AVOIDANCE BEHAVIOUR IN A MATHEMATICS 10 CLASSROOM

by

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ABSTRACT

Motivation is the critical element in teaching and learning. Yet many students frequently appear amotivated and avoid doing mathematics. These students are often unsuccessful in mathematics which can have long-term negative effects on their academic careers. This research examines the behaviours and beliefs of four students displaying avoidance or non-start behaviour in a Mathematics 10 classroom. The purpose of the study is to discover the reasons underlying the avoidance behaviour. The method of narrative inquiry was used to create stories which could then be analyzed to interpret the participants' behaviours. Five theories of motivation were used in the analysis: cognitive-emotional, social-cognitive, social-emotional, self-determination theory, and amotivation. Analysis of the observations and narratives resulted in an incomplete picture when each of the discussed theories is used alone. Results suggest that a combination of theories is needed to study avoidance behaviour.

ACKNOWLEDGEMENTS

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INTRODUCTION

I have been a secondary mathematics teacher for six years. In this time I have taught a variety of mathematics courses at all levels and have encountered an amazingly diverse population of learners. They range from students who could go on to careers requiring high levels of mathematics to those who can not do basic arithmetic. The majority, however, lie somewhere in the middle and have been successful in mathematics by both their standards and mine.

While I find considerable joy in my students' successes I also suffer with their failures. Even though there are many more of the former than the latter, it is the students who are unsuccessful that consume the majority of my time and often frustrated efforts. I have spent countless hours trying to think of ways to help my struggling students. I offer extra tutorial assistance and encourage them to ask for help when it is needed. Though I would describe my classroom as mostly traditional, I try to plan lessons and activities that engage and interest students. Often my efforts and actions appear to have no bearing on the students' outcome. These experiences have led me to try and discover what separates those who struggle and succeed from those who struggle and fail. I believe that the biggest determinant of success in my classroom has been motivation.

It is not overly difficult to teach and help students who are motivated to do mathematics, regardless of the source or reason for the motivation. Whether it is intrinsic or extrinsic a student who possesses the motivation to come to class, to do their homework, study for tests, and ask questions is generally a relatively uncomplicated

student to teach. The student who asks questions is the one who gets the assistance needed.

Students who don't ask questions, don't do their work, or don't come to class are those who generally fall through the cracks and don't get the help they need. Students who display this type of non-start behaviour are the students most at risk. They don't attract that much attention, and while they may "get by" they usually don't do well and often fail. It is for this reason that I chose to investigate the behaviour of amotivated students in one semester of a Principles of Mathematics 10 course.

In Chapter 1 I define motivation and discuss five theories of motivation found in the literature. Three of the five are more general theories that have been in the literature for some time; the remaining two are more recent developments or expansions within one of the general theories. I also briefly discuss Brousseau's 'situation didactique' (1991). Chapter 2 consists of an explanation of the methodology used to conduct the research. Narrative inquiry is the method used to assimilate the observations and facilitate student feedback. Following the methodology, Chapter 3 details the story and subsequent analysis for each participant, after which the similarities and differences among the students are discussed in Chapter 4. Lastly, in Chapter 5, some conclusions are presented regarding the participants' beliefs in particular and motivation theories in general.

CHAPTER 1

WHAT IS MOTIVATION?

Motivation is the key to understanding student behaviour. A fundamental concept of motivation observed by Sigmund Freud is "at any moment, every person is perfectly motivated to be doing exactly what they are doing" (Dr. Ellen Domm, personal communication, February 5, 2009). If we can discover the motivation behind a student's actions or inactions, then it may be possible to influence motivation and therefore behaviour to create more positive outcomes. Equally and more important to investigate is amotivation, the absence of motivation. In exploring and attempting to explain these phenomena researchers have used a number of different approaches. There are researchers who focus on the nature of the task with which students are supposed to be engaged (Middleton, 1995), but the majority of current research investigates the nature of the individual student (Hannula, 2002, 2004, 2006; Dweck, 2000). Motivation, for the purposes of this study, is defined as "a potential to direct behaviour that is built into the system that controls emotion. This potential may be manifested in cognition, emotion, and/or behaviour" (Hannula, 2006, p.166). These three areas are the basis for the majority of research in this field. Some researchers choose to explore emotion/affect others believe in more of the social (behavioural) aspect, and some look at the cognitive aspect. Most theories combine two or even all three of these components.

Researchers have looked at motivation with a focus on intrinsic factors, extrinsic factors, or both. Intrinsic factors affecting motivation are student or trait-based. Extrinsic factors tend to refer to the task, classroom environment and overall state. It is becoming increasingly apparent that task and situational factors must be taken into

account when exploring motivation. The main focus of this study is on the intrinsic factors affecting motivation with the additional consideration of situational factors that could be at play.

Past research has relied on the idea that motivation is a stable trait and can be consciously accessed, explored, and explained. More recent research promotes the "acceptance of the importance of the unconscious in motivation and focusing on motivational states and processes rather than traits" (Hannula, 2006, p.166). It cannot be assumed that any individual has explicit knowledge of his or her goals and motivation, much less that he or she is capable of reflecting upon it and communicating it to others. Motivation cannot be directly observed but only identified as it appears in affect (emotions and behaviour) and cognition (as students explain their beliefs). Consequently, because of the difficulty students have in vocalizing their goals combined with the unconscious aspect, the primary method for studying motivation is through observation.

GOALS

Goals are not the same as motivation. Motivation has been defined above as the potential to direct behaviour, and this is structured through needs and goals. "Needs and goals are specified instances of the potential to direct behaviour" (Wæge, 2009, p.153). A person may have a goal of getting an 'A' in mathematics, but may not have the sufficient motivation to do the work and make the effort required to attain that goal.

Influences

Students' goals are influenced by three aspects: needs, beliefs, and emotions. Goals are directed towards specific objects whereas a need is more global. A student's different needs will determine different goals. Following this, his or her beliefs about the accessibility of that goal will also have an effect. Lastly, the emotions an individual experiences will influence goal choice (Hannula, 2002).

Needs

"There are necessary conditions for the growth and well-being of people's personalities and cognitive structures, just as there are for their physical development and functioning. These nutriments are referred to … as basic psychological needs" (Ryan and Deci, 2002, p.7). Researchers are aligned in their view that goals are derived from needs, but from this point theories diverge. There are those who believe that needs are innate and those who believe they are learned.

Researchers agree that there are three fundamental psychological needs influencing students within educational settings: autonomy, competency, and social belonging. The need for autonomy is sometimes confused with that of control or independence, but is interpreted here in the tradition of Deci and Ryan (2000) as the "organismic desire to self-organize experience and behaviour and to have activity be concordant with one's integrated sense of self" (p.231). Competency, or effectiveness, refers to the "propensity to have an effect on the environment as well as to attain valued outcomes within it" (p.231). Social belonging, or relatedness, concerns the desire to be loved and cared for, and to love and care for others (Deci and Ryan, 2000).

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Regardless of the differing methods through which these needs become satisfied, it remains necessary for students' well-being that they fulfilled. It should be noted that the strength of each need will vary depending on the individual and the current situation but that every person has a desire to have these needs met.

It is important to emphasize again the influence of individual factors and the situational aspect. "Different dominating needs lead to adoption of different primary goals and to different behaviours in mathematical situations" (Hannula, 2006, p.169). A student may have a dominant need for autonomy, but in a teamwork setting a social belonging need may take precedence. Unusually strong desires for one or another of these needs are not generally viewed as innate but as due to past experiences when these needs were thwarted (Ryan, 2000). For example, if a student experienced a lack of autonomy in a previous mathematics class he might have a strongly dominant need for control in the current mathematics class. These different needs are revealed through goal choice. In the aforementioned teamwork setting, the need for social belonging is manifested through interpersonal relationship goals.

Different needs can result in goals which coincide or conflict. A need for autonomy may result in a goal of being the leader in a group situation and pushing one's own agenda, which may conflict with a need for relatedness manifested in a goal of being liked and respected by one's peers.

Autonomy

Autonomy refers to a student's control over what they do. Ryan (2000) writes that the level of autonomy available within a classroom is dependent on the classroom environment and the teaching style embraced by the teacher. If a teacher has a more

traditional philosophy and prefers a more structured classroom students will generally find they have fewer choices in what or how they study and feel like they have less control. A teacher favouring a more student-centred approach generally offers higher levels of autonomy than a teacher-centred classroom. Not all students prefer more autonomy in a classroom situation as they may be used to, or prefer more direction from the teacher.

Competency

A student's level of ability (or self-perceived ability) with a task or area of learning is referred to as their level of competency. A person need not feel competent with every task or subject area and people will vary in what level of competence makes them happy. For example, a student who feels incompetent in Biology may focus on the fact that they have a high level of competence in English. Additionally, one student may be happy with being competent enough just to pass a course while another may not be satisfied with anything less than complete understanding.

Social belonging

The need for social belonging can refer to relationship with the teacher and/or peers. Some students feel the need to be socially accepted by their peers at all times. In a classroom situation this need may take precedence over a need for competence and the focus becomes on what others are thinking and on communicating with them rather than on the material. Other students may have a need for relatedness with the teacher and this can result in different behaviours. On one hand, they may try to please the teacher and be a likeable, model student. On the other, they may just try to get and keep the teacher's attention in whatever way possible. This could include behaviours like learned-

helplessness or acting out. A more structured, teacher-centred classroom gives less opportunity for peer interaction while a student-centred philosophy results in more opportunity for social interactions (Ryan, 2000). The increase in social interaction can help satisfy the need for social belonging.

<u>Beliefs</u>

Beliefs are defined as "multiply-encoded cognitive/affective configurations, usually including (but not limited to) prepositional encoding, to which the holder attributes some kind of *truth value*" (Goldin, 2002, p. 64). The key element that distinguishes beliefs from mere hypotheses, conjectures, or stories is the attribution of truth. It must also be noted that only the individual holding the belief needs to hold it true, others may not.

Beliefs about themselves as learners of mathematics, about mathematics and about learning in general influence students' goals. In particular, a student's beliefs must support his or her goals. A student will not adopt a goal if it is in contradiction to his beliefs. For example, a student with a belief that mathematics is useless and a good mark is unattainable will not set or hold a goal to succeed in mathematics. However, as noted by Österholm (2009) "a person can hold different beliefs that can seem to contradict each other, if these beliefs belong to different clusters" (p.65). Op't Eynde (2002) uses the example that a student may hold the belief that mathematics is a rule-based structure requiring primarily memorization but on the other hand may agree that doing mathematics can involve a lot of creativity and discovery. While these may seem to contradict, Op't Eynde writes that the former expressed belief could pertain to school mathematics while the latter refers to a belief about mathematics in society. Beliefs about

attainability, self-efficacy, and the usefulness of mathematics (in future studies, work, and life) have an effect on goal choice.

Beliefs are a very personal and complex entity. They are relatively stable and are positively reinforced or strengthened by affect (either positive affect or negative affect) (Goldin, 2002). For example, one who holds a belief that mathematics is hard and or useless will have that belief reinforced if he or she experiences difficulty and feels unsuccessful and discouraged during mathematics class. This reinforcement acts to make the student feel better. He or she may think "if mathematics is useless then it is okay if I am unsuccessful". In contrast, a student who feels that mathematics is useful and important will have that belief reinforced when he or she solves a problem or otherwise experiences success. It is very difficult to change beliefs because they are stable (McLeod, 1992). A student who holds a negative belief that they are bad at algebra will not change that belief with one successful algebra problem or algebra test. One such experience might serve to weaken the belief or introduce doubt but it would take a great number of positive experiences in mathematics to change the student's belief that they are poor in algebra. "Changes in beliefs and attitudes are generally achieved through the emotional dimension – repeated negative experiences will eventually produce negative beliefs and attitudes, and likewise, repeated positive experiences will produce positive beliefs and attitudes" (Liljedahl, 2005, p.222). Beliefs are therefore tied to emotions.

Emotions

Students have needs and goals, but these can be derailed by emotions. Emotions can serve to stabilize or de-stabilize beliefs. " 'Negative' feelings can both facilitate and

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impede problem solving" (Hannula, 2006, p.175). A student may have a need for competency and a goal of being successful in mathematics, but frustration and anger due to difficulty and failure can cause a change to or abandonment of the goal. Repeated failure may lead to a belief that the student can not do mathematics and the student may abandon the goal of being successful in mathematics and try to fulfill the need for competency elsewhere. According to Deci and Ryan (2000) "environments that block satisfaction of the needs for competence and relatedness tend to promote amotivation" (p.251) and Hannula (2002) states that "avoidance goals occur together with a belief of self as untalented in mathematics" (p.79).

Emotions are the most direct link to motivation but are only partially observable in body language and facial expression. Behaviour, however, "is always a dependable manifestation of motivation" (Hannula, 2007, p.167). This is further evidence to support the investigation of avoidance behaviour as an entry to understanding motivation.

Emotion is probably the most fundamental concept when we wish to discuss affect. However, researchers have not come to any final conclusion about what emotions are. They are agreed that emotions are connected to personal goals, involve physiological reactions, and are seen to be functional (have a role in coping and adaptation) (Hannula, 2004). The distinction between emotional reaction and non-emotional cognition should be noted. Hannula (2004) quotes Gerald Goldin as writing that "our emotional feelings and the complex structures involving them have *meanings*, even when we may not be consciously aware of those meanings, or able to articulate them" (p.109). He claims that information is encoded affectively and this can result in different reactions in different

situations. This supports the view that "emotional associations may function as an inertia force against change, even when change would be 'rational'" (Hannula, 2002, p.76).

Rationality is a key concept when considering emotion, and in particular with teenagers' emotions. The general belief is that faced with the facts and having possible consequences of a decision laid out a person will make a rational decision. But humans are not rational creatures. "In Freud's view, human beings are basically irrational and the unconscious mind is alogical. We are forever driven by irrational, practically uncontrollable unconscious instincts that are the ultimate cause of all activity" (Pervin and Oliver, 1997). We are too affected by emotion. Rational and irrational behaviours will be revisited later in Chapter 4.

One of the most debilitating emotions in regards to mathematics is anxiety. Anxiety can be rooted in beliefs that one is unable to do mathematics, or fear of negative opinions formed by others if one is unsuccessful. Anxiety is a much-studied topic in mathematics education and a full accounting of the research is not possible here.

Types and Orientations

Several researchers have discussed the nature and composition of goals. Their theories are for the most part similar, but some important variations are present. Dweck (2000) describes two types of orientations based on an overall beliefs framework resulting in two types of goal choices: mastery and performance. A mastery goal indicates the student has an intrinsic need to understand and "know" the material. On the other hand, a student with a performance goal is more concerned with the extrinsic factors involved. Somewhat in line with Dweck, Hannula (2002) theorizes that there are "three

motivational orientations; learning (or mastery) goals, performance (or self-enhancing) goals, and ego-defensive (avoidance) goals" (p.73). Hannula's learning (or task) orientation is similar to Dweck's learning goal orientation and, when combined, what Hannula calls performance and ego-defensive goals are akin to Dweck's performance orientation. Other researchers have categorized differently but the overriding theme is fairly consistent.

As mentioned earlier, goals can be general (global) or specific and different needs are manifested in different goals. Several goals can serve one need or one goal can serve multiple needs. For example, a goal of taking a leadership role during group work may serve both a need for autonomy and a need for social belonging. A need for competency could be served by a goal of doing well on a test, being able to answer a question in class, and being able to understand the current lesson.

Goals can coincide or contradict, be hierarchical or simultaneous. Depending on the nature of the student and the nature of the goal, a student may progress through goals serially, attaining one goal before progressing to the next. In the classroom however, goals are generally pursued in parallel. For example, a student is generally capable of pursuing a number of goals in parallel as simple as taking complete notes, making plans with a friend, finishing homework, and being able to answer a question posed by the teacher.

An example of coinciding and contradicting goals can be observed from the viewpoint of mastery and performance goals. In particular, Dweck (2000) has maintained that they need not be mutually exclusive goals. Holding a mastery goal does not exclude also having a performance goal. A student may hold a goal of understanding

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the material in class and being able to answer the questions on a test, but may also hold a performance goal of getting a higher mark than his or her peers and impressing the teacher. These goals coincide; they are realized by the same outcome and both serve the need for competency. However, a performance goal and a mastery goal may not coincide. A goal of performing well on a test may supersede a goal of understanding the material if the student is strapped for time. In that case, the student may decide to try to memorize all the material without understanding or try to cheat.

Beliefs about self-efficacy in this context are interpreted as beliefs about goal accessibility. "Personal goal setting is influenced by self-appraisal of capabilities" (Bandura, 1989, p. 730). An individual must feel that a goal is accessible (and attainable) to adopt that goal. A student will not adopt a goal such as finishing all the homework during class just because he knows he is able to achieve it. Neither is he likely to choose a goal he believes he will not be successful with, for example, getting a perfect score on his next test. Attainability is a necessary element of goal choice, but is not sufficient itself for adoption of a new goal. The student must also want to obtain the goal. A person may believe himself to be capable of running a marathon but that belief is not sufficient in itself to warrant the time and effort needed to pursue the goal. The effect of the final element, emotions, is to sometimes act as a barrier to goal achievement.

There is often a fine balance between alternative goals which highlights the importance of the situational aspect behind motivation. A change in the environment can affect a student's goal choice. This has great implications for future research on influencing students' goals. "The basic needs of autonomy, competence and social

belonging can all be met in a classroom that emphasises exploration, understanding and communication instead of rules, routines and rote learning" (Hannula, 2006, p. 176).

THEORIES OF MOTIVATION

In this section three theories and two sub-theories of motivation from a student-based standpoint are discussed. These theories all concentrate on the nature of the individual student but differ in what manifestation of motivation is the primary focus. As aforementioned, motivation is manifested in cognition, emotion, and/or behaviour. One single theory is not sufficient to describe motivation. As stated by Kloosterman (2002), "none of the theories has been adequately tested in the realm of mathematics learning and thus, when looking at motivational beliefs, it is appropriate to work from a variety of perspectives" (p.248). Five main theoretical frameworks can be found in the literature and will be discussed here. These theories of motivation are: cognitive-emotional, social-cognitive, social-emotional, self-determination theory, and amotivation. Self-determination theory is a more recent development and lies within the realm of social-emotional theories while amotivation is an even more recent expansion on one area of self-determination theory.

Cognitive-Emotional

"As a potential, motivation cannot be directly observed. It is observable only as it manifests itself in affect and cognition, for example as beliefs, values and emotional reactions" (Hannula, 2006, p.165). Beliefs are seen as most cognitive and most stable and emotions as least cognitive and least stable (Hannula, 2004). Therefore cognitive-

emotional theories consider a student's motivation to be primarily based on his beliefs about the task and himself (cognition) and the sadness or anger the student may feel if he fails at the task (emotion) (Hannula, 2006). Motivation is further explored in this framework through theories on self-regulated learning.

<u>Self-regulation</u>

Self-regulation refers to the management of one's own behaviour through choice of cognitive strategies, use of meta-cognitive knowledge and skills, and regulation of the self through choice of goals and resources (Hannula, 2007). It could also be thought of as students' choice of goals based on their own thoughts, feelings and actions. According to Boekaerts (1999), "Self-regulation means being able to develop knowledge, skills, and attitudes which can be transferred from one context to another and from learning situations in which this information has been acquired to a leisure and work context" (p.446). She also asserts that self-regulation is heavily influenced by perceived environmental cues.

In stating that individuals have a choice in cognitive strategies the role of consciousness is emphasized and that of the unconscious is de-emphasized. A factor in this conscious choice is students' beliefs about accessibility of different goals (self-efficacy) (Hannula, 2007). Often it is difficult for students to give voice to their beliefs and goals. In fact, contemporary cognitive science has shown that most of our thought is unconscious and operates below the level of cognitive awareness. Therefore we are unable to access it consciously and unable to focus on it due to the speed with which it

operates (Ekstrom, 2004). This statement is supported by some research that suggests most students are unaware of their learning style (Boekaerts, 1999).

The key aspect to self-regulated learning is choice. It is also context-dependent. One may be able to regulate learning in a drama class, but be unable to regulate it in science class. In addition, self-regulation can be separated into internal and external regulation. Internal regulation refers to students' ability to choose their own goals and not require instructions from others regarding strategic choices. External regulation is required for a student who cannot self-start and needs assistance from others to direct his or her learning (Boekaerts, 1999). A student with a high reliance on external regulation may be said to have a helpless orientation. One of the key elements of self-regulation is "students' involvement in and commitment to self-chosen goals" (Boekaerts, 1999, p.451). Knowing students' goals can provide "an indication of *why* students are prepared to do what they do and *why* they are or are not inclined to do what is expected of them" (Boekaerts, 1999, p.451). Again, if educators can understand the reasons why students exhibit certain behaviours then that is a giant step in the path to affecting change to those behaviours.

Self-awareness of their choices and knowledge about how to invest resources to reach a learning goal does not mean that students will be willing to invest those resources to regulate their learning. Reasons for this include feeling that too much time or effort is needed, or may be due to an unfulfilled psychological need (Boekaerts, 1999). For example, a student with a need for autonomy may not function well in a very directive, formal, learning environment.

In addition, Boekaerts cites that "Kuhl (1984) demonstrated that good intentions formulated in relation to a specific goal in the pre-decisional phase do not necessarily lead to goal striving and goal attainment, mainly because these intentions are not well protected from competing action tendencies" (1999, p.452). Thus even when a student has the intention of doing their homework or studying for a test, other more attractive goals may override (such as a goal of practicing a sport or connecting with friends, or even a goal of relaxation). Even when students have goals and good intentions attainment can be derailed because students are not particularly adept at determining how much effort will be needed to attain a certain goal (Boekaerts, 1999). Students often interpret high levels of effort as a sign of task difficulty. This is further discussed in reference to Dweck's social-cognitive theory of intelligence.

Social-Cognitive

Whereas a cognitive-emotional framework is based on beliefs and emotions, a social-cognitive framework focuses on beliefs and behaviours. Social cognitive theory is premised in the idea that people learn from observing others (social) and are also influenced through their own thought processes (cognitive). That learning is stronger and more likely to occur if the observer identifies with the model and if the individual has a good level of self-efficacy (Bandura, 1988).

<u>Self-efficacy</u>

Social cognitive theory is based on the premise that self-efficacy "strongly influences the choices people make, the effort they expend, and how long they persevere in the face of

challenge" (Pajares and Miller, 1994, p.193). Essentially this is the view that peoples'
beliefs about their capabilities, rather than their actual capabilities, will determine how
they behave. Pajares and Miller (1994) define self-efficacy as "a context-specific
assessment of competence to perform a specific task, a judgement of one's capabilities to
execute specific behaviour is specific situations" (p.194).

Anxiety

Anxiety is a pervasive issue in mathematics education and it has an effect in social
cognitive theory as well. Bandura (1986) asserts that people only fear events when they
cannot predict or exercise control over them. Levels of anxiety are determined by levels
of confidence, which is related to self-efficacy. Pajares and Miller (1994) report that
other researchers found that children with high levels of self-efficacy out-performed
children with low self-efficacy and also showed greater effort and persistence than their
counterparts.

Learner Orientation

Dweck (2000) looks at motivation from a social-cognitive perspective. She has a
widespread theory concerning the learning orientation of the child which stems from her
work on theories of intelligence. Dweck claims a person has one of two views towards
intelligence. One either believes that intelligence is a fixed entity or that it is incremental
and therefore more malleable. A person who holds an entity view of intelligence
generally believes that they have a certain amount of intelligence and that this amount is
fixed and they can do little to change it. On the other hand, if a person holds an

incremental view of intelligence they are more likely to believe that intelligence is not a fixed commodity and that their choices and actions can affect this quantity.

Based on the view of intelligence they hold people will have a distinct orientation towards learning and their goals will follow from this orientation. Those who hold an entity theory will tend to have a helpless orientation towards learning. These people will generally hold a performance goal. A student who holds a performance goal is concerned not only with looking smart to others, but also not looking dumb. He is more concerned with appearing competent than actually being competent. A person who believes that intelligence is malleable will likely have a mastery orientation towards learning. People with learning goals are more concerned with being competent and understanding material they encounter.

There are several differences between students with these seemingly opposing goals. They respond differently to challenges and failures, levels of effort required, critique, their environment (specifically the achievement levels of their peers), and have different levels of persistence. Levels of confidence also have different effects based on the theory of intelligence held by the student. The stability of these orientations is still under investigation (Dweck, 2000) and despite what one might think the goals are not mutually exclusive (Dweck, 2000).

Failure

When faced with failure, a student's response will be based on their theory of intelligence. Studies have shown that students who display a entity orientation tend to hold a fixed theory of intelligence.

"We used the term "helpless" to describe some students' view of failure – the view that once failure occurs, the situation is out of their control and nothing

can be done. We later extended the helpless response to include all the
reactions these students show when they meet failure: denigration of their
intelligence, plunging expectations, negative emotions, lower persistence, and
deteriorating performance." (Dweck, 2002, p.6)

A helpless orientation is a common phenomenon in a mathematics classroom and
can create great difficulty for the classroom teacher in terms of time and effort. The
helpless response is discussed further in a subsequent section. In contrast, students
who are mastery-oriented tend to have a more positive response to failure. These
students keep focused on achieving mastery despite current difficulties. In fact,
"mastery-oriented students welcomed the chance to confront and overcome
obstacles" (Dweck, 2002, p.10).

Effort

Knowing the theory of intelligence held by a student can predict that student's level
of effort. A student who believes that intelligence is fixed will also believe that a
high level of effort indicates that they have low intelligence (Dweck, 2002). An
increased level of effort makes a student with an entity view feel dumb. This is due
to the belief that if one is good at something, no effort is required. An additional
belief held is that effort is of little use if one doesn't have ability. An entity view of
intelligence is generally aligned with the belief that effort "allows you to use your
ability and realize your potential" (Dweck, 2002, p.39).

Higher-performing peers

When faced with higher-performing peers, student responses will differ based on their
theory of intelligence and subsequent goal orientation. An entity view of intelligence
produces a competitive atmosphere. Students with this view see their peers as

"competitors for self-esteem" (Dweck, 2002, p.130). In essence these students seem to believe that there is a limited amount of self-esteem available. If they are outperformed, or defeated, by someone else then they lose self-esteem. This is because they base their self-esteem on how they perform compared to everyone else. Contrarily, someone with a malleable view of intelligence does not feel a loss of self-esteem by being out-performed because their self-esteem is internal; it comes from their own efforts and abilities, not from comparison with others' performance.

Persistence

A student who has a performance goal is more likely to avoid challenges, fearing that they will not succeed. This type of student sees this as a failure. One who holds a fixed view of intelligence is very susceptible to feelings of inadequacy when they are faced with negative feedback. It is common to see students give up on a question they have been unsuccessfully trying to solve for only a few minutes. Conversely, if someone with a learning goal is unsuccessful it is more often seen as an opportunity for improvement and increased knowledge.

Confidence

Dweck's research refines the findings of Pajares and Miller mentioned earlier. Where Pajares and Miller (1994) found that peoples beliefs' about their capabilities will determine how they behave Dweck (2002) makes the distinction that when holding an entity theory of intelligence "students' confidence in their intelligence is good predictor of academic achievement only when they are not facing difficulties" and that even with an incremental theory of intelligence "confidence doesn't make much difference" (p.52). She concludes that "confidence seems unreliable within the entity framework and in

some ways unnecessary in the incremental framework". Nevertheless, it is admitted that having confidence must be better than not having it.

Studying student response to failure and higher-performing peers, and observing persistence and level of effort can serve to identify which orientation a student holds and therefore what beliefs they have about intelligence. One can see that these different views of intelligence can cause drastic differences in goals and behaviours in the classroom. Understanding students' goals and the reasons for them could eventually lead to methods for changing their orientations and effecting more positive behaviours and outcomes in the future.

Stability and exclusivity

These orientations and goals are fairly stable, but research has shown that they can be altered for short periods of time. Dweck (1999) has shown that if a student's theory of intelligence can be altered then the focus can be changed from a performance goal to a learning goal, at least for a period of time "Theories of intelligence cause students to focus on performance goals or learning goals … we can influence students' theories" (p. 24). The capacity for long-term change has not yet been determined but this has great implications for future research on motivation and goals.

As mentioned before, performance and mastery goals are not mutually exclusive. Research conducted by Hannula (2002) has shown that students can hold both types of goals simultaneously and that these goals are not necessarily contradictory. In one study he found that a student held both a performance goal (she wanted to be praised for her good performance) but also held a mastery goal because she really wanted to understand mathematics. In the same study another student was shown to have a performance goal

(she liked competition and showing that she was good at mathematics on tests) and also held a mastery goal (she undertook the challenge of more difficult problems even when her performance was not being observed). For both students each goal was determined by a different need and was influenced by the students' environmental context (Hannula, 2002).

Social-Emotional

Social emotional theories of learning and motivation take the view that too much credit is given to the cognitive or academic aspect of learning. Instead, the focus is on emotional intelligence. It is believed that social and emotional factors: awareness of one's own moods, the ability to manage one's moods, managing relationships, having empathy, and being able to self-motivate are more important than a purely academic education (Goleman, 1995).

Hannula's theories about motivation and engagement seem to have a basis in Dweck's work. Their work is similar in the social aspect but Dweck chooses to focus on cognition and beliefs whereas Hannula's theories are based in emotions. He believes there are three categories of socio-emotional orientations. These were mentioned earlier in this thesis using the terms learning goals, performance goals, and ego defensive goals. In later writings Hannula refers to these categories with different titles. These are: task-orientation, socially dependent orientation, and ego-defensive orientation. This is very similar to the two achievement orientations where task orientation is akin to a learning goal orientation, and socially dependent and ego-defensive orientations comprise the performance goal orientation as described by Dweck. In addition, Hannula highlights the

importance of the unconscious in motivation and advocates a focus on motivational states

and processes rather than traits (Hannula, 2006).

Based on their orientation, students will adopt different coping strategies when

faced with stressful situational demands. "Coping strategies refer to students'

interpretations and responses in a stressful situation where situational demands tax or

exceed the resources of the student" (Veermans & Järvelä, 2004, p.271). Both cognitive

and behavioural efforts may be made to manage these stresses and the response will also

account for context.

Task-Orientation

Students who have a task orientation are able to regulate their learning internally by

specifying their own learning goals. They do not need instructions from others to help

them choose a learning or problem-solving strategy (Boekaerts, 1999). A student who

has a task orientation is more focused on completing a task for its intrinsic value rather

than for any extrinsic contingencies and can be recognized by their persistent striving for

mastery. On initial presentation of a task they will recognise it as intelligible (Kaasila,

2005). They will experience curiosity, interest, or enthusiasm when faced with a

challenging task (Järvelä, 1998).

A student who is task-oriented will have a task-oriented coping strategy. The

main purpose is to master the task in order to learn. Their classroom behaviour will

indicate careful concentration on instructions and on the task itself (Veermans & Järvelä,

2004).

Socially-Dependent Orientation

This relates to the helpless orientation, or helpless response, discussed earlier in reference to Dweck's research. Social motives dominate student adaptation in a social-dependence orientation. "The student avoids independent effort and easily becomes helpless. Positive emotions are connected with expected satisfaction of the teacher" (Hannula, 2007, p.156). The student has a "submissive relationship with the teachers… [and] is not prepared to proceed independently through constructing task-requirements on the basis of given instructions" (Järvelä, 1998, p. 442). These students have high expectations of success, but they are related to receiving help from the teacher, not to self-contained task control (Kaasila, 2005).

A student who has a performance goal, or can be seen to have a socially dependent orientation will have a non-task oriented coping mode. Their purpose in coping is to gain approval and to comply with expectations. Observable behaviour might be a search for social approval, a request for detailed step by step instructions and positive feedback, social cues to perform the task, and acceptance (Veermans & Järvelä, 2004). If the first social coping strategies were successful even a slight obstacle will provoke the same strategy.

Ego-Defensive Orientation

A student with an ego-defensive orientation is dominated by self-defensive motives. "The student is sensitised to task difficulty cues, anticipating a negative response from the teacher, and may try to find compensatory tactics in order not to 'lose face'" (Hannula, 2007, p.156). "They are sensitized to situational factors which suggest threat

or risk" (Järvelä, 1998, p. 442). Another way to describe these students might be to say they have an avoidance orientation. "Students who are avoidance oriented produce atypical response shifts (i.e., they raise their goals after failure and lower them after success)" (Boekaerts, 1999, p.455). This can be seen in the student who fails a test and sets a goal of getting a high mark on the next test to balance it out – yet the likelihood of attainment is lower. Or conversely, the student who achieves a good mark and decides that they can lower their level of effort because they have a "buffer". When faced with a threat to their ego, students experience "anxiety, fear of failure and other conflict laden inhibitory emotional states…Novelties and ambiguities will not be interpreted as interesting…Instead, off-task behaviour interferes with the task-related activities" (Järvelä, 1998, p. 442). These students have low expectations for success (Kaasila, 2005).

Though it does not fit into either a socially-dependent orientation or an ego-defensive orientation, the coping strategy of a student with a work-avoidance goal is also non-task oriented. Their purpose in employing a coping strategy is to reduce emotional tension or conflict. Observable behaviour could be negative verbal and non-verbal emotional responses, avoidance behaviour, or substitute activities. The main purpose for students with this orientation is to avoid the task, effort, or situation. This tendency may be manifested as a passive, indifferent, or aversive attitude towards learning (Veermans & Järvelä, 2004).

Self-Determination Theory

Self-determination theory falls under the umbrella of social-emotional theories because it focuses on the motives that are behind students' behaviours and the contexts that provoke them (Deci & Ryan, 2000). Though it is a subcategory it has been sufficiently developed to warrant treatment as a separate theory.

> "Self-determination theory [SDT] has differentiated the concept of goal-directed behaviour, yet it has taken a very different approach. SDT differentiates the *content* of goals or outcomes and the *regulatory processes* through which the outcomes are pursued, making predictions for different contents and for different processes. Further, it uses the concept of *innate psychological needs* as the basis for integrating the differentiations of goal contents and regulatory processes and the predictions that resulted from those differentiations." (Deci & Ryan, 2000, p.227)

SDT is focused on explaining the 'what' and 'why' of goal pursuits. It is based on three main ideas or assumptions (Deci & Ryan, 2000). First that humans have an innate tendency to integrate; that is to "forge interconnections among aspects of one owns psyches as well as with other individuals and groups in one's social world" (Wæge, 2009, in press). The second assumption is that "social-contextual factors may facilitate and enable the integration tendency, or they may undermine [it]" (Wæge, 2009, in press). Third, "the three basic needs [autonomy, social belonging, and competency] provide the basis to categorizing social-contextual factors as supportive versus antagonistic to the integrative process" (Deci & Ryan, 2000).

Types of Motivation

In their theory, Deci and Ryan (2000) look at motivation along a continuum from intrinsic motivation to extrinsic motivation to amotivation. This continuum is characterised by an increase in the level of autonomy and an increase in internalization of regulations from amotivation to intrinsic motivation. The continuum is not a progression; a student does not need to move through introjected and identified regulation to arrive at integrated regulation.

Behaviour	Nonself-determined					Self-determined
Type of Motivation	Amotivation	Extrinsic Motivation				Intrinsic Motivation
Type of Regulation	Non-regulation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation
Locus of Causality	Impersonal	External	Somewhat External	Somewhat Internal	Internal	Internal

Figure 1. The self-determination continuum, showing the motivational, self-regulatory, and perceived locus of causality bases of behaviours that vary in the degree to which they are self-determined (Ryan & Deci, 2000, p.237).

"*Intrinsically motivated behaviours* were defined as those that are not energized by physiological drives or their derivatives and for which the reward is the satisfaction associated with the activity itself. Intrinsic motivation thus represents engagement in an activity for its own sake. *Extrinsically motivated behaviour* is defined as engaging in an activity to obtain an outcome that is separable form the activity itself." (Deci, 2006, p.20)

Researchers have studied the effects of intrinsic and extrinsic goal framing and the related results with regards to level of engagement with a task, level of conceptual

learning, and persistence (Deci, 2006). The most positive results come when behaviour is intrinsically motivated and when intrinsic goal framing is utilized. "Students' motivation will be maximized within social contexts that provide the students the opportunity to satisfy their basic psychological needs for competence, autonomy and relatedness" (Deci & Ryan, 2002). There are different levels and types of extrinsic motivation based on the source of regulation and the perceived locus of causality. "If people perceive themselves as the origin of the behaviour, they have an internal perceived locus of causality. If people believe they are engaging in behaviour to achieve rewards, or because of external constraints they have an external locus of causality" (Wæge, 2009, in press). Regulation is interpreted by Wæge to be "what regulates, orients or determines behaviour, or in other words, what causes behaviour" (2009, in press).

Types of Regulation

As can be seen in Figure 1 above, there are six types of regulation. Non-regulation is aligned with amotivation. External, introjected, identified, and integrated regulation all fall under the category of extrinsic motivation and intrinsic regulation is associated with intrinsic motivation. These six types of regulation are differentiated by the type of motivation and locus of causality.

Amotivation is neither intrinsic nor extrinsic. "Amotivation is a state in which people lack the intention to behave, and thus lack motivation…people are likely to be amotivated when they lack either a sense of efficacy or a sense of control with respect to a desired outcome" (Deci & Ryan, 2000, p.237). Amotivation represents a lack of both intrinsic motivation and extrinsic motivation and therefore a lack of self-determination. It

occurs when people do not value an activity or the outcomes it offers, or when they do not feel competent to do it. This has important implications for the study of avoidance behaviour and will be discussed further in a subsequent section.

The least autonomous form of extrinsic motivation is termed external regulation (Deci & Ryan, 2000). External regulation refers to behaviour prompted by external rewards or punishments without any internalization of reason for the behaviour. An example of behaviour that is externally regulated is when a student completes his homework solely to avoid being grounded or because he is allowed to play video games once it is done.

A student who engages in an activity because he feels internal pressure (guilt, shame, ego, or self-worth) is displaying introjected regulation. (Deci, 2006) The key difference here is that there is some internalization of the regulations but they are not assimilated to the self therefore the resulting behaviours cannot be called self-determined (Deci & Ryan, 2000). To use the previous scenario, the student completes his homework but not for external reward or punishment, but because he feels guilt and or shame if he goes to school with it incomplete but does not see any other importance in its completion.

If an individual identifies with the value of an activity they take on the regulation of the activity as one's own. This is called identified regulation and differs from introjected regulation in that they see the value of the behaviour and therefore have more internalized it. An example of this might be a student who does his mathematics homework because he wants to get a good mark in the class so that he can achieve his goal of getting into a good university. This is closer to intrinsic motivation because it is

volitional, but the nature is still extrinsic because the student is not doing the homework for its own importance.

The most autonomous form of extrinsic motivation is termed 'integration'. This is the nearest possible state to intrinsic motivation while still being extrinsically motivated. Integration "involves identifying with the importance of behaviours but also integrating those identifications with other aspects of the self" (Deci & Ryan, 2000, p.236). The key difference between integration and identification is that the regulations are more fully internalized and aligned with other values. The student completes his homework because he sees the value in doing it to get a good mark on the test and in the class. In the previous example the student did the homework for the marks he wanted from it, in this case the student does it because he understands the need to practice to do well on the test. This is not yet intrinsic because while the student sees the value in the homework he is doing it primarily because it will get him to things he values more.

The student who is intrinsically motivated to do his homework does so because he appreciates its value and because he gets some sort of internal satisfaction from doing so. He wants to do it.

Wæge (2009) notes that an individual does not need to go through each stage of the continuum. A new regulation of the behaviour may be internalized at any stage on the continuum.

Goal Internalization and Needs

According to self-determination theory the level of goal internalization is a determinant of the type of regulation under which the student operates. This in turn indicates the

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nature of the student's motivation. The needs for competency, autonomy, and relatedness are important for internalization. Ryan and Deci (2000) argue autonomous regulation involves greater need satisfaction. Thus intrinsic motivation and integrated extrinsic motivation have been shown to result in more positive behaviours, optimal engagement, and psychological well-being. When needs are not satisfied (such as the need for autonomy) people will adopt compensatory processes.

> "People's inherent tendency toward activity and organization will lead to protective responses … people develop substitute motives, nonautonomous regulatory styles, and rigid behaviour patterns that serve to protect them from the threat and preserve as much satisfaction as seems possible in the non-supportive situations." (Deci & Ryan, 2000, p.249)

Once a need substitute is developed it can interfere with attainment of the original need because people tend to keep focused on the need substitute leading to negative consequences. An example of this could be a student who has a need for competency but has difficulty understanding the material. That student could then develop a substitute need, not for understanding, but for performance. Lack of understanding of one area makes it more difficult to understand another and the substitute need for performance could lead to cheating. Or, an inability to understand the material and do well could result in a substitute need for autonomy and the student may feel it necessary to defy the teacher and act out in class. Need-thwarting can also lead to development of strict behaviour patterns that help protect people from inner pain resulting from unattained needs. These behaviour patterns tend to keep people from dealing with their inner pain and can be applied to situations when they are not needed. In conclusion, the thwarting of basic needs for competence, autonomy, and relatedness can lead to people becoming

amotivated which in turn results in negative consequences. According to Green-Demers, Legualt, Pelletier, and Pelletier "amotivation has been correlated with boredom and poor concentration in class, higher perceived school-related stress, poor psychological adjustment to university, and high school dropout" (2008, p.864).

Amotivation

Motivation, the reasons for it and the factors influencing it, is a past and present area of considerable interest to researchers. Theories of motivation are plentiful and have been introduced, developed, and refined for decades. Theories of amotivation are much less prevalent and have only appeared as a separate topic of research recently. It is an important area of research as the consequences of amotivation can be very serious. In many cases amotivation can lead to withdrawal from academic activities and eventually dropping out of school (Green-Demers et al., 2006). Recent studies have explored amotivation and divided it into four subsets. These four subsets, or reasons, for amotivation are: ability beliefs, effort beliefs, academic values, and characteristics of school tasks (Green-Demers et al., 2008).   The researchers add to the definition that "amotivation (the absence of motivation) demarcates the class of behaviours that are executed for reasons unknown or not executed at all" (Green-Demers et al., 2006, p.568). They also claim that amotivated individuals are unable to predict the consequences of their behaviour and cannot see the motive behind it. The goal of their research was initially to show that these four types of motivational deficits were sufficient to categorize academic amotivation.

<u>Ability Beliefs</u>

Amotivation is said to be due to deficient ability beliefs "when students attribute their academic difficulties to low perceived competence, when they hold low self-efficacy expectancies about schoolwork, and when their academic ability self concept is poor or ill defined" (Green-Demers et al., 2008, p.865). A student who believes that he is not competent in mathematics may believe that failure will be the eventual outcome. If failure is seen as unavoidable then the student would see no reason to try. A belief that failure will be the result could lead to academic detachment and in more extreme cases, dropping out of school (Green-Demers et al., 2006).

<u>Effort Beliefs</u>

When a student lacks the desire or ability to make the effort required for academic work that student is said to have deficient effort beliefs. A student may know what is required of them in terms of effort and believe that they are able to fulfill these academic requirements but also believe that they are unable to begin or sustain the effort necessary. A student may think "I know I am capable of learning this material but it is going to take too much effort and I don't want to do it". The student may even describe themselves as lazy. This deficiency in effort beliefs is a cause for amotivation.

<u>Academic Values</u>

If a student does not value school or academics then he or she will have little reason for doing schoolwork or other necessary academic behaviours. A devaluation of academics is another reason for amotivation. Academic values are most strongly influenced by

parents than by teachers or friends (Green-Demers et al, 2006). If either parent or both parents hold a low valuation of academics or if a parent tells the child that it is okay to do poorly, perhaps because the parent had difficulties as well, then the child may adopt those beliefs. If the belief exists that there is no need to be successful then there may be no motivation to try.

Characteristics of School Tasks

Lastly, the unappealing characteristics of some school tasks make it difficult for many students to engage with them. Tasks perceived as boring or tedious may encourage disengagement and factor into amotivation. This is an especially important subset to consider as mathematics is often thought to be prone to boring and tedious assignments and teaching techniques.

Amotivation can lead to some very serious consequences for students. In the short term, disengagement or amotivation can result in a student having difficulty understanding the current material, and then, because so much of mathematics builds on prior knowledge, the student will have difficulty with future material. This snowball effect could eventually lead to the student failing the class. If this behaviour occurs in other classes, more failures result, and eventually this could lead to the student dropping out of school.

> "Problem behaviours, for instance, were predicted by a combination
> of amotivation due to a lack of values, unappealing task characteristics, and
> low-effort beliefs. Several facets of motivational deficits thus appear to play
> a role in the occurrence of academic misconduct. Also, intention to drop out
> was predicted jointly by low-ability beliefs and lack of academic values."
> (Green-Demers et al, 2006, p. 577).

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Amotivation is primarily detectable through observable behaviours. The type of behaviour that often signifies amotivation is substitute behaviour, also known as off-task behaviour. According to Hofer (2007) "all activities not directed toward learning can be viewed as off-task behavior" and "pupils disengage from activities related to learning" (p. 28). A more specific definition is given by Roberts (2001) where off-task behaviour is described as "students who are inattentive, distractible and/or fail to complete assignments". Possible causes or purposes for off-task (or avoidance) behaviour are: "gaining adult or peer attention or access to more preferred activities, such as talking with peers or playing with materials; …escaping or avoiding undesirable activities…frequently, inappropriate behaviors will serve multiple functions" (Roberts, 2001).

Through identifying the different types of substituting behaviours exhibited by students I have created three categories: behaviours that are legitimate, those that seem legitimate, and those that are illegitimate. The nature of a substitute behaviour can depend on the frequency with which it appears, whether it is an otherwise accepted classroom activity and its degree of relatedness to the assigned task

A legitimate substitute activity might be a task that is a prerequisite to the assigned task, such as sharpening a pencil, finding paper, reviewing the notes, getting a textbook, or getting to the right page in the textbook. Each of these activities is a perfectly valid substitute activity on its own, but when students apply these substitutes with frequency on a regular basis then they become illegitimate or delaying tasks. Other types of legitimate activities might be an appointment at the counsellor's office, a trip to

the bathroom, or a question for the teacher on some other topic possibly unrelated to the task. Again, if these activities occur repeatedly then they become illegitimate.

An activity that seems legitimate could be something like doing other classwork or studying for a test for another class. They seem legitimate because the student is working (just not on the assigned task) but these activities should be done at another time. The reason for doing them in mathematics class could be poor planning on the student's part, perhaps they substituted other activities for studying the night before or underestimated the time they would need. Other seems-legitimate behaviours could be organizing a notebook, rewriting the notes, or asking a neighbour for help. Asking a neighbour for help is included as a seems-legitimate behaviour because it is a frequent excuse for talking to friends during class and the topic is often not related to the task at hand. Students will occasionally seem to roam aimlessly in the classroom claiming to be going to check their mark or asking a question of a peer who is on the other side of the room.

Illegitimate, or invalid, substitute activities abound and include such things as staring out the window, chatting with friends, texting to friends, doodling, reading a novel or the paper, listening to music, playing cards, playing a video game, doing a crossword, making paper airplanes, or any of a great number of off-task activities.

All of these behaviours can signify amotivation and all are counter-productive to completing the task at hand. A topic of past and current research is determining how to reduce the amount of substitute or off-task behaviour in the classroom.

CHANGING OR INFLUENCING MOTIVATION

Motivation, as discussed previously, is a balance between the individual's beliefs and the situational environment. To influence a student's mathematical goals one must understand his or her beliefs about mathematics (as an environment) and understand the student's beliefs about his or her mathematical self (needs) (Hannula, 2006). Research has shown that motivation can be influenced through a change in student beliefs (Dweck, 2002). Students with an ego-defensive orientation have been shown to change towards a social-dependence orientation and a related study reported a shift from ego-defensive goals to a performance goal (Hannula, 2007). Students have also been shown to change from a goal of instrumental understanding to one of relational understanding (Wæge, 2009). These changes were effected through facilitating different experiences in learning mathematics and through reflection on these experiences. Collaboration with a partner or tutor was also a factor in the shift.

"For a change in motivation to take place there must be a desired goal and one's beliefs (including efficacy beliefs) must support the change" (Hannula, 2007, p.170). Therefore before there can be any change in motivation researchers and educators must first effect a change in a student's beliefs about their own competence and ability to succeed with a mathematical task or mathematics in general.

THE DIDACTICAL CONTRACT

In addition to understanding students self-efficacy beliefs it is important to understand students' expectations of themselves and of the teacher in the classroom. This falls under the category of what Guy Brousseau defines as a 'situation didactique' that "consists of

the learners, the teacher, the mathematical content, and the classroom ethos, as well as the social and institutional forces" (1991). Related to this is the concept of the didactic contract, an often tacit agreement between teacher and student. In most situations to uphold the contract the teacher is required to teach the material and supply extra assistance if needed and the student is required to learn the material, do the required work, and pass the assessments (Shinkfield, 2007). The precise nature of the contract varies depending on the individual teacher and student. For example, in Brousseau and Warfield's "The Case of Gaël" the story is told of Gaël's interpretation of the didactic contract.

> "His part of it was never to risk failure by actually trying to understand the mathematics, but always to maintain his equanimity and his acquiescence; the adult's part was to refrain from chastising him or rendering him uncomfortable, and to supply the answers to the questions she herself had posed." (Warfield, 2006, p.30)

The most interesting part arises when one of the parties (student or teacher) feels their version of the contract has been broken. A student who maintains a contract similar to Gaël's may feel the teacher is breaking the contract if the teacher somehow makes them uncomfortable or does not supply the answers to a question. A common theme in many students' contracts is that if they wait long enough the teacher will supply the answer. When a teacher does not and requires the student to figure it out alone the student may feel that the teacher is not upholding his or her part of the contract. Students who feel as Gaël did, that if they are agreeable, quiet, and polite then the teacher should just let them be, will feel the teacher is breaking the contract by pressuring them to do more. Teachers who believe that students should be active participants in their own

learning and not passive receivers of knowledge will feel the student is breaking the contract by not engaging with the task at hand. Once one party feels the contract is broken reactions can vary. A teacher may pressure the student to participate more and the student may react by withdrawing further and becoming disagreeable, or not coming to class at all. Another possible reaction, depending on the student and the teacher, is that the student will renegotiate the contract and become more active in the learning process.

Understanding a student's interpretation of the established contract, whether it is conscious or unconscious, is a key element to understanding student behaviour.

WHERE DOES THAT LEAVE US?

One common theme in all current research on motivation and goals is that all of the participants in all of the studies seem to have an abundance of goals. One problem I have found in my classroom is that there are some students who seem to have no goals with respect to mathematics. What does one do to motivate or encourage a student to do mathematics when they seem to have no goals with regards to the subject? These students must have goals; they just aren't goals which will result in academic success. So what types of goals do these students hold and why do they choose them? Is the choice conscious, unconscious, or both? The majority of research also assumes that all students have some sort of motivation. Only a very few theories explore the possibility that a student might have no motivation, or be amotivated. Amotivation can be determined through observation. The student who sits and doodles throughout the lesson and the homework time is not on-task but not because he is afraid to show incompetence or because he is trying to impress his peers. Or the student who is not motivated but

punishment or reward to do his homework or study, and cannot be motivated to do so, but again has no emotional reaction nor does he hold a belief that it is completely unimportant. Both of these students exhibit behaviours that point towards amotivation. Another common factor to be expected is that the students are clearly demonstrating that they are neither mastery oriented (Dweck, 2000) nor task oriented (Hannula, 2006). The student whose behaviour cannot be explained by any other theory is likely amotivated. The seeming lack of goals, lack of motivation, and non-task or non-mastery orientation is exemplified in avoidance behaviour.

Students who don't begin to take notes or try the homework are displaying what is called non-start behaviour. Those who begin but quickly abandon the task due to difficulty, lack of interest, or the lure of substitute activities are displaying early-stop behaviour. These are the more specific definitions of non-start and early-stop behaviour. An extreme example of non-start behaviour is the student who avoids coming to class to begin with. This example uses a more global definition of non-start behaviour; one that is more synonymous with avoidance behaviour. The student who will not ask questions even when he or she knows they can't do a task is displaying avoidance behaviour as is the student who starts their homework but is consistently distracted or is delaying moving forward. So even though they are technically starting, this behaviour still falls under the more global definition of non-start behaviour. Avoidance behaviour will be used as an umbrella term under which fall non-start, delayed start, and early stop behaviour.

All of the aforementioned research contains valuable information for researchers. My belief is that there is not one particular theory which adequately explains all facets of motivation and its associated behaviours therefore I have chosen to pick and choose the

pieces I find most pertinent to my research and to use those theories to analyze the data I collected on my participants. Current recommendations for research support this choice (Hannula, 2005). Students' comments and observable behaviours can be used to help identify their needs and goals. "Because "students' motivation cannot directly be observed, and thus measured, it needs to be reconstructed through interpretation of the observable" (Wæge, 2009, p.154).

There are a significant number of factors that lead to avoidance behaviour. Once the avoidance behaviour is observed the difficulty is in identifying which factor or factors are leading to it. How can we go back and identify the appropriate cause for the observable behaviour?

CHAPTER 2 – METHODOLOGY

Amotivation, like motivation, is not observable. The only way it can be identified is through observing behaviour. As discussed in chapter 1, non-start behaviour and early stop behaviour are two indicators of amotivation. Non-start behaviour is exhibited by a student who is not doing an assigned task. Early stop behaviour is identified by a student who begins a task but quickly gives up and stops working on the assigned task. Again, both of these fall under the more general term of avoidance behaviour. Since amotivation can not be observed directly, but the indicators of it can, it is necessary to look for avoidance behaviours in order to find students who are amotivated. To discover and investigate the behaviours of amotivated students, the method of narrative inquiry was used. Within this chapter this method will be discussed and an explanation will be given for the particular way narrative inquiry was used in this research. Following that is a description of the participants and the classroom environment.

WHY AVOIDANCE BEHAVIOUR?

Avoidance behaviour does not have to be consistent throughout different tasks. A student who displays non-start behaviour when it is time to work on the assignment may not display the same behaviour during the lesson and may be quite good at taking notes and being attentive. The behaviour is also not necessarily consistent from day to day – a student may exhibit non-start behaviour one day and not the next. The inconsistency and possible consequences of such behaviour led me to want to investigate it, learn more about it and in the future possibly how to change it. In the process of my research I

wanted to discover "What factors influence non-start or early stop behaviour? What reasons do students give for avoiding the task at hand? What activities, if any, do they substitute for what they have been instructed to do? What rationale do they give when they are called on their behaviour?"

NARRATIVE INQUIRY - BACKGROUND

"According to Bruner, people organize and manage their knowledge of the world in two broad ways: paradigmatic (logical-scientific) and narrative modes of thought. The first seems appropriate for treating physical 'things', the second for treating people and their lives. The aim of narrative knowing is to understand actual human conduct (Bruner 1986)" (Kaasila, 2007b, p.205). Therefore the method I chose to investigate the phenomenon of non-start and early stop behaviour was narrative inquiry. I chose narrative inquiry because it has potential benefits for both the gathering and representation of data. These benefits will be explained later in this section. Narrative inquiry is a method of research that is both accepted and being increasingly more utilised among educational researchers. It is a method that involves telling a story, a practice that is almost as old as man himself.

> "Narrative accounts construct and reconstruct stories of school experiences in order to make meaning of them." (McSheffrey, 1992, p.1)

Within this thesis I will use the terms narrative and story interchangeably. Telling a story is first nature to humans. From early on children engage in the storytelling process. Research has shown that children tell more complex stories to themselves before engaging in a similar level of storytelling with others (Egan, 1986). For

centuries before and after the appearance of the written word history was passed down in storied form. Narrative has been used for many other purposes as well. It has been used to help develop morals and to warn children of possible dangers through fairy tales such as those written by Hans Christian Anderson. Telling stories is a way to pass on knowledge and tends to be one of the best forms in which to present information for high retainment. Before a young child learns to read, often they can "read along" in a book because they remember the story. Presenters often use story as a hook to gain an audience's attention. As humans we are inherently drawn to storytelling. "Narrating is much more than describing events or actions; it also means relating events and actions, organizing them into sequences or plots, and then attaching them to a character." (Kaasila, 2007b, p.206)

Story is appropriate because it can be all encompassing. A story can describe the whole picture. It is impossible to focus on only one aspect of a situation and be able to extrapolate from there. The identity of a student in the classroom is not who they are outside the classroom – there are other factors to consider. Therefore it would be irresponsible to use only my classroom observations and documents to describe students' behaviour and analyze it. There are so many factors in a student's life outside the classroom that affect his or her behaviour within the classroom that more information is needed. Observation can only describe the behaviour but cannot begin to analyze the reasons for it. Similarly, student interviews can be used as a method of inquiry to delve into the reasons for behaviour, but the reasons may not be conscious to the interviewee, or the interviewee may not be capable of explaining them. Narrative inquiry is the vehicle

that can help to get the "bigger picture". In asking a student to tell a story, pressure

is removed. In order to tell a student's story, it must first be told to the researcher

by the student; whether orally or in writing. A story does not have to be

chronological; areas of interest can be revisited and the order of presentation is not

as critical as a piece of writing such as an essay. It may also take some emotional

pressure off the student. In writing the student's story and having the student read

and discuss the accuracy and content of the narrative with the researcher, even more

pressure is removed from the student as they need only validate or invalidate the

writing, rather than produce it. I thought that students would be able to

communicate and provide more useful information through the narrative inquiry

method, although this was not the case.

Narrative inquiry is an iterative process. It requires collaboration and numerous

tellings and retellings of a story. The researcher and participant work together to create a

narrative which is authentic and meaningful to both the individuals and the intended

audience. This process in itself affects the narrative because it is also a process of

discussion and reflection.

> "Both researchers and practitioners are participants in the research and, as
> such, engage in the collaborative process. Both work through a mutual
> reconstruction of the telling of the story in practice that has been captured in
> field notes, transcripts and documents. The narrative inquiry process is a
> process of data collection, mutual narrative interpretation by practitioners and
> researcher, more data collection and further narrative reconstruction. The
> narrative inquiry process itself is a narrative one of storying, restorying and
> restorying again." (Clandinin, 1992, p.128)

The result of this process is a more detailed picture of the experience than could be

obtained otherwise. The reflective aspect is critical both on the part of the researcher and

participant. The process by its nature encourages reflection and this benefits both parties.

The participant reflects on the experience, perhaps learning more about him or her self

and the researcher also reflects on the process and their teaching methods. An example

of where narrative inquiry could be used is to explore students' beliefs about the utility of

mathematics. From observations of student behaviour and informal conversation a

researcher could write a draft narrative describing a student's beliefs about how and why

mathematics might be useful to the student. This narrative is then given or read to the

student and the student is asked to provide feedback. By working together the researcher

is able to get the information they need about the student's beliefs, but also has some

assurance of its validity due to the involvement of the participant throughout the process

rather than just at the initial data gathering stage. The student has the ability to give more

detail in certain areas and can also tell the researcher if something in the narrative is

incorrect. In this way, a richer, more accurate narrative is created. This is the benefit of

narrative inquiry with respect to the representation of the data. Using story to represent

the data makes it more engaging, informative, and enjoyable for the reader.

Historically the requirements of research using narrative inquiry have been

reliability, validity, and generalizability (Connelly & Clandinin, 1990). However,

generalizability has been rejected by some researchers and instead replaced by the term

"transferability". (1990, p.7) While it may seem to have a similar meaning, the term

transferability implies that specific characteristics can be seen in one case and transferred

to another whereas generalizeability tends to imply a glossing over and a loss of

specificity. As Connelly and Clandinin point out, the terminology and language for narrative inquiry are still under development and therefore each researcher is responsible for choosing and defending the criteria that best apply to his or her work (1990). Therefore it is the choice of the researcher, my choice, as to which criteria and what language I choose to use in my process of narrative inquiry, as long as it is defensible.

Another criterion noted as necessary for a good narrative is that it should be inviting. The narrative should encourage the reader to be a participant and to make connections to his or her own teaching and experience. At the same time, the narrative should give new information or ideas and encourage the reader to reflect. For this reflection to occur the narrative must be plausible (Connelly and Clandinin, 1990).

It should be noted again at this point that the terms "story" and "narrative" are interchangeably throughout this work following the practice of Clandinin and Connelly. That is, the two terms are treated as equivalent, although generally story will be used in the process of data collection and narrative would be used when referring to research and method. For example, I might use the term story when discussing the initial document a student wrote that in response to my questions or one that describes his experiences in the mathematics class but after discussion, retelling, and reworking the document written by me I would describe it as a narrative.

Dewey's works (as discussed by Clandinin and Connelly) are consistent in arguing that education, experience, and life are inextricably intertwined (1996). In carrying this theme the study of education must therefore be the study of experience and thus the study of life. One may note that while one's job is not who they are as a person,

it is certainly inseparable from their definition as a person. The counterargument might be that a job is something one does, not who one is. However I argue that whether a doctor, a teacher, a carpenter, or a clerk, an occupation has an influence on most facets of life and therefore is inseparable from one's identity. As stated earlier, a student is not just who they are in the mathematics classroom but must be looked at in the larger view as who they are in any classroom, with their friends, with their peers, outside of school and in the home with their family. All of these contribute to the identity of a person and affect how they react and behave in various situations. There is a body of work dedicated to the study of identity but that is beyond the scope of this particular research study. However, it is due to this vast definition of identity that the process of narrative inquiry is so useful. The oral and sometimes written input of the participant in the researcher's writing and rewriting of the narrative is essential to obtaining the background and further details needed to make sense of the bigger picture and in this particular case to investigate and describe the reasons for non-start and early stop behaviour. This overall identity cannot be sectioned off and left at the classroom door as they enter, only to be reclaimed at the finishing bell. This supports the view of looking at the entirety rather than focussing on the distinct or separate pieces.

Using authorized biographies is an accepted and validated method of obtaining and verifying student beliefs, motivation, and behaviour in regards to mathematics. Several researchers have used this technique (Clandinin & Connelly,1990; Kaasila, 2007b; McFeetors, 2004). Other data collection tools include field notes, participant and researcher observations, journal records, interview transcripts (unstructured or structured), others's observations, story telling, letter writing, autobiographical writing,

biographical writing, documents such as class plans and newsletters, and writing such as

rules [the rules that people write for others to follow], principles, pictures, metaphors, and

personal philosophies (Clandinin, 1990). Questionnaires could also be included although

it should be noted that while the data obtained may be more direct it is often less

descriptive. Observation and interviews are utilized to obtain and interpret information,

the researcher then writes a biography about the student, who subsequently reads and

adjusts it as necessary, ultimately verifying it. The result is a clearer picture than the

student would be able to give alone. The best result would be obtained by using a

number of these methods to get rich data and be able to construct the whole story.

Reliance on only one or two methods could result in missing part of the experience and

not obtaining the whole story.

Risks

There are risks to any method of research and narrative inquiry is not exempt. Being a

collaborative process is both a benefit and a risk. The involvement of the researcher in

the process can influence the participant and consequently have an effect on the final

product. The term "collaborative" is used to indicate that both the researcher and

participant are contributing to the content of the writing, but the actual writing of the final

narrative is done by the researcher. Other risks can occur in the collaborative writing

process if the influence of the researcher is overwhelming and the participant is swayed

in their recollection or interpretation of the experience. There is also the risk of what

Connelly and Clandinin (1990) refer to as "the Hollywood plot" or the happy ending

(p.10). A further advisement to users of narrative inquiry is to focus in on the specifics of

a particular event and to avoid trying to generalize. For the particular population under study there is a risk that they may be reluctant or unwilling to write a narrative or be willing to participate in the research.

The majority of research on and using narrative inquiry involves informed participants who have volunteered for the study. "Both researchers and practitioners are participants in the research and, as such, engage in the collaborative process. Both work through a mutual retelling of the story in practice that has been captured in field notes, transcripts, and documents." (Clandinin, 1990, p.128) Most of the research in and on narrative inquiry has been conducted with adult students or practicing teachers who are aware of the research, are active participants in it, and who do not have a personal stake in it (that is, there is no fear that the results of the research will affect them personally). My participants are different because of their age and the nature of the investigation. This will be discussed further shortly.

NARRATIVE INQUIRY – MY RESEARCH

My particular method of narrative inquiry differs slightly from that described above, due primarily to the nature of the participants and some situational factors. This section describes the particulars of the method I used and gives some explanation for the differences from previous studies using narrative inquiry.

As part of my narrative method I collected field notes on my observations during class, took notes on informal conversations or short interviews with students, collected one questionnaire, and kept notes from phone calls with parents and conversations with other teachers. In the early stages the "interviews" were more like informal conversation

during class time. Later, once the students had been informed of the research the short interviews were conducted outside of class time and the students were aware that they were being interviewed. Using these data I constructed a story of each participant's experience in the class. In some cases I collected short stories of their experience written by those students. With these stories I sat down with each participant to discuss the similarities and differences and collaborated to create a narrative of their experience that was as descriptive and accurate as I felt possible, but was also valid and authenticated by the student. In cases where I was unable to get the student to write their own story I used my narrative to encourage discussion and elicit feedback.

My situation was different from other research in narrative inquiry because the objects of my study and intended participants were teenagers who exhibit non-start or early-stop behaviour. Non-starters do not tend produce much in the way of writing nor are they particularly introspective in what they do put to paper. The collaborative nature of narrative inquiry results in a more expressive and more informative description as I could use my language to help express my participants' feelings and experience. However, this is also one of the drawbacks discussed above. By using my language and bringing my experience into the situation I risk influencing the results of the narrative inquiry.

The research method I used also differs from the usual method of narrative inquiry in that I did not ask students to volunteer for the study, nor did I inform students that they were being observed during the initial process. I did this for a number of reasons that are explained below.

No Volunteers

First, I assumed that if I asked for volunteers, those students that were interested in participating would not be the students who I would in fact need to study; that is students who displayed avoidance behaviour. Speaking in generalities, students who volunteer, that is, are willing to give of their time and effort before there is any sort of rapport or relationship with the researcher tend to be those who display self-start behaviour or, at least, tend not to display non-start behaviour. Therefore, I assumed that those students who volunteered would actually not be of interest to this particular research. Consequently, I did not ask for volunteers.

Awareness

Secondly, I was concerned that if students were aware that research was being conducted and that they were under observation their behaviour might change. I worried that it would be more difficult to observe non-start or early stop behaviour if the individuals were aware that it was being studied and looked at. I feared that merely knowing about the research would alter their behaviour and therefore alter the outcome of the study. Children might make the behaviour less obvious or work harder to avoid being noticed. While the idea that being observed might affect students' behaviour is an interesting one, and worth investigating, that is beyond the scope of this research.

Collaboration and Connectedness

Thirdly, as noted by Clandinin and Connelly, one of the important issues in the research relationship is the feeling of connectedness and of the collaborative nature of the research

process (1990). At the beginning of the study the students were new to me and we had no sense of connection or collaboration. The only relationship established immediately is that of the teacher/student and the teacher has the power of authority which is not conducive to feelings of equality and connectedness. It takes time to develop a rapport with students to the point where they are comfortable talking to a teacher and sharing their experiences. And not only was I *a* teacher, but I was *their* teacher, a position that gave me some control over their ultimate result in the course. Therefore the time needed to establish a relationship other than one of an authority figure was another reason I chose not to inform students early in the semester.

Time

Another benefit to having a space of time between the experience and the retelling is the feeling of "safety created by the intervening time". (Clandinin and Connelly, 1996, p.28) Time acts as a buffer so that the experience is not quite so fresh and possibly difficult to talk about. Of course the downside is that as time passes the memory of the experience becomes less clear and less accurate. This is why it is important to have field notes and observations from the time period to review and discuss with the participant. I used these to do prompted recall when I was writing the narratives.

Academic Concern

Finally, if the participants were informed of the research during the course I feared that the focus would be taken off the mathematics at hand, and as a teacher my primary duty

is to teach the mathematics. It was not in the best interests of my students to distract them with the research study.

GENERAL SETTING

The research study was conducted in a first semester Principles of Mathematics 10 course. The curriculum is mandated by the provincial government and there is a comprehensive provincial exam to be written at the end of the semester. At this time there were three courses offered at the grade 10 level. These are Principles of Mathematics 10, Applications of Mathematics 10, and Essentials of Mathematics 10. For a number of reasons not to be explored here, the school does not offer the Applications stream in the regular daytime school schedule. The Principles course eventually streams to Principles 11 which is a requirement for most university programs and many college programs. University science programs generally also require Principles of Mathematics 12. Essentials of Mathematics 10 is more basic, more concrete and less abstract, supposedly more hands-on and useful course than the principles course. Completion of the Essentials 10 course gives entry into Essentials of Mathematics11, completion of which is sufficient for graduation requirements and meets requirements for many college programs and trades programs, but is generally not acceptable for most university programs. Speaking in generalities, parents feel that taking the essentials stream limits their child's options and the push seems to be for every child to take the Principles stream. The result is that many students struggle with the more abstract material and faster paced course, subsequently failing or doing very poorly in the Principles of Mathematics 10 class.

The class from which the participants were drawn follows the same schedule as all other Principles of Mathematics10 classes taught in the school, using the same tests on the same day, and generally following the same outline, with some small variation. There were six Principles of Mathematics 10 classes being taught that semester; this one and five others. Each class differs slightly in terms of instructional choice and level of discipline but the overall structure is essentially the same.

In the school there are approximately twelve to fifteen teachers who have at least one block of mathematics each semester, within that there is a core of about ten who teach only mathematics. The mathematics department has a very good culture and in general tends to be a very cohesive group with similar thoughts on the practice of teaching. Though every teacher and every classroom is individual there are no major differences in the quality or delivery of instruction within the department. This has been discovered through conversations with colleagues and students and through informal observations. The core method could be described as traditional while some teachers use group-projects and other less traditional methods to "liven things up" and provide variety and alternatives to reach more students and better serve individual differences.

The layout and organization of my classroom is best described as traditional. The classroom is large compared to the average mathematics classroom. It is on the second floor and the single wall of windows looks over the football field and the North Shore mountains in the distance. This is noted here as the view provided through the windows often served as a distraction. Two doors lead into the classroom from the hallway, both on the same wall opposite the windows. At the rear of the classroom is pin-up board with student grades (listed by student number, not name) and storage cabinets. For the

majority of the course the tables sat in 4 columns of 4, with two students to a table. The number of students fluctuated slightly throughout the course, but generally there were twenty-six to twenty-eight students enrolled.

It is also important to mention here that there is no school policy on attendance. Therefore there are no clearly defined consequences for being late or absent without a reasonable excuse.

CLASSROOM STRUCTURE AND INSTRUCTION

The physical layout of the room adhered to a traditional model; likewise the instruction could also be termed traditional. Students were emailed a "skeleton" copy of notes and expected to print them and bring them to class. The reasoning behind this was that there is a substantial amount of data to process in one class period of seventy-six minutes and students' time is best spent trying to understand the material rather than writing down definitions. As well, the composition of the classroom includes students who have difficulty writing quickly, or neatly and would otherwise have difficulty getting a transcript of the lesson that they would be able to read and refer to for the purposes of practice and studying.

The structure of the class was fairly consistent. It was the first block of the day, which began at 8:40 am. When students entered there would generally be a task on the board. Completion of the task was not required, but was encouraged and success was usually rewarded with some sort of treat (usually a wrapped hard candy). The type of task varied. Some were logic problems, some were algebraic, some were visual or

pattern based, and some were riddles. The purpose of the task was to get students thinking. Announcements over the PA took up the first five to ten minutes of class and students were given additional time to work on the task after the announcements concluded if they seemed interested. This usually amounted to about five minutes but on one or two occasions lasted twenty minutes. Many students chose not to do the tasks but this did not seem to have any correlation with their performance in the course. After the task was completed (or many days it was not and was left on the board for them to return to later if they wished) students were asked to bring up any questions they had difficulty with from the previous lesson's assignment. As a rule I generally only took two or three questions. I had advised students that if they had more than two questions they had trouble with then they needed to come for help outside of regular class time (either before school or during lunch hour). Following the question period I started the new lesson. As mentioned before, students were expected to have the printed "skeleton" copy of the notes (but often I ended up supplying them). Lessons were conducted using a tablet PC and an overhead projector. The lesson was projected onto the whiteboard at the front of the class and as a group we would go through and complete the examples by hand. Intermittently I would assign them a question to try and would walk around the class to observe their progress and offer assistance if needed or wanted. At the conclusion of the lesson, the next homework assignment was given. Students were expected to begin the assignment in class and complete it at home if necessary. Beginning the assignment in class allowed students to try the questions and see if they had any difficulty with them. On a few occasions, usually due to having a quiz near the beginning of class, the lesson ran later and students did not have time to begin the assignment before the end of class.

I was available to offer extra help before class, at lunch, and sometimes after school. There was a peer tutoring center that was open at lunch throughout the week and after school Monday through Thursday. Other mathematics teachers in the school were also available to answer questions and help.

The course was split into seven chapters and each chapter included two to three quizzes and a chapter test. Quizzes were used as formative assessment, in addition to daily observations, and chapter tests were used as summative assessment. At the end of the course there was a mock provincial that could be used to replace their lowest chapter test mark and then the provincial exam which constituted twenty percent of their final grade. Other assessments included a small number of homework assignments to be submitted for marks, but homework was not checked on a regular basis.

PARTICIPANTS

The composition of the class was varied. The school is the only secondary school in the district and therefore draws from all catchments in the district. The district has a variety of low-income and high-income residents and many different cultures and nationalities are represented. The school has great diversity and thus the classroom did as well.

The students ranged in age from fourteen to sixteen at the beginning of the course. They had varied backgrounds and different levels of facility and ability with respect to mathematics. Some students struggled to do basic problems and lacked understanding of prerequisite concepts whereas a few students needed little effort to achieve great success. As in any "regular" classroom the spectrum was wide with the majority of students grouped somewhere above a passing grade.

Over the first few weeks I identified six or seven students in the morning block as "persons of interest" for my research. A few students stopped showing up and dropped the course or switched to another section for scheduling reasons. In the end I had four students who I worked with to develop narratives to try to understand their non-start and early-stop behaviour.

These four students are Michelle, Luke, Neil, and Aaron.[1]

RESEARCH PROCEDURE

I began my observations on the first day of the Principles of Mathematics 10 course. The first day I do my introductions, take attendance, and give a brief outline and description of the course, including assessment and composition. I advise students that it is a difficult course and will require them to do work outside of class time, at some times necessitating a substantial commitment of extra effort and extra time. Following the introduction I assigned students a task. In this case I had them line themselves up in order of increasing age. The purpose of this task is to get the students moving and hopefully acquainted with a few of their peers as they sort themselves out. It is also useful for identifying who will be a leader in a group as they tend to take charge of organizing everyone else. The other reason is that by introducing an activity on the first day it briefly dispels the notion that this is a typical "boring" mathematics class and that they may find something interesting here. Following the task I taught a portion of the first lesson and assigned the homework task. The reason for this is that I also wanted to instil in students from day one that this is a course that will require daily effort on their

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[1] All names have been changed to maintain anonymity.

part and I did not want to give them the impression even for only one day that they could coast through this course with minimal effort.

In addition to brief observations which I made almost daily, I also used informal interviews to collect additional information. Once a student was identified by displaying non-start or early-stop behaviour I would make informal conversation with them during class while they were working on the initial task before the lesson, or after the lesson while they began the assignment. The questions I asked were dependent upon the particular behaviour exhibited by the student but generally were directed towards finding out specifically why the student was not starting their work.

I used any opportunity to talk to students and try to elicit reasons for their behaviour. In essence I wanted to discover what their experience was and what their feelings were about it. I wanted to know their story.

During the course I did not inform students that I was observing them for any purpose other than a regular classroom teacher. My conversations with them were informal and were aimed at gathering information to help them in the course as well as to add to my research. I began to write their stories and my analysis towards the end of the course. Once I had these stories I used them with my observations and field notes to write a draft narrative.

I had intended to have the students write their own stories and give them to me to enhance my narrative. This was primarily based an article written by Clandinin with the following statement. "In narrative inquiry, it is important that the researcher listen first to the practitioner's story, and that it is the practitioner who first tells his or her story" (1990, p. 4). It made sense to ask the students to give an account first, rather than asking

each one to read my version of their experience. Some time into the second semester (when the course had ended) I asked three of the four participants to tell me the story of their experience in the mathematics class (I could not find the fourth student at the time). To help get the information I needed I included prompts such as: what made you come to class? What kept you from coming to class? What made you study or not study? Why did you do homework/not do homework? Two students never produced the story and one wrote very short, largely uninformative answers so in the end I rejected this path.

When I realized I was having difficulty obtaining written work from them I returned to the literature on narrative inquiry. I believe that the conditions of my study were very different from the conditions under which narrative inquiry has been used in the past. Narrative inquiry is usually used with adults who volunteer for the research. As I discussed above, I conducted my research with teenagers who were uninformed and did not volunteer for the study. I believe that using narrative inquiry with this different population made it more difficult to obtain information than if I had conducted my research under more usual conditions.

Once the course was over and my position of control of the students' grade had ended I attempted to contact each student to show them the narrative. I found that their attendance had worsened and I had significant difficulty finding the students. Towards the end of the year two students had dropped all of their classes.

Even once I had contacted them the students were reluctant to give up their free time to meet with me to discuss their narratives. Eventually I had to contact three of the four sets of parents to get the students to come and see me. In the case of Luke and Neil, it was because they were unaware that I wanted to see them. Michelle was forgetful and

also did not want to be different than her peers. I never spoke to Aaron's parents as he was in my classroom again repeating the course so he never had to give up free time. I never asked him to because I assumed he would be unwilling as he never used his free time to ask any questions and was always one of the first students out the door at the bell.

In preparation for the meeting with each student I omitted any part of the analysis that I thought might offend or injure the student in any way. Taking the appropriate parts of this draft I gave it to the student to read in my presence. I used this to prompt discussion and deeper reflection from the student as well as to elicit further information. The students told me if any of my ideas were incorrect and gave a little more insight into their action or inaction. This information was used to refine the narrative.

None of the students seemed to be upset to find out that they had been observed throughout the course. The only thing that might have bothered one student was being asked to come in during lunch or after school to talk to me. I believe this is because she wanted to be with her friends and did not want to appear different. The parents actually seemed to be pleased that their child was receiving so much attention and hoped that the results of the research would benefit the student.

CHAPTER 3 - RESULTS AND ANALYSIS: BY STUDENT

In this section I will first present the narrative I wrote based on each participant's story. These are based on the observations I made together with discussions with each student, other teachers, and parents. In a sense the story itself is an analysis because I wrote them and chose what to include and what to omit. As mentioned earlier, these stories were shown to the students to elicit their feedback. I included what I wished to share with the student and omitted what I thought might provoke a negative reaction. For this reason there is some data present in the analysis that follows each narrative. I constructed the analysis of their behaviour using a combination of the theories of motivation discussed earlier. A combination is used because no single theory could be found to accurately describe all students' behaviours, nor even one individual's behaviour. It was also found that some results could not be explained using any of the theories. This and other emergent themes will be discussed further in a subsequent chapter.

MICHELLE

The Story

Michelle was a pleasant, quiet, and seemingly shy student. She was in grade 10, taking the Principles of Mathematics10 course for the first time. She did not appear to exhibit avoidance behaviour at the beginning of the semester. She appeared to be thinking about whatever the problem of the day was, paid attention during notes, and worked on her homework during class time, albeit slowly. It was not until a month in when I noticed that she was starting to accrue unexcused absences. She started to miss days when there

was a test and at two months in would only appear in one to two classes every week. In many of the classes she did attend she would appear up to half an hour late. This was the first block in the morning.

Both Michelle and her mother made excuses for her behaviour. Michelle's mathematics class began at 8:40 am and she had trouble getting up on time for school. Her mother had switched jobs in the past year and now worked outside the home, requiring Michelle to get herself up and off to school. Her mother pointed out that this is difficult for any fifteen year-old and that she felt school started too early in the morning. Michelle's mother's philosophy was to let Michelle make her own decisions and hopefully learn the consequences of her own actions. Michelle had done very well in mathematics up to and including grade 7 math. In grade 8, due to some factors outside her control and some personal issues she had a very difficult year and likely missed a lot of the key concepts in her mathematics class. She barely passed Mathematics 9 primarily due to absences and lack of effort.

I know that Michelle had some personal problems outside of school that influenced her behaviour during the semester but I do not know the nature of the problems, only that things were improving.

Her mother and I made extra efforts to help her. Her mother was willing to hire a student to tutor her, and I went to the effort to find a tutor, give the tutor a list of topics Michelle needed to work on, searched out Michelle's old tests for the tutor to review with her, and set up a time for the two of them to work in my classroom after school. After Michelle missed the first tutoring session I made a point of reminding her and staying for part of the next session to facilitate. I found out later that Michelle left that session early,

and never made it to another one. Her mother later found out that Michelle did not like meeting the tutor at school and did not like the time that was set up, but did not tell her mother until she was confronted about the issue.

Michelle did not avoid every facet of mathematics. When she was in class she seemed to pay attention and would take some notes. She would read and make a weak attempt to try problems in class but I rarely saw any homework assignments even partially completed. Occasionally she might ask a question if I was in close proximity, but would not put up her hand if I was across the room.

When I first noticed her avoidance behaviour I created a short questionnaire to ascertain her feelings about mathematics. There were twenty-two questions that she was asked to rate on a scale of zero to ten where a zero indicated she did not agree with the statement at all and a ten indicated she really agreed with it. Some examples of questions were: "I avoid doing math whenever possible", "If I don't understand something I'll would ask for help", "I won't come for help outside of class unless I am forced to", "If I don't understand something in class, I ask my classmates", "I think it is important to try the homework but I still don't always do it", "I avoid doing math because it makes me feel stupid if I can't do it", and "I do enough homework to make sure I pass the test". Michelle indicated that if she didn't understand something she wouldn't usually ask for help and didn't like asking questions in class. However, Michelle did respond that she would be comfortable asking a friend but it seemed like she did not have any close friends in the class. I never saw her ask anyone else for help. In retrospect, it seems she would only ask if she sensed that I could tell she was either not working or was having difficulty with something.

She did not ever appear off-task; by that I mean she never substituted activities instead of doing mathematics (she never wasted time sharpening a pencil, looking for other materials, and didn't make repeated or frequent requests to leave the classroom to go to the washroom or her locker), and did not seem to just stare off in space doing nothing. When she was in class she was working on math, either doing examples or reading her notes. Reading her notes could have been construed as a substitute activity, but I believe she was sincerely reading them and trying to figure out how to do a specific type of question because occasionally she would flip back to the homework and attempt a question.

Michelle needed explicit, specific direction; for example, if she needed to put in extra time with a specific concept she couldn't just be told to work on it – she needed to be given a particular time period and specific questions to work on. What seemed to work best was to ask her to come in either at lunch or after school and give her material to work on when I was around. She stated that about half the time she wouldn't come for extra help unless she was forced to do so but when she was explicitly told to come at lunch or after school she did. Michelle also said that if she didn't understand something it was very difficult for her to pay attention in class.

In the fourth month (of a five month course), Michelle's mother told me that Michelle had told her she knew she needed to come to class, focus, and do her work but didn't do so. Her mother said that Michelle doesn't connect her choices to the consequences that follow. I believe that if Michelle does make the connection between choice and subsequent consequence, future consequences do not have the power to motivate her to make the right decision in the present time. Michelle stated that she knew

that she would need mathematics in her future and indicated that she knew it is very important to do the homework but still didn't always do it. She never gave a concrete reason for this other than being busy doing other things. One of her most telling statements was that she just wanted to pass mathematics and get on with her life. This indicates that she feels mathematics is only a hoop she needs to jump through and has little importance.

During a conversation with Michelle she told me that she didn't understand a significant amount of the material she was taught in class. She also said that she was not concerned about looking smart or looking dumb in front of her peers yet also indicated that she avoided mathematics because it made her feel stupid if she couldn't do it. She stated that about half of the time she liked a challenge but much preferred easier questions, even if they were boring. Michelle said that most of the time she would avoid doing math. When she did do homework, she reported her motivation was generally to do well on the test. Michelle claimed that when she understood the material and was doing well, she liked mathematics but when she found it confusing she said she didn't like it.

Michelle's attendance and lack of effort outside of class time was not just a problem in mathematics. As I found out from other teachers and from her mother, she was missing assignments and not attending her other three classes as well.

With about a month to go and very little hope that she would pass mathematics (and even if she did she would be at a serious disadvantage if she tried to take the next course) her mother and I decided that she would attend my class to show her commitment to making amends but would work on material from her other classes in order to catch up

in those courses. In return, I would recommend that she take Essentials of Mathematics 10 (a course with limited spots and priority given to students who worked hard but had serious difficulty with material in the Principles stream). Michelle showed up to class for the majority of the remaining time and used it to work on her missing English assignments.

In the second semester Michelle took Essentials of Mathematics 10 in the block following the lunch hour. She had the same difficulty with attendance and barely passed the course. She was highly social with her peers in the class and did not do much of the assigned class work despite sufficient class time. She did well on tests due to the relative simplicity of the material.

Analysis

There are several pieces of evidence that I have used in my analysis of Michelle's behaviour. The most noticeable support for my conclusions is Michelle's absences. Initially her absences were only on days when there was a test. Her avoidance of assessment is a defensive behaviour. Another significant point is Michelle's avoidance of the tutor based on the time and location of the session. The tutoring was planned to start directly after school in my classroom. This would mean Michelle couldn't hang out with her friends after school and they might discover the reason for it.

Rarely asking for help is another indicator. Michelle would not raise her hand to ask a question when students were working. She only asked if I was nearby and she knew I was watching her. The majority of time I initiated the process.

All of these factors indicate that Michelle falls into Hannula's socio-emotional category of ego-defensive orientation (2006). She exhibited a significant amount of ego-defensive behaviour in her avoidance of class. Her thought process could be that if she doesn't come to class she can't be expected to understand the material she's missed. Also, she avoids class because she doesn't like the feeling of not understanding the material, which is typical self-defence behaviour. If she misses that class she is not responsible for the material, in her mind. She may believe that I will hold her responsible, but in her own mind, if she has missed class then she can't expect herself to understand the material which may take some pressure off her. She stated that she missed classes because she had trouble getting out of bed and while this may have been a partial reason it does not tell the full story.

Avoiding the tutoring and not asking questions in class support the conclusion that Michelle had an ego-defensive orientation. She didn't want to look dumb in front of her peers and having a tutor or asking questions in class would draw attention.

She did not exhibit other ego-defensive behaviour such as substituting activities when she was supposed to be paying attention to a lesson or doing practice questions. She never appeared to be off-task but seemed to avoid or delay starting a task or spent a significant amount of time reviewing notes or staring at example questions. I believe she delayed starting her homework because she didn't like doing it. The homework made her feel incompetent when she couldn't do it. She stated she didn't like feeling dumb and the homework questions tended to be difficult for her. This also gives insight into Michelle's views of what was required of her in class. She followed the notes and was not disruptive but did not complete the homework.

Michelle was fairly social before class started and near the end of class just before dismissal, but did not spend time talking during the lesson or work time. Her social needs were not taking precedence during class; there were other factors that slowed or stopped her progress with the assignments.

Based on discussions with other teachers it appeared Michelle's ego-defensive orientation was not contained to her mathematics course. Her behaviour was consistent in all her classes and she followed a pattern of avoiding classes where she has fallen behind, or courses she has difficulty with or doesn't like (there may be some correlation here). This avoidance nature together with my observations and conversations with Michelle signifies her ego-defensive orientation. She feels bad when she doesn't do well and doesn't meet expectations (her own and others) and therefore avoids situations where she could be made to feel responsible and guilty. This coping strategy is problematic because the more classes Michelle skipped, the more material she missed, the lower her mark drops and the worse she feels. It is a positive feedback loop, that is one where the coping strategy feeds the problem and creates a self-destructive spiral.

I think Michelle didn't try because she was afraid to find out that she couldn't do it. Deep down I believe she is afraid she is dumb, or possibly she already thinks she is stupid and doesn't want other people to find out. In order to avoid this she skipped class and avoids responsibility (in her own mind) for understanding and knowing the material. Michelle seemed to have low self-confidence and a poor self-image when it comes to mathematics, or even school in general. In a number of instances, Michelle's statements do not agree with her actions or my interpretation of her actions. Her claim that she was not concerned about looking dumb in front of her peers is countered by her tendency to

avoid asking questions and not wanting to come for tutoring in the school, shortly after school hours.

When using Self-Determination Theory (Deci and Ryan, 2000) to explain Michelle's actions it appears that at times she was extrinsically motivated. When Michelle did work I believe it was motivated by guilt and a desire to not look dumb. Michelle did not want to fail, but I think unconsciously she believed she wasn't capable of doing the material but was afraid to find out and have others find out. It was easier for her (both in terms of effort and emotionally) to avoid class and absolve herself of responsibility for learning the material. Based on this, I believe Michelle falls into the realm of external regulation and introjected regulation. It could be argued that she was amotivated based on her feelings of incompetence. Despite the fact that Michelle voiced a belief that mathematics was useful, I do not believe she had internalized it. The guilt, shame, and self-worth Michelle attaches to her performance suggests that she displays introjected regulation, but the guilt she felt seemed unable to motivate her to come to class and do work outside of class time. This is a common theme. Michelle's immediate needs overrode the motivation from guilt to attend class. Her behaviours did not seem prompted by external factors such as reward or punishment in that she did not seem motivated to get high marks nor did she seem to fear reprisals from her mother or from me.

At other times Michelle seemed amotivated. Using the amotivation subsets proposed by Green-Demers et al. Michelle appeared to have a deficiency in ability beliefs in my classroom. She had low perceived competence and does not seem to expect to do well with mathematics. It doesn't appear that she had a deficiency in effort beliefs as she

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had no difficulty making the effort during class time. I am not certain that Michelle placed insufficient value on academics; she implied a belief that school was important and that mathematics was important, however she may not have internalized this belief. I think that Michelle found the characteristics of the majority of the tasks in class to be unappealing but I don't believe this was a reason or cause for her amotivation.

Lastly Michelle's behaviour can be viewed through her interpretation of the didactic contract. From her actions and my observations it appears Michelle interpreted fulfillment of her portion of the contract to be attending class, following the notes and attempting her homework while in class. Even though she did not attend class, it is evident from her guilt that she knew that she was breaking the contract by skipping. My end of the contract was to leave her alone unless she requested help. If I pushed her too hard it contributed to her skipping class.

In summary, although it does not provide a complete picture, Michelle's behaviours and motivations are best explained using Hannula's socio-emotional orientations where she falls under the category of ego-defensive orientation. Michelle seemed to carry a lot of emotional weight. She felt guilt for missing class and doing poorly, yet this was not sufficient to motivate her to come to class and do her homework. To try to escape the guilt behind not doing her homework and not understanding the material Michelle skipped class which only exacerbated the situation. I think she essentially believed that others such as her mother and me felt mathematics was important but she had not internalized this belief nor integrated it into her self-beliefs and self-concept. The importance of mathematics was not aligned with other values Michelle held.

The Story

Luke is a very personable young man; approachable and talkative. He is sincere and honest but not particularly reliable.

I noticed Luke exhibiting non-start behaviour in the first week of class. He did not start his homework when the class had been instructed to do so. I also observed that he was playing cards with another student at the beginning of class. This occurred more than once over the first few weeks. On most of these occasions the two boys had to be asked to stop as they continued to play after class had begun.

During the third week Luke began sleeping in class. It was no use to wake him as he was unproductive even when awake. He might start taking notes for a few minutes and then start doing something else. In a class later in the week he was reading a novel during the lesson. When I asked him why he was reading instead of paying attention to the lesson he claimed he just liked to read.

Luke continued this pattern of not taking notes and not starting the homework when asked. Once Luke had claimed he was unable to print the notes he was supplied with copies for the remainder of the year. When he did do homework he was usually slow to start and required prodding. He was easily sidetracked and would be on-task for only short periods of time. During a lesson or during work time he would substitute activities such as doodling or drawing, usually with a felt pen.

Early in the second month I told Luke to come in that day after school for extra help. He never showed up and claimed he had forgotten. Shortly after this Luke started missing a number of classes. His mark slipped to just above fifty percent. I phoned

home to speak with his mother and found out that she was dropping him off every morning fifteen minutes before school started which gave him ample time to make it to class on time. He was at school but not attending class. He usually didn't leave the school grounds, but could be found somewhere in the building. When asked, Luke shared that he was helping his friends who were having personal difficulties. Luke showed up the day after my conversation with his mother but appeared a bit sullen. He did not take notes that day, but did get a passing mark on a quiz. The pattern of avoidance and substituting activities continued as he was observed reading the newspaper, colouring with his felt pen, and reading his English assignments during the lesson. It was only when he was approached directly and confronted that he would reluctantly begin a practice question.

This pattern of absences continued for the remainder of the semester. On several occasions Luke made promises to come to class and assured me that he wanted to pass mathematics class and would put in the required effort. He seemed sincere but his absences continued. Even when he came to class he showed little effort or motivation to work. On more than just the one occasion he slept during the lesson.

In subsequent phone conversations with his mother regarding his absences and overall performance I was informed that she continued to drop him off at school every morning. On one particular morning she escorted him to his mathematics class and waited outside the classroom until class had begun. None of this seemed to improve or affect his attendance.

On one occasion Luke actually left the class early (dismissed himself) before the bell and without permission. He just disappeared. When I spoke to him the next time I

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saw him he said he had to go (but didn't supply a reason) and it was obvious from his tone and body language that he didn't think it was a big deal. During this conversation we discussed his past history with mathematics. He informed me that he had liked mathematics and done well in it at his elementary school, a private school that was about one or two years ahead of the public school in terms of the level of the material and topics covered. Therefore when he came to a public high school he was able to coast through Mathematics 8 and Mathematics 9 without having to learn much new material. He said that he consequently developed a bad habit of not doing homework and not studying for mathematics. So his current situation was that he is out of the habit of studying and was missing or had forgotten some basic knowledge from earlier years. He said that now he doesn't think he's very good at mathematics and just wants to get through it.

Once when he had missed class he said that he wouldn't be missing any more as his friends had "threatened" him that he had to go to class because they didn't want him to fail. Surprisingly, he missed the next 3 or 4 classes.

When Luke did questions he tended not to show any work – he worked on the calculator or did it in his head. He was extremely reluctant to show any work on tests despite direct verbal requests that he do so.

On the last day of class while the students were supposed to be reviewing for their practice provincial and actual provincial exam Luke was reading a novel. He did a few practice questions when he was under close supervision, but quickly returned to the novel when I walked away. I asked him about his behaviour, especially since he needed to pass the provincial to pass the course. It seemed like he just didn't care – he claimed he got

confused when he looked at the questions but had little trouble with the first couple once I stayed with him to make sure he did them. When asked specifically why he kept returning to the novel, even when the exam meant so much and time was short he could not supply an answer other than he just really liked the book.

In conversations with Luke he claimed that he thought mathematics was important but that he just wasn't good at it. He volunteered that he "can't make himself work".

Despite his inability to make the effort to do work, his numerous absences, and his inattention while in class, Luke managed to just barely pass the course.

Analysis

Luke's comments and actions lend themselves to a number of possible conclusions. First, however, it is possible to eliminate some explanations for his behaviours.

Using a socio-emotional theory (Hannula, 2007) Luke does not appear to fit nicely one specific orientation. Luke did not complete tasks for their intrinsic value and he clearly did not respond with enthusiasm or interest when faced with a challenging task. These are characteristics of a task orientation (Järvelä ,1998) and Luke's lack indicates he did not have a task-orientation. Neither did Luke have high expectations for success, dependent upon teacher help. He did not ask for help unless I was almost standing over him. He did not look for my approval or have any interest in complying with expectations (Veermans and Järvelä, 2004).   Luke avoided independent effort, but not because he doubted his ability to succeed without help; it was because he didn't want to make the effort. He chose to do other activities that he found more attractive. This indicates that Luke did not have a social dependent orientation. Self-defense was not the

primary motivator for Luke. He did find excuses for his behaviour, and these might have given him some justification and consolation for his failure, but I don't think his ego suffered much from his failure. He was not concerned about looking dumb in front of his peers, nor was feeling stupid his reason behind not asking for help. He may have had an avoidance orientation, a term used by Boekaerts (1999) and discussed in chapter 1, but I don't believe it was because his ego suffered from coming to mathematics class. Therefore he did not have an ego-defensive orientation. Out of the three different orientations Luke does not fit into any very well.

Turning to Self-Determination Theory (Ryan and Deci, 2000) it appears that this is better used to describe Luke's behaviours. Luke was at different times either extrinsically motivated or amotivated according to SDT. He did little to regulate his behaviour in mathematics class; he was not often interested in trying to comply with my expectations or those of his mother. When Luke was motivated it was regulated externally. He complied only at times when he wasn't tired, wasn't absent, and didn't have something more interesting to do. His motivation came from a reluctance to directly disobey a request when I was in his presence. When he was working and I was not sitting with him it was likely because he had nothing he wanted to do more at that moment. This did not happen very often; the majority of the time he was amotivated. "When people are amotivated they lack an intention to act, and either they do not act at all or they act passively. This happens when they are not valuing the activity or the outcomes it would yield, or when they are not feeling competent to do it (Ryan and Deci, 2000)". Luke's behaviour fits this description well. "Passive" is a very good word to describe Luke. He seemed to let things come to him and in general didn't do anything he didn't feel like

doing. By his own admission he did not value mathematics; it was a hurdle he needed to jump in order to graduate and move on. He did not care about doing well or understanding it and he would do as little as possible to clear the hurdle.

Exploring the reasons for Luke's amotivation using Green-Demers et al. expanded categories sheds a little more light on the situation. Based on observations and conversations it appears that Luke has deficiencies both in ability beliefs and in effort beliefs.

Luke's refusal to show work may signify that he did not see value in the process, or that he chose not to do questions that require him to do work beyond plugging numbers into his calculator. He was not disrespectful of authority; he just didn't see a reason for showing his work. Even though he didn't say it explicitly I believe part of the reason he didn't do work is because he was lazy. Here "lazy" means that he was unable to make himself do the work and had no interest in doing so. I think Luke found the questions he could do to be boring and the ones he couldn't do confusing. Once he found himself confused he was quick to stop working. He would not persevere on his own or ask for help. Interestingly, he would also stop working when he wasn't confused. From my observations and conversations I believe this is because once he found himself capable of doing one or two questions he figured he could do the rest and didn't see the point in spending the effort. He didn't ask for help because he didn't want to make the effort. The most interesting train of thought I found here was that if he found a question easy there was no point in doing it; if he started a question and got stuck he quickly abandoned it; and if he looked at a question that was difficult he didn't try it. So when

would any work get done? All of the above behaviours contribute to a diagnosis that Luke was deficient in effort beliefs.

Luke was not worried about looking dumb or stupid to others. He didn't fear appearing incompetent, but did state that he wasn't good at math. I think Luke used excuses like helping his friends and substitute activities to absolve him from some of the responsibility for the material. He may have understood that others still held him responsible for learning it but I think his excuses in some way justified his failures on tests and quizzes to himself. Luke's reasons for skipping class might have been to avoid doing mathematics and if he missed class he may have felt that he couldn't be expected to know something he wasn't present for but I don't believe he was motivated to skip class so as not to be responsible for the material. It was a by-product, not the primary reason for his absence. Luke got a positive feeling out of helping his friends deal with their personal problems. This was a substituting behaviour, seemingly legitimate, but actually not. This could have best been done outside of class time, but Luke decided it was necessary to do it instead of coming to mathematics class. His priority was his need for relatedness, not his need for competence. So although Luke did not care much for what others thought about his mathematical accomplishments, he did not have a high opinion of his own capabilities in mathematics, and on most occasions he was unwilling or unable to do the work required. This indicates that he had a deficiency in ability beliefs.

Additionally, Luke did not place a high value on academics. This is evident through his history of absences and his observed opinions about mathematics and about school in general. I believe he thinks that mathematics has no utility for him. On more than once occasion he voiced his goal to "just get it over with".

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Lastly, the unappealing characteristics of the tasks in mathematics likely was a factor in Luke's amotivation, but was not the primary factor.

Luke's interpretation of the didactic contract also gives insight into his behaviour. Luke considered himself to be fulfilling his part of the contract if he attended class even if he slept through it. He did not feel that he had to take notes, do work, or ask questions. I believe he was satisfied with just being physically present and not causing a disruption. If I pushed Luke to comply with my definition of the contract then he sometimes reacted by not coming to class.

In conclusion, no single theory accurately provides a full picture of Luke's comments and behaviours in this mathematics class. At best he can be described as amotivated based on a deficiency in effort and ability beliefs.

NEIL

The Story

Neil was personable and agreeable young man. He appeared highly confident and sure of himself. He was not especially talkative or open with me, but seemed to get along well with his peers despite being a year older than most of them because he was repeating the course. Neil was far from a self-motivated learner. When he was in Mathematics 9 his regular teacher got sick and the replacement lacked classroom management skills. The result was mayhem in the classroom and only those students who were truly motivated to learn actually processed the material. Neil was not one of these and therefore missed a number of key concepts but somehow passed the course. When he first took Mathematics 10 he had difficulty because of his lack of prior knowledge. His reaction to

adversity was to stop trying. His mother said she thought he had lost confidence in himself. Once she found he was failing his first attempt at Mathematics 10, she hired a tutor and Neil's marks improved. Near the end of the course he decided to stop working with the tutor, stopped studying and doing homework, and consequently failed the course. My course was his second attempt at Mathematics 10.

Neil began the year by skipping the first few days of class. This was a pattern that would continue throughout the semester. He never made promises to come, neither did he volunteer the information that he would not be attending. I never knew if he would be in class or not. I'm not certain he knew on one day whether he would show up the next. He gave no indication. Some of his absences were blamed on illness; he was diagnosed with mononucleosis in November. He had significant trouble getting up in the morning, probably because he seldom went to bed before midnight. His mother excused him by saying he had sleeping problems. She said she woke him up every morning but often he would not get up, or would get up and then be in the shower when she went to work. It was quite a trial to get him going in the morning. Sometimes he would get up but then go back to bed once she had gone.

I believe the mother was looking for reasons to justify his behaviour. She confessed that she was grateful when he was diagnosed with mono because then she had a reason for his behaviour. She kept making excuses for him throughout the year and Neil continued to make poor decisions. He skipped class, he neglected his studies, he got in trouble outside of school. His performance on tests varied. He would do very well on one chapter and then fail the next. It seemed like he was relying on what he had learned

previously and was making little attempt to learn any of the material that was unknown to him.

I believe it was difficult for Neil to attend the first class in the morning. He stayed up late at night and was tired; even more so when he had mono. However, his behaviour was similar in his other classes and in past years. He had one other academic course and two non-academic (electives). His attendance was poor in all of his courses and he was failing his academic course. He had failed one of the electives already and was repeating the course.

Neil was in frequent contact with the vice-principal who monitored his attendance and discussed his choices with him. We both felt that he had potential and was performing well below his abilities. On more than one occasion I told Neil that I thought he was capable but that he needed to work harder.

I sat in on a meeting between his mother and the vice-principal. His mother expressed her frustration and confusion. She didn't understand his irrational behaviour and Neil couldn't or wouldn't explain it to her. Confronting him about school only resulted in huge arguments and was detrimental to their relationship and counter-productive to improving his behaviour. She was trying to get him to see a psychologist to work on his sleeping patterns and what she saw as his unexplainable irrational behaviours.

Near the end of the semester Neil failed two tests and his mark dropped to below 50%. He hadn't bothered to study for either of them but did attempt most of the questions. He put himself into a situation where he had to pass the mock provincial and the provincial exam to pass the course; a difficult feat for someone who had missed over

half the classes. He failed the mock provincial and went in to the provincial exam with 49%. He needed 54% on the provincial to pass the course.

He ended up coming in the day of the provincial because he thought it was at 9:00 am, but it was actually at 1:00 pm. As a result he spent the morning studying in the classroom. He worked on a practice provincial but did not ask questions. Even when I stood next to him he did not ask for help. I had to volunteer and interrupt him to point out that he was doing something incorrectly because he would not ask if his answer was right. While he did not ask for help, he was not especially resistant to it. He accepted my help once it was offered and did not seem unhappy about it. I must admit I did not have high hopes for his success. Interestingly, when the results of the Mathematics 10 provincial were reported Neil had passed the exam with 72% which resulted in his passing the Mathematics 10 Principles course.

Neil started taking Principles of Mathematics 11 with another teacher in the second semester. He only attended one class the first week (it was the later morning block). Based on his attendance and poor performance on the first quiz Neil was removed from the course. In fact it appeared that Neil was not attending any classes which made it very difficult to track him down. Eventually I contacted his mother to get her assistance. Once she told Neil that I wanted to see him he showed up the next day. He had no reluctance to talk to me, though he wasn't very forthcoming. He read my version of his "story" but had no comment to make other than it was "pretty much all true". It was difficult to get Neil to open up.

His next plan was to take Mathematics 11 Principles through the "Virtual School" – a self-paced distance education program. This likely was not a good idea as Neil had never shown any signs of being self-motivated to learn.

Analysis

Neil exuded confidence. If he believed that he was dumb or that he couldn't do the material then he hadn't admitted it to himself or he was very good at hiding it. I think Neil believed he could do the math, but did not try for reasons I will explore further here.

Neil had said to the vice principal that he felt that when the time came, when it was important to do well, he would make the effort. For him, this meant when he needed to get into college or during college. The problem is that he won't have the background and the basics he needs when that time arrives. He was setting himself up for failure when it actually matters to him. Neil wanted to go to college and get a business degree. He must have known that he needed this course and subsequent mathematics courses to get into college, not to mention the mathematics courses he would have to take once he started a program. It is interesting that knowing this was not sufficient motivation for him. I believe this was too far in the future to have any effect on his efforts in the present.

Neil never gave any excuses for missing class. He just showed up, or he didn't. He had a high level of autonomy and this may have superceded his need for competence in school. In fact he was capable but his marks did not reflect that. My analysis was that he skipped class because he was tired, or sick, or possibly because he felt he didn't need to attend to learn the material. Failing tests did not disabuse him of this notion.

He exhibited substitute behaviours. These included sleeping instead of coming to school and when in class he would sometimes chat to his friends. Occasionally he would use his phone to text other people, usually after he had finished a test or during homework time. Phones were not permitted in the classroom but I chose not to fight that battle with Neil.

Neil's good performance on the provincial exam reinforces my thoughts that he was performing below his capabilities. However, I think this is a bad result because it reinforces Neil's self-destructive patterns of behaviour. It has taught him that even if he skips class and does almost no amount of homework or studying during the course he can obtain a mark much better than just a pass by cramming for a couple of hours on the day of the exam.

A socio-emotional theory does not suitably explain Neil's behaviour. He did not engage in tasks for their intrinsic value and therefore did not have a task orientation. He never requested and definitely didn't rely on teacher assistance for success which indicated he did not have a social dependent orientation. Neil's avoidance of mathematics class didn't have anything to do with ego-defensive motives. In fact, he seemed to have no strong emotions at all when it came to learning mathematics. Therefore any theory based on emotions would be incapable of describing Neil's avoidance behaviour based on the data I was able to gather.

Neil could best be defined as amotivated in terms of self-determination theory. Ryan and Deci (2002) do not provide much information about this category therefore it is more useful to look at the expanded categorization of amotivation supplied by Green-Demers et al. (2006).

Neil showed no signs of having doubts about his competence in mathematics. In fact, he seemed to think he was quite capable, or would be if he put in the effort. This tells me that Neil did not have a deficiency in ability beliefs. The fact that he was unable to motivate himself to come to class and never did work outside of class time indicates that he lacked the ability and the desire to make the effort – he had a deficiency in effort beliefs.

He likely found the characteristics of the majority of the tasks to be unappealing but this was not the primary reason for his amotivation.

It is fairly clear that he did not value coming to class or doing homework. This was not only a factor in mathematics but also all of his other classes, academic and elective. This indicates that Neil may place a low value on academics. I know his mother places a high value on academics but I believe his father places more emphasis on learning by doing. His mother told me that his father wanted Neil to work for him and was not a fan of more schooling. This may have created a sense of dissonance for Neil and as it appeared he connected more with his father may have influenced his beliefs about the value of academics.

Neil's interpretation of the didactic contract was very different from most students. He did not feel that he had to attend class, do homework, ask questions, or take notes. When in class he was not disruptive so I believe he thought that was part of his duties. He felt he had satisfied his end of the bargain if he wrote the tests and managed to pass the course.

It can be seen that the primary factors behind Neil's amotivation were a low value of academics and a deficiency in effort beliefs.

AARON

The Story

Aaron was a friendly, approachable student, and seemed open to receiving help. He was very agreeable and honest. He had difficulty getting to class on time, but did not have an excessive number of absences to begin with.

Aaron was not always on task when students had time to work on the assigned practice questions. He sat next to a student who could afford to be off-task because he did his homework at home and understood the material. Aaron however, rarely completed his homework and had difficulty with a lot of the material. He demonstrated this with poor performance on tests and quizzes and often displayed a lack of understanding when doing assigned work.

It was usual for Aaron to come to class unprepared. He often came to class without the notes. Eventually I began handing him the notes to try to keep him up to speed. Even with the notes he needed to be reminded on more than one occasion to follow along in his notes during the lecture.

Aaron's difficulties with mathematics came from multiple reasons. In some areas he had weak basic skills. One example is that he could not remember how to use the Pythagorean Theorem, with which he should have had two years of experience. He passed the first four chapter tests and failed the remaining three. His marks didn't start out particularly well and got progressively worse throughout the year. He was in a downward spiral and as mathematics is a subject that builds on previous knowledge Aaron had great difficulty because there were holes in his foundation. He didn't respond

to admonitions that he should study and come in for extra help – he came in a few times and only when explicitly directed to come in at a specific time.

When confronted about not being on task he was always apologetic, and seemed to have good intentions, but rarely did he follow through on any of his assurances. Most of the time he required prompting to start his work, and often would make a brief attempt and then be off task again, although in some instances he could be quite determined to complete a question and to understand it. It seemed that when he did not know how to start and he became discouraged quickly. He rarely asked me for help but seemed more likely to do so if I was in close proximity rather than across the room. At times I had to stand next to him to get him to stay on task. When Aaron understood something he seemed more able and more likely to work at it. When he didn't understand something he got derailed and rarely asked for assistance. I often noted that he was difficult to motivate when he found something too difficult.

Aaron occasionally got help from another student in class who had a tutor and who ended up getting a B in the course. He also worked with his assigned seatmate, who ended up with a very high A. This only happened on occasion as Aaron did not ask for help often, either from me or from his classmates. Near the end of the course Aaron moved to sit next to a group of three boys at the back of the class, one of whom was failing badly and the other two were barely passing but were making an effort. This situation was to Aaron's detriment as this group was more likely to encourage non-start behaviour by replacing working with chatting.

Aaron's off-task behaviour consisted of semi-legitimate substitute activities. He would appear to be reviewing his notes but never seemed to make any progress with

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them. He did not ask to sharpen pencils, take long or frequent bathroom trips, or spend a lot of time organizing his notes or binder. Neither did he substitute activities such as studying for other classes or reading a novel or the paper. It seemed to take him a while to open his textbook and get started. He would appear to be doodling or just staring at his paper. Essentially he seemed to be delayed in starting, like putting off a task one finds unappealing or overwhelming.

In the last two weeks of the course, once Aaron had determined that he was either going to fail, or pass with about 50%, he decided to redo the course rather than switch to Essentials. He was capable of doing the material but had difficulty actually doing the required work.

Aaron retook Mathematics 10 Principles in the second semester and ended up in my class again. The class began after lunch hour. This resulted in fewer lates and absences. I felt it was necessary to force him to sit at the front of the class so that he would be less distracted. This seemed to work quite well as it seemed easier for him to focus with fewer distractions in his view. He began the course in the same way as before – he came without notes. He wasn't doing his homework – but was doing well on the first quizzes. This is likely do to some retained learning from the previous semester.

Aaron had better results in the second semester. He sat alone at a table in the front row for the first two months, then periodically would move to the back to work with another boy who happened to be getting a high A. Aaron still appeared off-task at times and chatted with the other student but I think he made the decision to move there because he felt the student could help explain things to him. He continued to come to class

without notes, but his off-task behaviour decreased and he seemed to be more motivated to do the work and pay attention during lessons.

Sadly this changed near the end of the course. Aaron's attendance became very sporadic and he missed some tests. It was difficult to get him to come in to make them up, and when he did write them he did very poorly. It was clear that he hadn't studied and he couldn't rely on past learning because he'd skipped the same sections in the previous course. I knew he wanted to remain in the Principles stream so I advised him that the counsellors probably wouldn't let him take the course a third time but he was not concerned. He told me he was attending a different school the next year and that he was already enrolled in the Mathematics 10 Principles course there.

Analysis

I believe Aaron didn't ask for help because he either felt he could do it on his own, or felt he should be able to do it alone, and because sometimes he wanted to avoid doing the work. I don't believe he was afraid of looking stupid in front of his peers based on the fact that he didn't avoid asking questions around his seatmates. He never refused help when it was offered which signals to me that he wasn't embarrassed by needing it or receiving it. By his own admission Aaron was just lazy. He didn't want to put in the effort necessary to do well, and then things started to snowball once he'd missed some key concepts.

Even though Aaron voiced good intentions he seemed unable to follow through on them. I believe he intended to do what he promised but other things were given higher priority when the time came to follow through. He gave excuses for not doing homework

which varied from "I forgot" to "I had a soccer game" to no excuse at all, just that he "meant to do it". On one particular occasion when asked about his homework (because he had been warned the previous day that I would be asking him for it) he said "I meant to do it last night but I forgot so I was going to do it at lunch but I went to the mall." This intrigued me because he didn't say he forgot at lunch – just implied that he made the conscious decision to go to the mall instead. He made a choice, demonstrating that he knows what he should do, but chooses other options. He made no excuse for his decision either, which is also interesting. Essentially he chose to do what was most interesting or important for him at that time. His social needs took precedence over his need for competence.

Based on his decision to retake the course rather than take the credit for Essentials I know that Aaron has goals that either require completion of the Principles stream, or he does not want to be in the "dumbed down" stream for personal reasons. This could be due to fear of looking dumb in front of his peers, but I think it is more that he realizes he is not stupid and is capable of doing the Principles stream. Based on conversations and observations Aaron does not think he is dumb or incapable of doing the material. Unfortunately this was not enough to motivate him to put in the effort needed to succeed.

If I had to describe Aaron as a mathematics student in one word it would be lazy. He actually described himself as lazy a number of times. Aaron wrote,

> "Math 10 was fine. I didn't like the fact that the stuff I learned was a bit too hard and it required a lot of effort. I came to the class because it was my responsability [sic]. I didn't come to the class when I slept in. I did work in class because I wanted to get a high mark. When I didn't work in class sometimes because I got lasy [sic]. I studied because I felt like I had to. I didn't study for the simple reason that I got lasy [sic]. I brought notes to class

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so I could learn the lessons easier. Sometimes I forgot to bring notes, that's why I didn't have them. I took notes sometimes because I felt like it would be helpful when I review for a test. When I didn't take notes because I considered that it wasn't so important or I just got lazy again."

Interestingly, Aaron gave me this paragraph after he had missed two classes. When I asked for a note he told me that he had skipped. When I asked why he had chosen to do that Aaron told me that he skipped the first day because he went home from lunch and came back late. The second day he explained he skipped because he felt bad as he hadn't done his homework and the paragraph for me. I wanted to know if he had skipped due to the influence of his friends but he told me that he skipped by himself, although he did run into some friends later. Based on Aaron's admission that he felt bad for not doing his homework and based on observations I can infer that Aaron cares about school, at least to the extent that he feels guilt over not completing assignments. It is interesting that he didn't seem to feel much guilt for skipping class though, and did not try to make any excuses for himself, or forge a note.

Guilt was not a sufficient motivator for Aaron. At times he could be extremely difficult to motivate and seemed unable to force himself to do things he didn't like doing. I question whether this was because there was no immediate benefit or consequence to his actions or lack thereof. As is the case with many students, while Aaron recognized and understood the long-term consequences of his actions, possibly failing the course, that was not a sufficient motivator. Aaron knew that he was at risk of failing and once he began doing poorly and started skipping things got progressively worse. He didn't seem to be able to stop his steep slide. He told me he knew he could do better but he could not seem to force himself to come to class once his performance declined. I think that he

knew he could do better but it was too much effort to try to raise himself back up so he gave up and planned to do better next time. It was easier for him to imagine a new start and to believe that he would change his ways and do better next time.

Aaron seems to have a fixed view of intelligence based on his performance orientation and his level of effort, reaction to failure, and level of persistence. Aaron did not have a mastery orientation. He was not concerned about learning mathematics for its intrinsic value but because he claimed he wanted to get a high mark. This indicates a performance orientation. When he did try it was because he wanted to get a good mark, but often he did not try. His desire to get a good mark was not strong enough to overcome other distractions. When he began to fail it was the start of a downward spiral. He did not try harder, though he voiced intent to do so. He did not persist with problems he found difficult. Based on his behaviours and actions it is evident that Aaron had an entity view of intelligence (Dweck, 2000).

Using Hannula's (2002) three socio-emotional orientations it is clear that Aaron does not neatly fit into to any one category. He did not do tasks for the challenge or for internal reasons but he didn't always require instructions from others to choose a learning strategy. His motivation was primarily external, that is he did not do a task for the intrinsic value he found in it. He did not strive to master a task but was generally happy to be able to get by. Therefore Aaron did not have a task orientation.

Neither does Aaron fit the mould for the social dependent orientation. He values social relationships, but did not depend on the teacher for success, nor did he seem to crave the approval or attention of authority. He sometimes avoided independent effort, but not because he felt he needed help to be successful. Aaron didn't have high

expectations of success, nor did he expect to do poorly. The fact that Aaron admitted to guilt could imply that he was interested in gaining approval and complying with expectations.

It would not be appropriate to describe Aaron's orientation as ego-defensive as I don't believe he avoided work for any emotional reason or fear of failure. Aaron simply avoided work when he preferred to do something else, that is, when some other activity was attractive enough to overcome what little motivation he had to complete the task at hand.

Aaron best fits into the social-dependent orientation but Hannula's categories don't adequately describe Aaron's motivation. To describe Aaron's motivation it is more appropriate to use Self-Determination Theory (Deci and Ryan, 2000).

According to SDT (Deci and Ryan, 2000) Aaron falls into the categories of extrinsic motivation and amotivation. When he was motivated I would say he falls somewhere between external regulation and introjected regulation. I think Aaron was motivated to do well because he recognizes the importance of mathematics, though he may not have internalized this. He also had some ego-involvement because I feel he knew he was capable of learning the material. He felt guilt which in some instances was sufficient motivation but usually was not. At other times, and much more so near the end of the course, Aaron was amotivated. In essence he had given up and other distractions were much more likely to interest him and take precedence over coming to mathematics class and doing work.

In the second semester Aaron had more internalized the regulation of his behaviour and the value of the mathematics. The first semester he took the course Aaron

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almost seemed amotivated but mostly seemed to dwell in the realm of external regulation.

Over time it appeared he had more internalized his regulation and has moved into the

realm of introjected and identified regulation. It's uncertain how much Aaron values

mathematics, if he sees it as a means to some other goal or whether he genuinely believes

in its importance or is just repeating what he has been told by parents and other teachers.

According to the subcategories of amotivation supplied by Green-Demers et al.

Aaron's amotivation was a factor of his low valuation of academics. He also seemed to

have a deficiency in effort beliefs. He was often unable to force himself to do the work

necessary to succeed. When Aaron was faced with a task he found difficult he tended to

have low persistence, but when he felt successful he could continue to work at it. His

response to a difficult task was not to ask for help but to stop doing it. This was not

because he felt stupid or incompetent but because he did not want to make the effort

necessary to understand it. This information further supports the theory that Aaron had a

deficiency in effort beliefs.

Though he lacked the ability and desire to make the effort, he didn't seem to think

he was incapable of doing the work. This implies he did not have a deficiency in ability

beliefs. The unappealing nature of the tasks no doubt had a factor in Aaron's amotivation

but was not the primary cause for it.

In terms of the didactic contract Aaron felt his portion was to attend class, pay

attention, and follow the notes. He also felt that he should try the homework or at least

appear to be doing so. He did not think he had to ask questions if he had difficulty.

Aaron considered my part of the contract was to let him be for the most part. He did not

reject assistance but if I pushed him too hard his reaction was to skip class.

In summary, Aaron appears to have had a performance orientation to learning linked to his fixed view of intelligence, in addition to a low valuation of academics and a deficiency in effort beliefs which were factors in his amotivation. More than one theory is required to explain Aaron's behaviour.

CHAPTER 4 - RESULTS AND ANALYSIS: SUMMARY

There are some general similarities and differences that can be seen in the participants' behaviour and there are also four larger emergent themes. Exploring these common themes can help to provide a better understanding of student behaviours. The four major themes will be discussed first followed by the minor themes.

One interesting major theme that was discovered was the similarities and differences in students' interpretations of the didactic contract and their levels of complicity. The second major theme that was actually most prevalent is the underlying tension present in each of the four participants' stories. This tension exists between rationality and immediacy. Each participant displayed or verbalized some understanding of what rational actions should be taken to help them to succeed, yet in the heat of the moment made rash or seemingly irrational decisions. Amotivation is a third underlying theme in the stories and has connections to laziness, yet there are shades to it. The laziness is not consistent and not constant.   The fourth and final major theme is on a slightly different level from the first three themes. It is more transferable to other research whereas the first three themes cannot necessarily be generalized to other cases. This is that no single theory could be used to describe any participant's behaviour.

These major and the minor themes were identified through analysis of students' actions, behaviours, statements and responses (verbal and otherwise). Some of the factors used for comparison were: choices of substitute activities, levels of guilt, reasons for absences, degree and type emotional response, type of regulatory behaviour in terms of self-determination theory, theory of intelligence, level of confidence in mathematics and

in general, level of effort, response to requests from the teacher to come in for help, perceived locus of causality (internal versus external), type of motivation (intrinsic versus extrinsic) orientation according to Hannula's (2007) socio-emotional theory, if and how students rationalized behaviour, and coping strategy.

All of these similarities and differences contribute to the larger picture; that is the overall emergent themes. These four themes as aforementioned pertain to the didactic contract, the tension between rationality and immediacy, the notion of laziness or amotivation, and the need to use a combination of the theories.

MAJOR THEMES

Interpretation of the Didactic Contract

As discussed in Chapter 1, humans are expected to be rational creatures. Yet so many of the decisions students make seem to be irrational. Are they not thinking clearly? As rational beings, teachers expect students to do certain things. It could be considered an informal contract between teacher and student. The teacher is expected to teach the lesson, provide notes, provide work for the student to do, answer questions and provide extra help as needed. As for the student, it is expected that they attend class, take notes, do the homework, ask and answer questions, get extra help, and study. This is referred to as the didactic contract. For varying reasons, and with some frequency, this contract is broken by the student. This does not mean the student does not do any of the requirements, nor does it mean that they always do only some of the tasks.

The didactic contract is a very interesting theme. Most of these students probably thought that they were following the didactic contract but each had a slightly different

interpretation of what this contract was. Luke thought that if he came to class he was fulfilling his part of the bargain. He did not feel that he had to take notes, pay attention, or even pretend to do so as he engaged in substitute activities fairly often. Michelle and Aaron felt that they followed the contract if they came to class and appeared to be paying attention and following the notes. They even tried to look busy or engaged with the homework most of the time. Neil didn't even feel like he had to attend class on a daily basis and, as mentioned in Chapter 2, there was no school policy and thus no clearly laid-out consequences that could be invoked. He assumed, or at least was satisfied with, writing the tests and being able to pass the course. When he came to class he was not disruptive so I assume he believed that was a requirement on his part. None of the four felt that part of the contract involved asking questions if they didn't understand something or that getting extra help was expected. However, none of the four refused help when it was offered or pushed on them.

For some reason, students display irrational behaviour, sometimes on a reliable basis. Some students frequently show poor planning or no planning such as scheduling insufficient time to complete a task or not scheduling any time at all, assuming they can "wing" it. Other irrational behaviours include not coming for extra help (when they have been told they need it or are otherwise aware), skipping class, not completing the homework, leaving homework to the last minute (i.e., the last ten minutes of lunch hour), staying up late at night when they know they have difficulty getting up in the morning. Most grade ten students know that they shouldn't be skipping class or staying up late, but many seem unable or unwilling to regulate and change their behaviour. To understand these behaviours it is necessary to understand their goals and the reasons for them.

Tension Between Rationality and Immediacy

The second of the key themes throughout the analysis of the students' behaviours has been the tension between rationality and immediacy. On numerous occasions students stated that they intended to do something or that they knew they had to do "x" in order to achieve "y". Yet the majority of the time "x" was not done and intentions were not carried out. One possible explanation is that students made these statements because they knew that is what they should say and what I wanted to hear but they had no intention of following through. While this can be the case when dealing with students I propose that that is not the situation with these students. Instead I think they believed what they said and had every intention to follow through *in the moment when the intention was stated*. The result of course is that too often the promised action does not occur. So the question that arises is what happens when the time for action comes?

For example, Luke intended to act rationally. He told me that he would come to class, and he believed that he would do so. Yet when the time came there was always something that was more pressing, or more immediate. His friends needed his help or he was tired. Michelle was the same. She had good intentions, and knew rationally that she had to go to class but the immediate interfered. She chose to skip class to spend time with friends or avoid class for other reasons. When it was time for class, other, more immediate, options prevailed. Aaron followed this pattern as well. I don't think he ever planned a day ahead of time to skip class, he intended to come. But when he woke up in the morning he was tired and wanted to sleep in, or he went to school and his friends asked him to go get food with them, or some other immediate option was more attractive. Essentially they made rash or impulse choices when they have to make a decision in the

moment. Neil was similar in some ways, but also different. Sometimes I think he may have intended to come to class, but woke up tired and decided to sleep in. The difference with Neil is that I believe at some times he never had any intention of coming to class.

Another factor contributing to this is that there were no immediate consequences to skipping a class or not paying attention to a lesson. Students may understand the long term repercussions of missing class and not doing homework, but there are few short term consequences to motivate them. If a teacher could say "come to class tomorrow or you fail" and was able to back it up, I believe these students would have attended.

The students were rational in different situations. They could rationalize their behaviour or their poor performance on a test; "I didn't study enough, I was tired so I slept in", but this did not motivate them to change the behaviour. They might have intended to study more next time but when the time came to study they chose to do what gave them immediate gratification rather than make the effort to do schoolwork.

Luke, Aaron, and Michelle could make the commitment to future work because they understood that failure was a consequence and they wanted to avoid it. They fully intended to follow through with the rational behaviour but when the time for action was immediate they made impulse decisions that satisfied more pressing needs such as relatedness, work-avoidance, or more physical needs. This tension between rationality and immediacy has implications for future research.

Laziness and Amotivation

Another recurring theme is laziness. Students weren't lazy all the time, just as they didn't skip class all the time. There are grey areas to laziness. It is inconsistent. If these

students were truly always lazy then they wouldn't ever have come to class or ever done any work during class. Laziness is also inconsistent across subject areas and their overall life. For the most part these students were not lazy in all their classes, sometimes it was just math. Neither were they lazy in all aspects of their lives. Luke was never too lazy to help out his friends, and Michelle never missed meeting her friends for lunch because she was too lazy. Laziness has to do with the amount of effort involved and the amount of satisfaction students get out of the activity. Laziness is a dimension of amotivation and is a term many amotivated students use to describe themselves, even when they are not truly lazy. Laziness is most closely related to a deficiency in effort beliefs. If deficient in effort beliefs a student may be unable to make the effort required for a task. However a student who is deficient in beliefs about the value of academics may not make the effort and consider themselves lazy, but not because they are unable to make the effort but because they don't value the task enough to make the effort. That is not true laziness. A truly lazy student might think, "I won't do the questions I know because I already know them, what's the point in making the effort if I already know how to do it? Or they might do a few just for the personal satisfaction of getting it correct, but this wears off quickly. Questions they know they can't do they don't try because it takes too much effort. Then there are questions they think they know how to do, so either they don't do them because they see it as wasted effort or they try them, can't do them, and give up because it is too much effort. So if a student really is lazy, nothing will ever get done. The interesting point is that there is some rationality to the thinking of these students.

<u>Amotivation</u>

This notion of laziness can be further explored and explained using Green-Demers et al.

four subsets of amotivation. As aforementioned, a student who is deficient in effort

beliefs could display behaviours that might be interpreted as laziness. Neil, Aaron, and

even Luke to some extent displayed a deficiency in effort beliefs. They chose not to do

tasks because they could not or would not make the effort to do them. Of these three,

only Luke also had a deficiency in ability beliefs. Both Aaron and Neil seemed to believe

that they were capable of understanding the material whereas Luke had a low opinion of

his facility with mathematics. Michelle, like Luke, had a deficiency in ability beliefs but

in contrast to the other three participants did not appear to have as much of deficiency in

effort beliefs. Michelle did not seem to have difficulty making an effort to try the

assignments during class time.

The participants also were similar in finding the characteristics of the tasks

assigned to be unappealing. While this was certainly a factor in their amotivation, it was

not the primary factor. In fact, it is more likely that most students in the class found the

tasks to be unappealing.

The last subset of amotivation used to compare the participants is valuation of

academics. Aaron, Michelle, Neil, and Luke all professed a belief that mathematics was

valuable but based on observations it is clear that some of them had not internalized that

belief. It has been shown that parents have the most influence on the valuation students

place on academics (Green-Demers et al., 2006). All of the parents of the participants

seemed to place some value on academics, but it is not clear what the extent of that value

was. Michelle's mother expressed concern for Michelle's performance in school, but

also intimated that school was not always the foremost of her concerns for Michelle.

Neil's mother woke him up every morning (sometimes more than once) to try to get him

to school on time. She is highly involved with his teachers, counsellors, and the vice-

principal, to the extent that she sought outside counselling and testing to discover why he

is amotivated. Luke's mother went so far as to deliver him to class, so it is clear that she

valued the importance of attending school. I did not have much contact with Aaron's

parents but the few times I did phone to discuss his progress they expressed some interest

and concern. Of the four students I know the least about Aaron's home situation. Luke

seemed to place the least value on academics yet his mother seemed to hold one of the

strongest valuations. Neil and Aaron believed in the importance of academics but this

was not a factor in their motivation or amotivation. Michelle's beliefs about the value of

academics are not necessarily aligned with her professed beliefs. It is hard to assess what

her valuations were.

Combination of Theories

No single theory of motivation could be found to adequately describe all of the four

participants, nor even a single one. Cognitive-emotional theory (self-regulation), social-

cognitive theory (self-efficacy), social-emotional theory (learner orientation), and self-

determination theory are all inadequate to explain the motivation of the students. The

four factors of amotivation theory come closest but are still inadequate.

<u>Cognitive-Emotional</u>

Cognitive-emotional theories of motivation primarily discuss self-regulation. These theories focus on students' conscious goal choices and ability to regulate their own behaviour through cognitive strategies. A student chooses a goal and then regulates their behaviour to promote achieving that goal. This theory is not useful with the four participants because they did not have specific goals in mathematics. All four students at some point voiced that they wanted to pass the course and a few made vague goals about getting a certain grade but none of them had any sort of plan or intermediate goals. Even if a participant had a goal which they did not state, he or she was unable to regulate his or her behaviour to reach it. This theory is not appropriate for these four research subjects because they did not have goals pertaining to achievement in mathematics, based on the data I collected.

<u>Social-Cognitive</u>

Social-cognitive theories of motivation are based on self-efficacy. This is essentially the idea that peoples' beliefs about their capabilities will determine how they behave (Pajares & Miller, 1994). Dweck's (2000) work on theories of intelligence falls in this domain. She claims that a person's orientation towards learning and goals stem from their belief that intelligence is either a fixed commodity or an incremental one. People who hold an entity theory would hold performance goals and are concerned with appearing competent. Those who hold intelligence as more malleable will generally hold mastery goals and are focused on understanding. Students who have a fixed view of intelligence can often have a helpless orientation (Dweck, 2002).

This theory is applicable to a few of the participants, some of the time, but is not comprehensive enough to fully explain the avoidance behaviour exhibited. Not one of the participants displayed or voiced a mastery orientation. They were not interested in learning mathematics for the sake of understanding. They also could not be described as primarily having a performance orientation because based on the data I collected they did not have goals related to appearing competent.

Michelle was concerned with not looking dumb but that is not the same as wanting to seem smart. Similarly, Luke and Aaron did not display a need to look competent and did not want to appear dumb, but were not as concerned about it as Michelle. Neil was the most competent of the four participants and might have cared more than the others about appearing so. He didn't want to look dumb but wasn't concerned about it because he didn't think he was. For this reason I think Neil may have a malleable view of intelligence. Michelle, Luke, and Aaron have a fixed view of intelligence.

Social-Emotional

Theories of motivation that have a social-emotional basis have some similarities to social-cognitive theories. Hannula (2006) looks at the learner's orientation but is more concerned with emotions and social needs than beliefs about self-efficacy and intelligence. He discusses three categories of socio-emotional orientations: task-orientation, socially dependent orientation, and ego-defensive orientation.

Michelle was the only student who seemed to have emotional reasons for her behaviours. She clearly fit the description of an ego-defensive orientation. She missed

classes because she wanted to avoid holding herself responsible for the material. She didn't ask questions in class of her peers or of me because she didn't want to appear dumb and because needing the help made her feel dumb. Michelle's primary motivation in mathematics class was self-defense. She felt bad when she didn't understand something and coped by avoiding mathematics class.

None of the boys really fit the description of any of Hannula's (2007) orientation. As aforementioned, none of them had ego-defensive motives. Neither did they fit the description of a socially-dependent orientation. They didn't have high expectations for success based on receiving teacher assistance which is one element of a social-dependence orientation (Hannula, 2007). Another way of describing this is to say that none of the students displayed a helpless orientation. No student in the study had a task-orientation which is characterized by completing a task for its intrinsic value and persistent striving for mastery (Kaasila, 2005).

Because only one student could be adequately described by this theory it is also insufficient to use for analysis. It is possible that it is a gender issue but there is insufficient data to discuss it here.

Self-Determination Theory

Self-determination theory looks at motivation along a continuum. On the far right is intrinsic motivation, characterised by intrinsic regulation. Next is extrinsic motivation which has four categories of regulation: integrated regulation, identified regulation, introjected regulation, and external regulation (from greatest internalization to least

internalization). Lastly, on the far left of the continuum, is amotivation which is

associated with a lack of intention and lack of motivation (Deci & Ryan, 2000).

From a self-determination theory perspective, all four students were either

amotivated or on the left or lower side of the spectrum within extrinsic motivation. More

specifically, their regulation of their behaviour was either external or introjected. None

of the four were intrinsically motivated to do mathematics, and they had a low level of

internalization. Another way of saying this is that they had an external perceived locus of

causality.

The four students fell primarily into the category of amotivation but it is not given

enough consideration in self-determination theory. It is more thoroughly discussed and

explored as a separate entity by another group of researchers.

Amotivation

Green-Demers et al. (2006) expand on the amotivation portion of Ryan and Deci's (2000)

self-determination theory. They discuss four reasons for motivational deficits. The four

subsets of amotivation are: ability beliefs, effort beliefs, academic values, and the

characteristics of school tasks.

It is possible to describe most of the behaviour of all four participants using this

theory. All participants were amotivated to some extent based on the characteristics of

the majority of the tasks they were asked to undertake. As discussed earlier this was a

traditionally-taught mathematics class and while some activities were intended to be

interesting and engaging, the nature of the material was not motivating to the students.

A low valuation of academics was a factor in all four participants' amotivation. None of them believed that academics were entirely unnecessary, but none of them valued it enough to be a motivating factor. Michelle, Luke, Neil, and Aaron all voiced a belief that mathematics was important and necessary, but I don't think their statements coincided with their internalized beliefs. The high number of absences for each participant also indicates that they did not value academics. Their devaluation of mathematics was a factor in their avoidance behaviour.

Only Michelle and Luke displayed or otherwise indicated a deficiency in ability beliefs. Michelle has low perceived confidence and low expectations for her performance in mathematics. Luke stated that he "isn't good at math" and had low expectations for performance. He hoped to pass. Both Aaron and Neil believed they had the ability to do well even though Aaron admitted some material was too hard.

Michelle, unlike the boys, did not display a deficiency in effort beliefs. When she was in class she showed no difficulty in making the effort to do the work. In contrast, Luke, Aaron, and Neil all displayed a large deficiency in effort beliefs. They did not lack the ability to make the effort, but they lacked the desire to do so.

To summarize, the primary factor behind Michelle's avoidance behaviour was her lack of ability beliefs. At heart she did not believe she was capable of doing mathematics. The main factor in the avoidance behaviour displayed by Luke, Aaron, and Neil was their lack of desire to make the effort necessary to succeed.

A number of interesting minor themes were present but are less notable than the four

major themes. These more minor observances were concerned with the students' degree

of introversion and emotional response, absences, level of guilt, note-taking efforts,

substitute behaviours, confidence, coping strategies, and level of caring.

Degree of Introversion

Michelle was the only one of the four students who seemed quiet and shy. Aaron, Neil,

and Luke were all fairly talkative with me or with other students. It was difficult to get

Michelle to open up to me. I believe that she was uncomfortable around most of her

teachers either because they were in positions of authority or because she felt she had

nothing in common with them. Whether talkative or not, none of these students

voluntarily asked questions during class.

Absences

The three boys also had significant numbers of absences but their reasons for missing

class differed from Michelle's. None of them had a self-defense motive. Aaron said he

missed class mostly because he was lazy and couldn't get up in the morning. Luke

missed class because he thought it was more important and more rewarding for him to

help his friends with their personal problems. For Luke, his need for relatedness was

greater than his need for competence in mathematics. Luke also said he missed class

because he was lazy and didn't want to do the work. Neil missed class because he

couldn't get up in the morning and was lazy. Another reason he missed class could be because he didn't see the value in attending. I think he figured he didn't need to come to a lesson to learn the material.

Guilt

Two of the students clearly expressed guilt or obviously felt it. Aaron stated that he missed class because he felt guilty for not completing an assignment. Through observation and analysis I have come to the conclusion that Michelle felt substantial guilt for not attending class, not doing her work, and not understanding the material. In contrast, neither Luke nor Neil ever appeared to have any guilty feelings for poor performance or missing class.

Note-taking Efforts

During class there were similarities in the participants' behaviour. Of the four students, both Michelle and Neil consistently followed the notes during the lesson. Neither of these two was particularly chatty with other students, or at least did not let that distract them from their assigned work. Aaron and Luke were more likely to not have notes. Aaron might write some things down and generally would be paying attention during the lesson. Occasionally he might start doodling in his book. Luke would frequently doodle in his book or read something else during the lesson. Sometimes he would just sleep.

Substitute Behaviours

In addition to being the only one who would consistently not pay attention during notes, Luke was the one student who utilised substitute activities the most. Aaron and Neil would occasionally chat to others or stare off into space but Luke was off-task more often than not. He would read novels or a newspaper, often doodled on his books, would do homework for another class, would sleep, or would stare off into space. Luke would also walk around and chat to other students on the pretext of asking a mathematics question. Using the categorization I created and discussed in Chapter 1 it can be concluded that the substitute activities used by these four students were seldom if ever legitimate.

Confidence

There were both similarities and differences in the students' level of confidence in mathematics and level of confidence overall. Neil, Aaron, and Luke all seemed to show confidence outside of the classroom. They had groups of friends and appeared to be comfortable with peers and have confidence with non-mathematical interests. Michelle gave the impression that she was not very sure of herself both in and out of the classroom, though she was fairly social. Inside the classroom Neil showed confidence and did not seem concerned about asking questions or needing help. Aaron also did not appear concerned, but seemed less confident in his own mathematical skill than Neil was. Luke showed less confidence than Aaron and in fact admitted more than once that he wasn't good at mathematics and was easily confused. Michelle demonstrated the least confidence in her ability. She was uncomfortable asking questions or needing help and was often hesitant to try.

Coping

Michelle chose to cope with her lack of confidence and difficulty with mathematics by avoiding mathematics class. Luke's coping strategy was also to avoid class or avoid paying attention in class, but for reasons that were different from Michelle's. As stated earlier, Michelle avoided class in order to avoid feeling responsible for understanding the mathematics lessons. Luke avoided class because he wanted to avoid effort and because he found other activities such as helping his friends to be more rewarding. Like Luke, when Aaron skipped he was also avoiding the effort he would be required to give in class, and doing something he found more enjoyable, like hanging out with his friends. Neil skipped class mostly because he was lazy and tired. He preferred to sleep and probably figured he could understand the material on his own. Neil also had the highest number of absences, followed closely by Michelle. This is interesting as they seemed to be at the opposite ends of the spectrum with regards to confidence in their ability to do mathematics.

Level of Caring

A final emergent theme is the notion of caring. It would be easy to say that none of the students cared about mathematics. If they truly didn't care about anything they would never have come to class. They all cared about something. It might have been that they cared what their friends, parents, or teachers thought about their behaviour and their performance. Sometimes they might have cared for intrinsic reasons such as personal satisfaction. Again the inconsistency arises. They don't care about everything; they only care about some things, some of the time. Sometimes Michelle, Luke, Neil, and Aaron

cared about fulfilling expectations, and sometimes they didn't. It also depended whose

expectations they were fulfilling. Was it the expectations of their parents that they attend

class or do well? Were they concerned with fulfilling the teacher's expectations that they

make an effort and do their homework? Did their friends expect them to perform at a

certain level? What was expected of someone who cared about being "normal"? This

may tie back to Michelle's concerns about feeling dumb. She cared about what other

people thought of her abilities. Sometimes these students cared about "playing the

game". The game is school and each student had their own interpretation of the game,

akin to their interpretation of the didactic contract.

These emergent themes raise some interesting conclusions and some important

questions to prompt and perhaps guide further research.

CHAPTER 5 - CONCLUSIONS

As a result of this study I have grown as a teacher and as a researcher. In addition I believe I have something to offer to the community of scholarship. The results of the study of the avoidance behaviour of the four participants show that no single reason or group of factors can be used to fully explain avoidance behaviour.

MY GROWTH

As a Teacher

Through my observations of the participants and my discussions with them I believe I have found new insight and improved my teaching practice. By studying students who display avoidance behaviour and analyzing the reasons for it I feel that I am better prepared to meet these types of challenges in my future classes. I believe I will be quicker to recognize students who display this type of behaviour and hopefully will develop the skills to counteract it before it becomes a more serious problem. As yet I do not have a defined plan for doing this, but being able to understand what factors are influencing their avoidance behaviour will help me to devise an action plan for future use. I am more cognizant of the need for early intervention when I notice a student begin to exhibit avoidance behaviour, however I do not yet know what that intervention would look like. In conducting the research I had to think of new ways to get information from students who may not be comfortable talking to or sharing their feelings with authority figures. I learned that in most cases the parents are aware of their child's behaviour but

are at a loss for how to deal with it. I believe I am also more aware and more appreciative of the students who are motivated to do mathematics.

As a Researcher

It is difficult to explain how much I have learned throughout the process of conducting the research and writing this thesis. It is hard to look back at what little I knew of research prior to this experience. From the initial conception of a topic through the application for ethics approval, the identification of the subjects of the research, refining the topic, the actual conduction of the research, searching out and compiling literature, the initial draft and revisions – it has been a great learning experience. I believe I have developed many new skills. In particular, I believe I have become somewhat adept at reviewing a considerable amount of previous research and extracting what is relevant to my study in order to create a comprehensible literature review to provide a foundation upon which to conduct my own research. I have also learned how to analyze my data in conjunction with the literature to come to some sort of conclusions as to the reasons for the observed behaviours. In addition to these two acquired skills I believe I have also improved my writing and learned the protocol for writing a proper research paper which will likely be of use as my career in teaching continues.

No Single Theory

Lastly, I believe that I have made a contribution to this body of research. I have made connections between different theories and I created a categorization of substitute behaviours to help organize and discuss the behaviours. Most importantly, I believe I

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have shown that there is a need for further research on amotivation and avoidance behaviours. Based on the observations and interpretations of student behaviours within this thesis, it is clear that none of the theories discussed can be used alone to adequately explain student motivation. No single theory was capable of explaining the behaviour of all four student participants. Different theories did not lead to contradictions, but did lead to incomplete pictures. In fact, the best analysis of student motivation involved the use of all theories discussed earlier in the paper.

I think that one reason the theories were unable to explain all of the behaviours is the methods by which I collected my data. Much of Dweck's research in social cognitive theory is based on data obtained via questionnaires. As such, this theory may not be useful in analyzing data collected using interview. Hannula conducted his research mostly through case studies and some interview and thus his social emotional theories might not be applicable to analyzing the data that I obtained from discussions with other teachers and parents. Theories that were developed based on one type of data collection may not be useful for analyzing data collected using different methods.

A theory that combines the most useful elements of the current theories needs to be devised. It would need to include factors describing students' needs, emotions, and beliefs to be able to analyze all avoidance behaviour. None of the current theories are able to give a complete picture. Interestingly, these studies seem to be chronological, suggesting that more current research is not separate but has been built on the foundations of previous research. This leads to the belief that further research can only help to explain avoidance behaviour more clearly and to possibly provide ideas for counteracting or preventing amotivation.

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