create several separate ones (Dow et al., 2010). The researcher posted the advertisement and assessed their effectiveness both by counting the number of clicks each generated. The experiment found that the designs which came about separately were better than those that were design as a group. They attributed this to the fact that the refinement of initial

ideas 'trapped' the participants in those initial decisions whereas the separate ones had many more to choose from. This indicates that group work could negatively affect the outcome. However, the area that I am hoping to show is that the competitiveness produced by the group enable learners independent of personality to achieve to a higher degree than they would otherwise. This can be seen from the literature review, *The Effects of Pupil Grouping* (Kutnik et al., 2005) in which is stated the fact that Within-class grouping has a greater potential to raise standards through personalising the learning experience for pupils especially enhancing the benefits when the group has a diverse range of abilities. This situational interest may be a psychological state that arises due to the specific feature of the task being intergroup competition. The use of which may engage and influence individual children's interest and motivation (Guthrie et al., 2006). So the group may act as the spark that leads to motivation and as that spark within the group takes hold of each individual and they invest individually into the task the motivation of all increases (Bricker and Bell, 2014).

However, as competition is introduced groups will place greater value on the outcome and less value will be placed on the process of learning. Attention will be put by the children on what it takes to win rather than what is being learned. This will therefore change the group dynamics putting greater emphasis on those children who are perceived to add value to the group winning the task and in turn taking away attention of the group of those who do not. This means that certain characters will be promoted possibly out of their skill level and others marginalised (Johnson & Johnson, 2006). Therefore, personality traits may control the group dynamics and so more assertive children will take centre stage and the group dynamics will change. This is something certainly to note and something to look for in my own experiment whether the introduction of competition does change the group dynamics and can this be controlled?

However, there are advantages with working in groups and this is highlighted by Vygotsky (1978) and these come with group work. His zone of proximal development (ZPD) can be explained by the difference between what a child can do with help and without help. This help can be defined as that from the teacher or from the child's peers (Vygotsky, 1978). This help is described by Vygotsky as scaffolding and lessens as the child develops their own skills in the area (Vygotsky, 1978). So, in terms of groups what is hoped happens and what a teacher should encourage is that children aid in the learning of each other allowing all those within the group to develop. One of the

problems with this is that if the teacher intervention is not appropriate a peer may be perceived as the competent peer but does not have the required skills and so leads the group down blind alleys and does not allow the group to develop. This is an area that can be seen in group work and so is something that I will look out for as in primary teaching it would be something that should be done to step in and point groups in the correct direction and not let negative scaffolding take place.

External rewards.

There is much debate about external rewards and it is something that I plan to use in my experiment and so is something worth looking at here. The effect on motivation may be negative or positive. If we look at some basic theories, then rewards if constantly given do not work in the long run but when coupled with a variance either through competition or over time then the reward system can continue to work (Hulac et al., 2016).

### 3. Methodology

#### 3.1 The Paradigm

The paradigm that I am basing my research on is behaviourism as shown by theorists such as Pavlov, Skinner and Bandura (Essays, UK. 2018)

I am carrying out research because evidenced based practice may lead to identifying effective strategies that can be used to inform improvement in mine and others teaching.

##### 3.1.1 Paradigm definitions and interpretations

These behaviourist theories have children adopting learning behaviour due to specific actions leading to specific responses. This can be due to association that is pairing a behaviour with something else for a given outcome For example: A child goes to school and at school they receive praise which makes them feel good therefor the praise is associated with school and therefore school is associated with a pleasurable experience (Classical Conditioning) (Hulac et al., 2016).

The second major theory in behaviourist psychology is that of operant conditioning in which positive/negative reinforcement and punishment are used, an example of this would be the child receives praise for a piece of work (Positive reinforcement) or a child is kept back after school for a misdemeanour (Positive Punishment) (Hulac et al., 2016). The final theory in behaviourism is that of Social Learning Theory in which the children learn vicariously from observing others, this can be seen in assemblies when a child receives praise and applause from others the children observe and want to reproduce the behaviour that led to their peer receiving the accolades that led to the praise (Bandura, 1977)

Understanding and implementing the use of behaviourist theory determines the level of change in the learner this is to say how much new learning is taking place.

##### 3.1.2 What this is ontologically (i.e. its main concepts/tenets)

The main concepts that I am looking at is part of the learning environment are the group and whether competition aids in the learning (Brown, 2008). I am therefore

ignoring many areas that enable or constrain learning. The main concept is whether reward aids in learning and taking this further reward through competition aid learning. The basic concept of this is whether to motivate a child to learn is an intrinsic reward worth using or not and if it is does a competition between pupil groups lead to even better learning outcomes i.e.: an increase in effort. As part of this it is important to look at that group dynamics and whether the outcomes are improved for all or whether the individual differences will mean that it works for some and not others. This is based on the idea of behaviourism and could be looked at as simply Operant Conditioning as proposed by Skinner based upon Thorndike's (1898) (Essays, UK. 2018) previous work. That is to say that positive reinforcement should lead to improving the behaviour. The other concepts within this are that due to the idea of normative and informational social influence the children in the group will work hard and learn from each other similar to Vygotsky's theory of scaffolding and so the group should have an overall improvement (Vygotsky, 1978).

To shorten, it could be put as power of competition and how it effects motivation on attention, sustained physical effort, and learning as well as looking at the two sides of competition being whether intergroup versus interindividual competition has an effect.

### 3.1.3 What this means epistemologically (i.e. how knowledge is perceived)

The findings of the study will form part of other studies into similar area but less in the primary sector in which there is much literature which states that competition is bad for younger members of classrooms but does not back this up with research "*but little or none is appropriate for very young children*" (Schindler, 2009 Ch. 18-g) There is much research into the power of rewards to aid motivation and this has been taken into the area of competition for example Le Bouc and Pessiglione (2013) found that, when participants in their experiment believed they were competing, there was an increase in effort which suggests an increase in motivation (Dimenichi and Tricomi, 2015). Research carried out by Wittchen et al. (2013) shows that collaborative competition has an effect on the motivation of the individuals to a greater extent than if individuals are doing it themselves.

So my experiment is done in the context of previous experiments which have found that competition improves motivation and that group competition increases this



motivation. The difference between these studies is the age as all of the previous studies have been carried out on secondary pupils and not at the primary level.

#### 3.1.4 How the paradigm links to methodology

Bruner (1986) states that there are two ways of knowing (scientific and narrative) and due to my belief, that in this experiment both the Empiricist research method and the Interpretative method will lead to a greater depth of understanding to the question posed then a combination of both seems the best method to use. A Pragmatism method will allow me to have the advantage of having conclusions that will look at the statistical analysis of the results whilst not losing sight that each individual child is important and that as educators we have a duty of care to work towards the best outcomes for all those in our care (Austin, 2016).

The paradigm links to the methodology in the fact that the reward acts as a motivator and so this must be controlled for so part one of the experiment is to see the effect that this has (A more Scientific method). Then part two of the experiment is to see whether competition between the groups adds to the motivation (Scientific Method). As part of the idea of looking at wider areas of the task as in the behaviour of individuals and whether they act as a group in an individual manner behaviour sheets for them will be filled in (Narrative). This shows that the method best suited to this research is a Pragmatism i.e.: a mixture of both (Austin, 2016).

### 3.2 The Methodology

#### 3.2.1 Methodological definition

The experimental method will one is naturalistic (Austin, 2016). That is to say that the children will be at school in their normal environment and the Independent Variable will be manipulated and the Dependent variable measured.

The experimental design will be one of overt observation (Dawson, 2009) as I will be carrying out the experiment and recording the results. I will also be a participant in the experiment in the fact that I will be setting the tasks for the children to carry out.

The first experiment design will use independent measures (Howitt & Cramer, 2008). As each group will work independently of each other one group with the knowledge that they will receive an award and the other without this knowledge. The second experiment all will be involved and so from the first to the second experiment this will

be a repeated measures design (Howitt & Cramer, 2008), as all the children in experiment one will be taking part in experiment two.

The type of sample that I am using is opportunity sampling (Howitt & Cramer, 2008), as I am using the children that are at the primary school that I was on placement with.

### 3.2.2 Issues of validity and reliability in relation to the method

Using a Naturalistic Method of experimentation means that there are more likely to be less controlled aspects than there would have been in a laboratory setting. Therefore, the effect of extraneous variables becoming confounding variables is a problem with the method (Howitt & Cramer, 2008).

The problem with using an independent measure is the fact that my group is small and so splitting the groups up means that population validity is questionable (Miller, R. 2003). The second part of the experiment which has repeated measures as its method does mean that I do not need as many participants but could have problems due to order effects (Miller, 2003) and the fact that demand characteristics from the children guessing what the experiment is about could have an effect.

I am also doing overt observation (Dawson, 2009), of the children this could act as a demand characteristic also leading to the pupils believing that they are being graded in some way and therefore they could try harder thus introducing an extraneous variable that would confound the results. This could also be due to the demand characteristics of social desirability (Dawson, 2009), as the children may want to impress the teacher and so change their behaviour. Another aspect due to myself carrying out the experiment could result in demand characteristics from me in the fact that I may steer the experiment towards the outcomes that I desire.

The final aspect that could affect the reliability and validity of the experiment in this fact that I am using opportunity sampling. This means that the sample may not be representative of the whole primary population of the UK and so could be criticised as lacking population validity.

### 3.2.3 Tools of data collection with this method, including your choice of methodology

The method of data collection is by observation through the use of forms for predetermined criteria and a section for notes see diagram below (Figure 2).

**Behaviour check list**

Students first name: \_\_\_\_\_ School: \_\_\_\_\_  
 Date: \_\_\_\_\_ Year: \_\_\_\_\_

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					
cooperating					
Enjoyment					
Pleasure					
Argument					
Becomes verbally aggressive when angry					
Becomes physically aggressive when angry					
Attempts to resolve conflict					
Asks to go to the toilet or other areas around the school to avoid the task.					
Sleeps					
Disruptive					
Participates in discussions					
Reads aloud to the group					
Works independently					
Daydreams					
Isn't sitting down properly					
Seems sad or depressed					
Try's to control peers					
Refuses to participate teacher's attention					
Completes projects					
Talks over teacher					
Talks over others					
Other:					
	Not at all	not	A little	yes	Fully
Total:					

Notes: without reward

Figure 2 Behaviour Checklist (Appendix B)

Observation Time: 15 minutes per experiment

Observation Situation: Classroom (same for each experiment)

Observation Participants: four year 3 children and four year 4 children. Same participants for each experiment)

Groups: Random allocation of two from each year (stratified)

The observations was done over a fifteen minute period assigned to each experiment. The sheet was filled in when opportunity arose or experiment.

For each group the time taken to complete the task was recorded at the bottom of the last group members sheet. To record the time I used a stopwatch on my phone.

During and after each experiment I wrote notes either filling in the Likert scale as shown in Figure 2 (This was usually during the experiment) and making notes and recording the time after the experiment (See appendix B). This therefore was structured in method (Dawson, 2009).

This means I have a mixture of qualitative data and quantitative data all of which will be useful.

#### 3.2.4 Explore issues of reliability and validity of method

There are a number of problems with reliability and validity of the method that I have used.

The first is that due to circumstances beyond my control and schools being closed down the number of participating pupils was reduced to eight in total with the groups each being four. This means that the population validity is further reduced as the sample is small.

Having said this the experiment was carried out as planned and so, although there is a problem with sample size, the data can still be seen to represent the population group that it is aimed at (Dawson, 2009).

Another issue that arose was that I was hoping to use years 5 and 6 but was allocated years 3 and 4 as the pupils that I could use. This should have little effect on what I am looking at as one of the areas that I was hoping to study was the effect on competition at primary level and these do represent primary school children.

The problem of validity in terms of the Natural method that the experiment has is one of controlling all the external variables (Tajfel, 1974). In this, I have kept the instructions clear and minimal there is not extrinsic reward outside of that within the experiment so this should not cause demand characteristics. Although due to the participation of myself within the experiment I could become an extraneous variable with members of the groups wanting to please me and this being the motivating factor. This is hard to control for but would be picked up by the behaviour form and notes (Dawson, 2009). The experiments were done one after each other so variables such as time and tiredness should not have an effect, but it could be argued that order effects could take place. That is the pupils become quicker at solving puzzles because the second time round they practised doing puzzles and are therefore better.

One aspect is that I am going to look at minimising the effects from external variables using some of the concepts from the Tajfel minimal group study (Tajfel, 1974). This should then mean that extraneous variables are controlled and that they should not act as confounding variables for the results. Meaning that the validity of my research is good. However, Learning environments are open systems and so whether my research

is valid as it is only looking at one aspect of learning and thus would lack ecological validity in the fact that it is controlling for extraneous variables which would undoubtedly have an effect on the children's learning such as social background and prior education.

One aspect that would have been nice to test the reliability of my results would have been to replicate the experiment with another group of children but unfortunately, I did not have time to do this. This then will be a limitation to my whole project, however, this idea and recommendation of practice can be used in the future to impact and enhance research.

### 3.3 The Process



Figure 3 Example of puzzles used

#### Experiment

##### Experiment 1

Have a class: Split class in 2.

- Group A do puzzle task (See Figure 3) and record behaviour using behaviour sheet and time (See Figure 2). It is important that the second group do not know that Group A are a reward.

Group B do puzzle task (See Figure 3) and record behaviour using behaviour sheet and time (See Figure 2). It is important that the first group do not know that Group B are not receiving a reward.

After a gap of 15 minutes.

#### Experiment 2

Have a class: Split class in two. Allow them to bond as a group and keep them in same room. State that the group who do the best will receive an award.

- Group A do task and record behaviour and results from task using forms as shown in Figure 2.
- Group B do task and record behaviour and results from task using forms as shown in Figure 2.

#### 3.3.1 Establishing contact with context

The method of gaining approval was through the Head teacher and primary teacher of the class I was to help with as part of my placement (Austin, 2016). I was doing my placement at the school and explained why I would like to do research (For my Dissertation) and the topic of my research (does reward and competition in groups aid learning in a Primary setting?). I organised permission slips and these are shown in Appendix C (Austin, 2016). They were happy with this and so gave me approval to proceed. This was partly due to the fact that the experiment would not adversely affect the pupils in any way and that it had educational value to the pupils of solving puzzles. One aspect that was highlighted at this point was the reward as sweets were seen as something that was not to happen so these were changed to scented erasers.

#### 3.3.2 Gaining ethical approval and consent

The first aspect of gaining approval is to go through the University system of applying for approval (See appendix A).

Then talking to the Head teacher and class teacher of the school and the permission slips.

I do also intend to comply with the Data Protection Act (1998) and the General Data Protection Regulation (2018) as highlighted by Catherine Dawson in *Introduction to Research Methods* (Dawson, 2009).

### 3.3.3 Problems encountered within the process.

I had a problem that it was felt that my grammar and punctuation was poor (See Appendix D) and so did not reflect well. I updated this.

I was concerned about the ethical approval and contacted my tutor (see email in Appendix D). He assured me that this was all completed.

#### 4. Results & Analysis

##### 4.1 Introduction, including rationale for how results and analysis is integrated.

To begin with I will statistically analyse the results from the experiments and show these results without much discussion saying whether the hypotheses of firstly whether reward acts as a motivator to children and secondly whether competition acts as a motivator to children.

The second part will be to look at the results individually for each child to see how this affected them individually.

After looking at the results, I will look at the impact and compare this to the literature that I have read to see if the results compare favourably with them and then look at the impact that this research could have. It is important that whilst the statistical analysis is done and the thematic analysis is carried that both this quantifiable data and qualitative data is combined to reach conclusions about whether competition is a useful tool in primary level education.

##### 4.2 Approach to analysis.

I am going to use four main ways of analysing the data.

The first are statistical analysis and this will be done in the following ways.

###### Experiment 1:

Is a test of difference using independent groups and interval data. I have therefore chosen the Related T test. This will be explained in 4.2.1

I will also look at a comparison of the mean scores – 4.2.1a

###### Experiment 2:

Experiment 2 takes the data from Experiment 1 (Condition 1) and compares it against the data in Experiment 2 (Condition 2). This is a repeated measures design of a test of difference and uses interval data. This will be explained in 4.2.2

I will also look at a comparison of the mean scores – 4.2.2a

The second is a thematic analysis of the individual responses of the pupil's behavioural sheets and the comments taken at the time. This will be shown in 4.2.3



#### 4.2.1 Experiment 1

There are a number of ways to analyse the results and these are at an individual participant level and at the group level to answer the hypothesis proposed earlier in the investigation. In the case of adding a reward to groups then the results are a simple comparison as it is a test of difference between the two groups.

The results were that group A who understood that they were receiving an award finished the task in a mean time of twelve minutes and Group B who were not receiving a reward finished in a mean time of fourteen minutes. So as a test of difference for independent measures is appropriate with interval data. The test that I chose is the related T test.

Group 1 completed their task individually at 11, 12, 13 and 12 minutes giving a mean score of 12 minutes.

Group 2 completed their task in 13, 12, 16 and 15 minutes giving a mean score of 14 minutes.

Using the Independent T test for a directional hypothesis:

The 4 participants who received the reward ( $M = 12$ ,  $SD = 0.82$ ) compared to the 4 participants in the control group ( $M = 14$ ,  $SD = 1.83$ ) demonstrated significantly longer times to complete the tasks. The t-value is -2. The p-value is .046213. The result is significant at  $p < .05$ .

So I can accept the hypothesis that reward improves the time taken to do a task and therefore acts as a motivator to children.

##### 4.2.1a

Looking at the mean scores it can be seen that rewarding pupils adds to their motivation, shown in Figure 4.

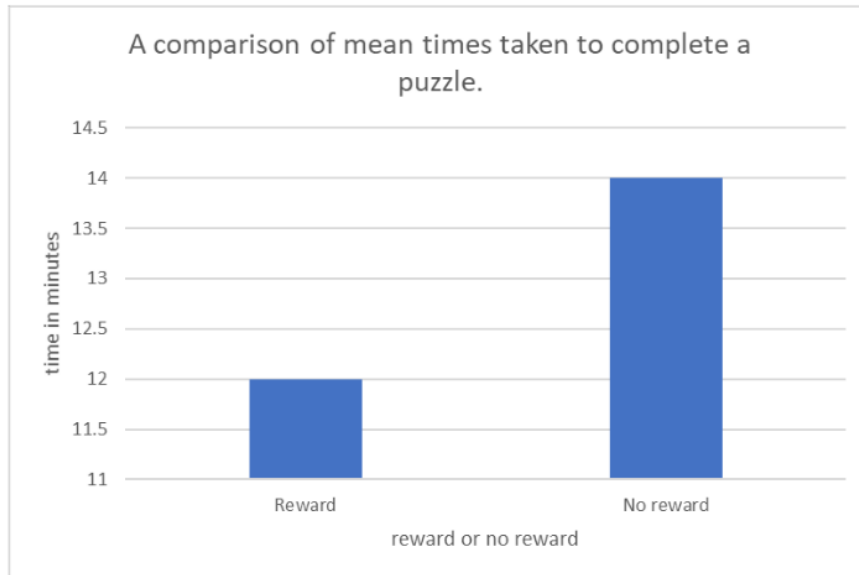


Figure 4: Mean time taken to do puzzle with or without reward.

#### 4.2.2 Experiment 2

The second part of my experiment is harder to analyse as the first part is the control to mitigate the effect of reward.

The Hypothesis is that competition will improve the results in this case measured in the time taken to complete the puzzles. In the experiment, the groups are pitted against each other with the winning group gaining the reward. The statistical analysis takes the mean time of the second experiment and compares it against the mean time in the first experiment thus removing the effect of reward. This therefore is a repeated measures design of a test of difference using interval data. The test chosen was Wilcoxon Signed-Rank Test.

The results are as followed and were analysed using the website <https://www.socscistatistics.com/>.

Result 1 - Z-value

The value of z is -2.1129.

Note: N (7) is not large enough for the distribution of the Wilcoxon W statistic to form a normal distribution. Therefore, it is not possible to calculate an accurate p-value.

#### Result 2 - W-value

The value of W is 1.5. The critical value for W at N = 7 ( $p < .05$ ) is 3.

The result is significant at  $p < .05$ .

This shows that there is a significant difference and therefore I can accept the hypothesis that competition improve the motivation of the children.

#### 4.2.2a

Looking at the mean scores it can be seen that adding competition to activities that pupils are taking part in adds to their motivation, shown in Figure 5.

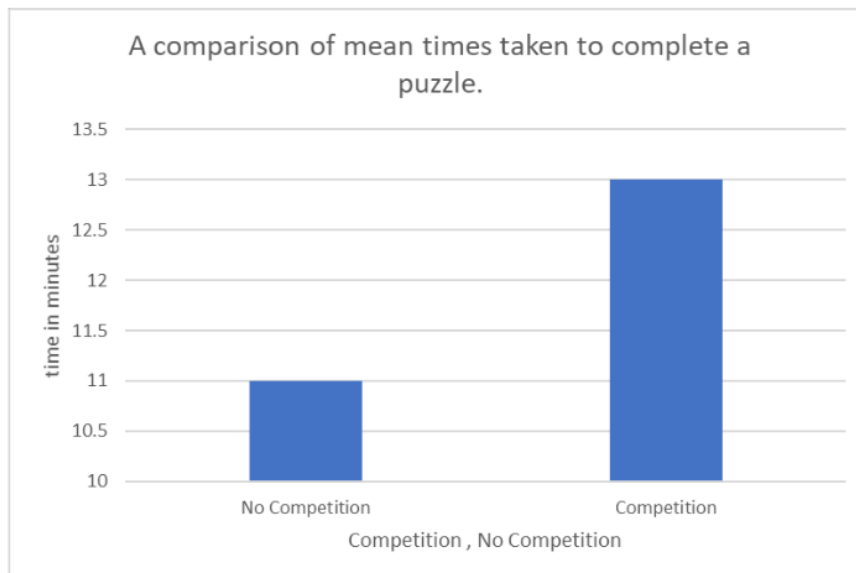


Figure 5: Mean time taken to do puzzle with or without competition.

#### 4.2.3 Experiment 3

Thematic analysis.

I used an observed scale for each behaviour based on the words: not at all, not, a little, yes, fully. I operationalised the scale by scoring 1, 2, 3, 4, 5 respectively.

Dependent upon my observation I scored them on the sheet as shown in Figure 2.

The observational form can be split into positive behaviour and negative behaviour. There are twelve negative behaviours and ten positive. This gives a slight bias towards a negative score but also some of the categories could be debatable but they were as I saw them through observation such as hyperactivity was seen as a positive as it was directed towards the puzzle as I decided that teacher intervention was a negative as this tended to be to cajole the child to stay on task. The results matched with the statements that were added about the pupils.

A summary of the results are below.

	Negative	Positive	Total	Child	Outcomes
Exp 1	17	38	55	a	reward
*	26	23	49	b	reward
	25	39	64	c	reward
	28	34	62	d	reward
<b>Total</b>	<b>96</b>	<b>134</b>			
	30	45	75	e	no reward
	26	44	70	f	no reward
	25	33	58	g	no reward
	23	32	55	h	no reward
<b>Total</b>	<b>104</b>	<b>154</b>			
Exp 2	34	45	79	a	winners
	34	35	69	b	winners
	29	42	71	c	winners
	13	37	50	d	winners
<b>Total</b>	<b>110</b>	<b>159</b>			
	24	35	59	e	loser
*	27	24	51	f	loser
	24	33	57	g	loser
*	27	25	52	h	loser
<b>Total</b>	<b>102</b>	<b>117</b>			
	<b>Total</b>	<b>Total</b>			
	412	564			

Figure 6: Summary of Observations.

What comes from this is qualitative data which is rich in detail and does lead to greater insight than that of the purely statistical analysis. For instance, good behaviour was scored the lowest for the losing team who previously when not given a reward had gained a high positive behaviour score. This may indicate that competition leads to lessening of positive behaviour. Going further into the data there are three incidents of pupil's behaviour being scored as overall negative (These are starred in the Figure 6 (Summary of Observations)). Matching these scores with the observational text for example: child H, "struggling, sat on floor and got help from G found it annoying because H could do it just was taking more time for H to do. The task took thirteen minutes rounded to the minute to complete". Indicates that this child in the losing team was less engaged than they had been previously when not in competition and did not receive a reward and took the same amount of time to complete the task: - "Kept to their self's and did the task and waited for others to finish. The task thirteen minutes rounded to the minute to complete" (Appendix B). Again, this indicates that the child did not react well to the competitive aspect of the exercise.

#### 4.4 Overall Medium and range.

Other aspects of the data could be looked at in more detail such as the range of data compared against the means.

	Experiment 1		Experiment 2	
	Reward	No reward	Winners	Losers
Mean	12	14	10	12
Range	2	4	4	3

*Figure 7: Mean and Range of overall data.*

This simple table Figure 7 (Mean and Range) shows that the mean decreases with the introduction of competition but the range increases overall and doubles for the winners. On the face of it this may indicate a greater amount of individual differences which again is borne out by looking at the behaviour sheets for each of the children and that the introduction of competition affects each child in a different way as discussed in 4.2.3.

## 5. Discussion

### 5.1 Introduction highlighting key themes within the discussion

In my discussion I would like to look at 4 main aspects.

- 5.2 What the data indicates
- 5.3 Problems with my data and evaluation of my research
- 5.4 How this relates to previous research
- 5.5 Conclusion

### 5.2 What the data indicates

Although much of this is discussed in the statistical aspect of this (Section 4). It would be a good idea to bring it all together. The research has shown that there is an effect of both reward and of competition in the motivation of children and that this motivation affects the child to a greater or lesser extent depending on the individual and in fact may not have an effect at all. It also shows that competition in itself is a motivator to children at a primary level.

On the face of it the data indicates that we should use reward and competition at this level of a child's education. However, the qualitative data indicates another aspect and that is the individual differences between the children and that behaviour may for some become negative if competition is used incorrectly or without thought.

### 5.3 Problems with my data and evaluation of my research

There are a number of problems with my research. The first is that the sample size was small and therefore generalising it to the rest of the population would be difficult to allow. This was shown in the Wilcoxon Signed-Rank Test (4.2.2) where the p value could not be used as the sample was too small to assume a normal distribution.

Also the method of the experiment was difficult to conduct whilst being involved and knowing what outcomes that I expected and so the demand characteristic of experimenter bias could have happened and I would not be aware of this as I carried out the experiment without anyone else being involved.

The idea of minimizing external variables in this case is very nearly impossible because the variable of family situations and how the parents or primary care giver view

competition within the home is one that could not be controlled for and since there was no matching within the groups then I could have ended up with all the competitive pupils in one group and none in the other group. This was not controlled for.

The behavioural sheet was purely something that was down to my judgement and so was entirely subjective. This could have been improved by having a second observer so that we could correlate our results to see if they matched and so had validity.

The last aspect would be of replicability which I did not have the chance to do which would have given the experiment some form of consistency. What I would have liked to have done given some more time is to repeat the experiment and see if similar results were obtained. This would mean that there would be a constancy in the results and therefore underline the findings as more credible.

#### 5.4 How this relates to previous research

As can be seen in the research motivation can be split down into three factors: that of reward, competition and group. All of these were discussed in the literature review in section 2.

If we look at the idea of reward then the straight forward giving of reward made a significant difference between the two groups. That is the group with the reward performed better than the group without. It is important to remember that the group receiving the reward were told that they would get the reward at the end with no stipulation of finishing the task. In simple terms giving a simple reinforcer of positive behaviour without expectation leads to greater learning and this operant conditioning model can be seen in many studies such as "the application of operant conditioning techniques in a secondary school classroom" which showed that through the use of praise and disapproval had the desired effect of the children's behaviour (McAllister et al., 1969). This study supports the findings that I also found and also this study discusses the same type problems such as not being able to distinguish between the effect on individuals which through the use of the thematic analysis and through looking at the range we can see a similar problem of that there are individual differences. As put in "the application of operant conditioning techniques in a secondary school classroom" - "It might be argued that a group-oriented approach will not function in the

same way with all members of the group.” However, the study goes on to say that a group use of reward is works for the majority will enable the teacher to concentrate more effort on those that it does not work for. A positive may be gained by this group use of reward. The article also warns that overuse of reward giving may lead to the children having an expectation of reward and therefor develop a dependency on it and therefore, if over used, may stop them developing their learning in a more intrinsic manner.

The next aspect was whether competition leads to improved performance. My research shows that this is true and that it acts as a positive in motivating pupils. However, DiMenchi and Tricomi (2015) illustrated that competition can invoke high anxiety among participants which can lead to a decrease in performance (Darke, 1988) and may have a negative effect of long-term memory (Cassady, 2004). It may improve performance for some individuals but not all. It also should be noted that in “Examining the Use of Competition in the Classroom” by John Shindler (2009) the discussion between good and bad competition occurs as referred to in the literature review. The book goes on to talk about the fact that winners seem happy and losers try harder which is certainly the case in my research. It is argued however that winners feel satisfaction from the idea of being ahead of somebody else and that this constant comparison with others to gain satisfaction leads to a fear of failure (Vockell, 2004) and is a fragile ego construction and leads to a loss of intrinsic motivation and defining of the individual child in terms of a win loss record. As I stated in the introduction of the project one of the reasons that I undertook the research is because I found my own schooling very much based on the idea of competition and as I come to the end of the research I have started to question this stand point and recognise aspects of a fragile ego construction within myself and that this lack of intrinsic motivation because of overuse of extrinsic motivation has led to feelings of inadequacies and a lack of internal motivation. Also, I can recognise that some of my own loss of interest in learning unless there is a competitive element has been due to the overuse and misuse of competition in my own education.

The final aspect of my research was centred on the idea of groups and that group work can be improved due to the motivation that occur through the use of competition. In this it was obvious that scaffolding as explained by Vygotsky as the: “role of teachers and others in supporting the learner’s development and providing support structures to get to that next stage or level” (as cited in Raymond, 2000), occurred during the



experiment for some “when ‘E’ finished their task they went and helped others that hadn’t finished the task or were struggling to do the task. Student “E” was first to finish from there group and straight away went and helped student F that was struggling with the task.” (Appendix B: Behavioural Checklist) but did not for others “- Kept to their self’s and did the task and waited for others to finish.” (Appendix B: Behavioural Checklist). As discussed previously, this indicated that competition worked for some but not for others and that individual differences and enjoyment of competition was shown. In the classroom this must be closely monitored as not to lead to members of the group becoming isolated or a member of the group becoming the ‘favourite’. However, as discussed in “Examining the Use of Competition in the Classroom” (Shindler, 2009), the use of competition to engender intra-group cooperation is one of the healthy uses of competition (see figure 1).

## 5.5 Conclusion

Overall the research has shown that competition can be used in a positive manner as a motivation for pupils at primary level and can lead to pupils both enjoying and learning at an improved rate however more research should be done on what is healthy and not healthy competition as outlined by Shindler (2009). The conclusion at the end of Chapter 18 in *Transformative Classroom Management* by John Shindler (2009) in which he states:

“Approach the use of competition as you would toxic paint or an electric power tool. It can produce beautiful results, but unless we take great precautions, we will regret putting it in the hands of young people. If it seems harmless, it is because we do not perceive the threat clearly. While consequences for promoting a fear of failure are not the same as they would be if a student were to injure themselves with a power tool, we need to be just as safety conscious. Use the tool of competition sparingly and with care.”

Is one, that I would, having carried out this research, agree with as the dangers of introducing competition was obvious in the thematic analysis although less obvious in the quantitative data which indicated on the face of it that competition aids learning but

this is an over simplistic view of a complex tool within teaching which has a wide range of affects and ramifications to the learners.

Importantly, one of the conclusions from How people Learn II: Learners, Context and Cultures states that, "Motivation is influenced by the multiple goals that individuals construct for themselves", so as teachers we must be careful not to create extrinsic goals in which the children base their motivation on and allow them to develop their own intrinsic motivators. This is especially important at that the primary level as this will follow them through their educational life and have a long-lasting affect upon their education and their perception of education.

If I go back to one of my earlier statements in this project which is quoting a much-used sentence from the government:

"Educational Excellence Everywhere"

(Department for Education, 2016) then, I must conclude that if this the case then competition and reward must be used with care as if used as a crude stick to motivate all pupils then it will seemingly work for many but may take away their intrinsic believe in learning for the benefit of themselves and therefor in the long-term act as a negative for their long-term education.

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# Appendices

## Appendix A – Consent Sheet blank

### Consent Form Template For Parents of Participant Child.

#### 1. TITLE OF RESEARCH PROJECT

Does reward and competition aid learning?

**Name of Researchers:** *Tobias Stanyer*

- I confirm that I have read and understand the participant information sheet dated **13/02/2020** for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- I understand that the participation of my child is voluntary and that I am free to withdraw my child at any time without providing a reason.
- I understand that data collected during the study may be looked at by individuals from the University of St Mark & St John for regulatory purposes. I give permission for these individuals to have access to my child's data as collected in the study.
- I agree to my child's interview being audio recorded. The recording will be transcribed and analysed for the purpose of the study and destroyed after transcription.
- I consent to verbatim quotes being used in publications and conference presentations. My child will not be named although I understand that there is a very slight risk of identification.
- I understand that participation for my child will include a group exercise in which they will attempt to solve a puzzle and that there will be an element of competition between groups.
- I understand that the results of the study may be published and / or presented at meetings or conferences and may be provided to research funders. I give my permission for my child's anonymised data to be disseminated in this way.
- I consent to the data being stored for the length of the publication of the dissertation. Any recorded material will be destroyed at the end of the data collection.
- I agree to the data I contribute being retained for any future research approved by a Research Ethics Committee.
- I understand that data will be stored on T Stanyer's secure area on the University ICT system

- I understand that I will not benefit from the commercialisation, if any, of data or derivatives as a result of this study.

- I agree for my child to take part in the above study

Signed ..... (Research participant)

Print name .....

Date .....

Name of person taking consent .....

Date .....

Signature .....

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.



Appendix B – Observational Sheets

The sheets Below this are the pupils who received reward

Group A

Experiment 1

## Behaviour check list

Students first name: A      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating		1			
Enjoyment				1	
Pleasure			1		
Animated		1			
Becomes verbally aggressive when angry	1				
Becomes physically aggressive when angry	1				
Fights to resolve conflict	1				
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions	1				
Reads aloud to the group		1			
Works independently					1
Daydreams	1				
Isn't sitting down properly	1				
Seems sad or depressed	1				
Try's to control peers Refuses to participate teacher's attention		1			
Completes projects			1		
Talks over teacher			1		
Talks over others				1	
Negative total score:	8	1	1	1	0
Positive total score:	1	3	3	3	2
	Not at all	not	A little	yes	Fully

Notes: **with reward** - They sat at the table and did there puzzle.

The task took this pupil (12 minutes) rounded to the minute

Total negative: 17. Total positive: 38

## Behaviour check list

Students first name: B      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating			1		
cooperating		1			
Enjoyment			1		
Pleasure		1			
Animated		1			
Becomes verbally aggressive when angry			1		
Becomes physically aggressive when angry	1				
Fights to resolve conflict	1				
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions	1				
Reads aloud to the group		1			
Works independently				1	
Daydreams				1	
Isn't sitting down properly				1	
Seems sad or depressed			1		
Try's to control peers Refuses to participate teacher's attention		1			
Completes projects		1			
Talks over teacher		1			
Talks over others		1			
Negative total score:	4	4	2	2	0
Positive total score:	1	6	2	1	0
	Not at all	not	A little	yes	Fully

Notes: **with reward** - They gave up when the others in the group finished. They were sat on the floor and found the task more frustrating than fun. Their teammate had to help them finish the puzzle after they were done with their own puzzle.

The task took this pupil (13minutes) rounded to the minute

Total negative: 26 Total positive: 23

## Behaviour check list

Students first name: C      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating				1	
Enjoyment				1	
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry		1			
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions				1	
Reads aloud to the group				1	
Works independently				1	
Daydreams		1			
Isn't sitting down properly			1		
Seems sad or depressed	1				
Try's to control peers Refuses to participate teacher's attention	1			1	
Completes projects					1
Talks over teacher			1		
Talks over others			1		
Negative total score:	4	4	3	1	0
Positive total score:	0	0	2	7	1
	Not at all	not	A little	yes	Fully
Total:	4	4	5	8	1

Notes: **with reward** - They completed the puzzle and enjoyed doing it. As soon as C was done, they helped others who were struggling with the task. Didn't take over the task just helped. They were sat at the table .

The task took this pupil (12 minutes) rounded to the minute

## Behaviour check list

Students first name: D      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating			1		
Enjoyment				1	
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry	1				
Fights to resolve conflict	1				
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive					1
Participates in discussions			1		
Reads aloud to the group	1				
Works independently				1	
Daydreams			1		
Isn't sitting down properly				1	
Seems sad or depressed		1			
Try's to control peers Refuses to participate		1			
teacher's attention			1		
Completes projects			1		
Talks over teacher				1	
Talks over others				1	
Negative total score:	4	3	2	3	0
Positive total score:	1	0	4	4	1
	Not at all	not	A little	yes	Fully
Total:	5	3	6	7	1

Notes: **with reward**- Went on the floor and was hyperactive, but was doing the task head down and focusing but finding it a little harder than the others.

The task took this pupil (12 minutes) rounded to the minute

Group Below are competition winners

Experiment 2

## Behaviour check list

Students first name: A      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating					1
Enjoyment					1
Pleasure					1
Animated			1		
Becomes verbally aggressive when angry				1	
Becomes physically aggressive when angry		1			
Fights to resolve conflict				1	
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive					1
Participates in discussions				1	
Reads aloud to the group				1	
Works independently				1	
Daydreams	1				
Isn't sitting down properly				1	
Seems sad or depressed		1			
Try's to control peers Refuses to participate			1		
teacher's attention					1
Completes projects					1
Talks over teacher			1		
Talks over others				1	
Negative total score:	3	2	2	4	1
Positive total score:	0	0	1	3	6
	Not at all	not	A little	yes	Fully
Total:	3	2	2	7	7

Notes: **Competition Winners** - fully engaged and really wanted win. Was more hyperactive and talkative.

The task took this pupil (8 minutes) rounded to the minute

Total negative: 34. Total positive: 45

## Behaviour check list

Students first name: B      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating				1	
Enjoyment				1	
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry				1	
Becomes physically aggressive when angry				1	
Fights to resolve conflict			1		
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive				1	
Participates in discussions			1		
Reads aloud to the group		1			
Works independently			1		
Daydreams			1		
Isn't sitting down properly			1		
Seems sad or depressed			1		
Try's to control peers Refuses to participate teacher's attention		1			
Completes projects				1	
Talks over teacher			1		
Talks over others			1		
Negative total score:	2	1	6	3	0
Positive total score:	0	1	4	4	1
	Not at all	not	A little	yes	Fully
Total:	2	1	10	7	1

Notes: **Competition Winners** - Head down and doing the work. Found it hard and had to get help from others. Talked to self and got angry, tried forcing pieces together.

The task took this pupil (12 minutes) rounded to the minute

Total negative: 34. Total positive: 35



## Behaviour check list

Students first name: C      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating				1	
Enjoyment				1	
Pleasure				1	
Animated				1	
Becomes verbally aggressive when angry			1		
Becomes physically aggressive when angry			1		
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive				1	
Participates in discussions				1	
Reads aloud to the group			1		
Works independently					1
Daydreams	1				
Isn't sitting down properly				1	
Seems sad or depressed		1			
Try's to control peers Refuses to participate teacher's attention			1		
Completes projects					1
Talks over teacher	1				
Talks over others			1		
Negative total score:	4	2	4	1	1
Positive total score:	0	0	1	6	3
	Not at all	not	A little	yes	Fully
Total:	4	2	5	7	4

Notes: **Competition Winners** - was hyperactive and engaged in the task. More frustrated this time round.

The task took this pupil (11 minutes) rounded to the minute

Total negative: 29. Total positive: 42

## Behaviour check list

Students first name: D      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating			1		
cooperating				1	
Enjoyment				1	
Pleasure			1		
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry		1			
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions		1			
Reads aloud to the group					1
Works independently			1		
Daydreams			1		
Isn't sitting down properly			1		
Seems sad or depressed	1				
Try's to control peers Refuses to participate teacher's attention					1
Completes projects				1	
Talks over teacher		1			
Talks over others		1			
Negative total score:	3	5	2	1	1
Positive total score:	0	1	5	3	1
	Not at all	not	A little	yes	Fully

Notes: **Competition Winners**- completed the task second and wasn't as excited as they were in the first one, this maybe because they wanted to come first not second.

The task took this pupil (9 minutes) rounded to the minute

The sheets Below this are the pupils who did not receive a  
reward

Group B

Experiment 1

## Behaviour check list

Students first name: E      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating					1
Enjoyment					1
Pleasure					1
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry	1				
Fights to resolve conflict				1	
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive					1
Participates in discussions				1	
Reads aloud to the group				1	
Works independently				1	
Daydreams	1				
Isn't sitting down properly				1	
Seems sad or depressed	1				
Try's to control peers Refuses to participate		1			
teacher's attention					1
Completes projects					1
Talks over teacher			1		
Talks over others					1
Negative total score:	5	2	1	2	2
Positive total score:	0	0	1	3	6
	Not at all	not	A little	yes	Fully

Notes: **no reward** - fully involved

The task 15 minutes rounded to the minute

Total negative: 30. Total positive: 45

## Behaviour check list

Students first name: F      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating				1	
Enjoyment				1	
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry			1		
Becomes physically aggressive when angry		1			
Fights to resolve conflict			1		
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive					1
Participates in discussions					1
Reads aloud to the group				1	
Works independently					1
Daydreams	1				
Isn't sitting down properly			1		
Seems sad or depressed	1				
Try's to control peers Refuses to participate	1				
teacher's attention					1
Completes projects					1
Talks over teacher		1			
Talks over others			1		
Negative total score:	5	2	4	0	1
Positive total score:	0	0	1	4	5
	Not at all	not	A little	yes	Fully

Notes: **no reward** -As soon as they finished, they helped others. They were verbally stressed though.

13 mins

Total negative: 26. Total positive: 44

## Behaviour check list

Students first name: G      School: N/A

Date:28/02/2020      Year:3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating					1
cooperating				1	
Enjoyment				1	
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry		1			
Fights to resolve conflict				1	
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive				1	
Participates in discussions					1
Reads aloud to the group				1	
Works independently				1	
Daydreams	1				
Isn't sitting down properly				1	
Seems sad or depressed	1				
Try's to control peers Refuses to participate		1			
teacher's attention				1	
Completes projects				1	
Talks over teacher			1		
Talks over others				1	
Negative total score:	4	3	1	4	0
Positive total score:	0	0	1	9	2
	Not at all	not	A little	yes	Fully
Total:	4	3	2	13	2

Notes: **no reward** - Super chatty and completely of topic. They were stressed and chatty. Need help from others but completed the task.

The task 16 minutes rounded to the minute

Total negative: 25. Total positive: 33

## Behaviour check list

Students first name: H      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating				1	
Enjoyment					1
Pleasure				1	
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry		1			
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions		1			
Reads aloud to the group		1			
Works independently					1
Daydreams	1				
Isn't sitting down properly			1		
Seems sad or depressed	1				
Try's to control peers Refuses to participate	1				
teacher's attention					1
Completes projects					1
Talks over teacher		1			
Talks over others		1			
Negative total score:	5	5	1	0	1
Positive total score:	0	2	2	3	3
	Not at all	not	A little	yes	Fully
Total:	5	7	2	3	4

Notes: **no reward**- Kept to their self's and did the task and waited for others to finish.

The task 13 minutes rounded to the minute

Total negative: 23. Total positive: 32

The sheets Below this are the pupils were in the group that  
lost the competition

Group B

Experiment 2



## Behaviour check list

Students first name: E      School: N/A

Date:28/02/2020      Year:4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating				1	
Enjoyment				1	
Pleasure			1		
Animated			1		
Becomes verbally aggressive when angry		1			
Becomes physically aggressive when angry	1				
Fights to resolve conflict			1		
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions				1	
Reads aloud to the group		1			
Works independently			1		
Daydreams	1				
Isn't sitting down properly				1	
Seems sad or depressed	1				
Try's to control peers Refuses to participate	1				
teacher's attention					1
Completes projects					1
Talks over teacher	1				
Talks over others			1		
Negative total score:	7	1	2	1	1
Positive total score:	0	1	4	4	1
	Not at all	not	A little	yes	Fully
Total:	7	2	6	5	2

Notes: **losing team** - went and put the puzzles on the floor and asked who wanted to do what puzzle, this was before the task started ( took control ) when 'E' finished their task they went and helped others that hadn't finished the task or where struggling to do the task. Student "E" was first to finish from there group and straight away went and helped student F that was struggling with the task..

The task took 10 minutes rounded to the minute

## Behaviour check list

Students first name: F      School: N/A

Date: 28/02/2020      Year: 4

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating			1		
cooperating			1		
Enjoyment		1			
Pleasure		1			
Animated		1			
Becomes verbally aggressive when angry			1		
Becomes physically aggressive when angry		1			
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive		1			
Participates in discussions			1		
Reads aloud to the group	1				
Works independently			1		
Daydreams				1	
Isn't sitting down properly			1		
Seems sad or depressed			1		
Try's to control peers Refuses to participate teacher's attention	1				
Completes projects			1		
Talks over teacher		1			
Talks over others		1			
Negative total score:	3	4	4	1	0
Positive total score:	1	4	5	0	0
	Not at all	not	A little	yes	Fully

Notes: **losing team** - found it hard. Said "I can't, I'm too stupid" (doubt) at this point I did have to step in and say no don't be daft your doing great. As soon as there class mates were done "F" asked if they could help them and the person that finished asked if they needed help. This worked out well and they both completed "F" puzzle.

The task took 13 minutes rounded to the minute

Total negative: 27 Total positive: 24

## Behaviour check list

Students first name: G      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating				1	
cooperating				1	
Enjoyment			1		
Pleasure			1		
Animated			1		
Becomes verbally aggressive when angry	1				
Becomes physically aggressive when angry	1				
Fights to resolve conflict			1		
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive			1		
Participates in discussions			1		
Reads aloud to the group			1		
Works independently			1		
Daydreams	1				
Isn't sitting down properly		1			
Seems sad or depressed	1				
Try's to control peers Refuses to participate teacher's attention			1		
Completes projects				1	
Talks over teacher			1		
Talks over others			1		
Negative total score:	6	1	4	1	0
Positive total score:	0	0	7	3	0
	Not at all	not	A little	yes	Fully

Notes: **losing team** - Talking to self but completed task and helped 'H' to finish the puzzle, took over a bit.

The task took 12 minutes rounded to the minute

Total negative: 24. Total positive: 33

## Behaviour check list

Students first name: H      School: N/A

Date: 28/02/2020      Year: 3

Observational behaviour	Not at all	not	A little	yes	Fully
Focus/on task/ concentrating			1		
cooperating				1	
Enjoyment			1		
Pleasure			1		
Animated			1		
Becomes verbally aggressive when angry			1		
Becomes physically aggressive when angry		1			
Fights to resolve conflict		1			
Asks to go to the toilet or other areas around the school to avoid the task.	1				
Sleeps	1				
Hyperactive		1			
Participates in discussions	1				
Reads aloud to the group	1				
Works independently		1			
Daydreams		1			
Isn't sitting down properly				1	
Seems sad or depressed		1			
Try's to control peers Refuses to participate teacher's attention	1				
Completes projects			1		
Talks over teacher			1		
Talks over others			1		
Negative total score:	3	4	4	1	
Positive total score:	2	2	5	1	
	Not at all	not	A little	yes	Fully

Notes: **losing team-** struggling, sat on floor and got help from "G" found it annoying because

'H' could do it just was taking more time for 'H' to do.

The task took 13 minutes rounded to the minute

Appendix C: Permission Slips

**PLYMOUTH MARJON UNIVERSITY**  
Plymouth Marjon University is a trading name of University of St Mark & St John



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Signed [redacted] ..... (Research participant)  
Print name [redacted] .....  
Date [redacted] .....

Name of person taking consent [redacted]  
Date [redacted]  
Signature [redacted]

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

Signed  (Research participant)  
Print name   
Date 

Name of person taking consent   
Date   
Signature 

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

**PLYMOUTH MARJON UNIVERSITY**  
Plymouth Marjon University is a trading name of University of St Mark & St John




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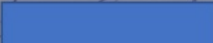

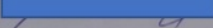
Signed [redacted] ..... (Research participant)  
Print name [redacted] .....  
Date [redacted] .....

Name of person taking consent [redacted]  
Date [redacted] .....  
Signature [redacted] .....

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.



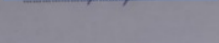
Signed  (Research participant)  
Print name   
Date 



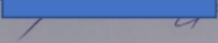
Name of person taking consent   
Date   
Signature 

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When completed: 1 for participant; 1 for researcher's file.



Signed  (Research participant)  
Print name   
Date 

Name of person taking consent   
Date   
Signature 

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

Signed \_\_\_\_\_ (Research participant)  
Print name \_\_\_\_\_  
Date \_\_\_\_\_




Name of person taking consent \_\_\_\_\_  
Date \_\_\_\_\_  
Signature \_\_\_\_\_




Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

**PLYMOUTH MARJON UNIVERSITY**  
Plymouth Marjon University is a trading name of University of St Mark & St John

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Signed  (Research participant)  
Print name   
Date 


Name of person taking consent   
Date   
Signature 


Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

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Signed  ..... (Research participant)  
Print name .....  
Date .....

Name of person taking consent  .....  
Date .....  
Signature .....

Please note: If you have any questions about your rights as a research participant, or wish to make a complaint, you can contact the University Research Ethics Panel at [ethicspanel@marjon.ac.uk](mailto:ethicspanel@marjon.ac.uk)

When completed: 1 for participant; 1 for researcher's file.

## Appendix D. Permission

You need to make clear that the questionnaires are anonymous. Please make sure that you check this form for grammar and punctuation errors eg 'its highly unluckily'

Please make amendments and get this checked by your supervisor.

Email from tutor dated 22 April 2020 05:36

Hi Toby

Do you mean ethical approval? Don't worry about this - we have an online record that your research met ethical approval, so it doesn't need to be included...