Erasmus University Rotterdam

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MSc thesis Behavioural Economics

‘An empirical study of the relationship between religious commitment, implicit theories of intelligence achievement emotions, and academic performance in the Netherlands’

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Abstract

Private religious schools seem to perform better than public schools and no waterproof explanation is known yet. Interestingly, the incremental theory of intelligence seems to result into better academic performance. This study is conducted to look at determinants of both academic performance and achievement emotions. Specifically, I conducted a survey to investigate to what extent religious commitment, implicit theories of intelligence, achievement emotions, and academic performance in the Netherlands are related to each other. The survey gathered 135 usable responses. Using Spearman's Rho, Linear Regression, and Structural Equational Modelling religious commitment and the incremental theory of intelligence are found to be associated to academic performance. Also, attending a religious school is associated positively to religious commitment. No evidence is found for a mediator effect of the incremental theory on the relationship between religious commitment and academic performance. A relation is found between positive achievement emotions and both the incremental theory of intelligence and cognitive reappraisal. No evidence is shown for a mediator effect of cognitive reappraisal on the relationship between religious commitment and achievement emotions. The paper thus cannot explain the better performance of religious schools in the Netherlands and does not add new knowledge to the already existing literature regarding the determinants of achievement emotions. Further research is recommended to look for an explanation for the better performance of private, religious schools compared to public ones.

Keywords: Implicit theories of Intelligence, Religious Commitment, Private schools, Cognitive Reappraisal, Achievement Emotions.

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Introduction

In the Netherlands private schools exists next to public schools. Private schools most of the times are faith based and also seem to perform better than their public counterparts. The incremental theory of intelligence and personal religious commitment could be determinants of this better performance and this paper focuses on this possible relationship. Next to that, the paper looks at determinants of achievement emotions.

History of Dutch schooling systems

In 1848, the Dutch constitution was revised and from then on the power of the king was limited, but also freedom of education was established (Akkermans, 1997). Later on, in 1917, after multiple debates between Christian political parties and the socialists and liberals regarding the funding of schools, it was decided that not only public schools but also private schools would be funded by the government in the Netherlands (Akkermans, 1997). This development is known as the *pacification* (Westerman, 2001) and is relevant until now. During the beginning of the 20th century, these developments resulted into the phenomenon of ‘’*pillarization:* the ‘vertical’ division of society in closed social groupings or ‘pillars’ along class and ideological or religious lines, with each pillar having its own social institutions such as newspapers, broadcasting organisations, political parties, trade unions, health insurances, farmers’ associations, banks, schools, hospitals, universities, youth movements and sport clubs’’ (Franken & Vermeer, 2019).

Since then, the Netherlands allowed all kinds of different schools to exist. They should, however, follow some national guidelines to make sure that all education had the same minimum level. While some countries have one main stream in religion, the Netherlands is different in that it is filled with several religious groups (Dijkstra & Peschar, 1996). Another difference with other European countries is the relative number of private (religious) schools, which is much higher compared to other European countries (Franken & Vermeer, 2019). In the 1940’s, for example, about 70 percent of all primary school pupils attended a private school, of which the largest groups were Protestant and Catholic (Dijkstra &

Peschar, 1996). Nowadays most schools in the Netherlands, between 60 and 70 percent, are still private and based on the faith of Christianity or Catholics (Franken & Vermeer, 2019).

Personal faith in the Netherlands

In the Netherlands, as religious schools are allowed to maintain their religion within the school, they can ask from their teachers and students to adhere to a certain religion (Rijksoverheid, 2020). But, even though the majority of schools in the Netherlands is faith-based, the majority of Dutch youngsters do not adhere to the Christian or Catholic belief (Franken & Vermeer, 2019). In the Netherlands, religious affiliation with regard to Catholics decreased from 35% in 1966 to 15% in 2011 and with regard to Christians it decreased from 25% to 10% in the same time period (Vermeer, 2013). The author shows that during these years also the religious belief in a personal God decreased from 47% to 26% in the Netherlands. In 2014-2015, a percentage of 21.1 and 25.1 of the Dutch students attended a Protestant or Catholic secondary school while it was estimated that around 10 percent of the Dutch youngsters and 10 percent of the Catholic youngsters between the age of 15 and 25 were adhering to the respectively Christian and Catholic belief (Van Dijk-Groeneboer, De Koning, Kregting, & Roeland, 2010). Possible explanations for these discrepancies might be that children increasingly stopped sharing the religious beliefs of their parents or that parents may be sending their children to faith-based schools for other reasons than solely the religious character.

Academic achievement in religious schools in the Netherlands

Since the start of the public and private schooling system the performance of both sectors has attracted the attention of public opinion (Het Parool, 2017). In the Netherlands, religious school performance seems to be better than public schools. For example, the news medium RTLnieuws (2018) suggests that (i) in Protestant schools there are less students that need to re-do their year and also (ii) the average grades in these schools are higher. They suggest that these better results are due to the stricter environment in the Protestant schools and also parents agreeing with this environment, re-emphasising it at home.

Implicit theories of intelligence and academic achievement

There are different theories one may hold regarding the nature of intelligence (Dweck, 2006; Blackwell, Trzesniewski, & Dweck, 2007). The first one, the explicit theory, holds the view that one is not able to change some of his or her basic human qualities like ability, personality and intelligence. This fixed mind-set implies that these qualities are static. The second one, the incremental theory, states the opposite: one is in charge of the development of their ability, personality and intelligence. The incremental theory is also called the growth mind-set (Rissanen, Kuusisto, Hanhimäki, & Tirri, 2018). Interestingly, the implicit theories of intelligence have several implications. One of them is that students holding the incremental theory seem to perform better in terms of academic achievement. In this relationship, achievement emotions are determinants of implicit theories of intelligence (King, McInerney, & Watkins, 2012; Romero, Master, Paunesku, Dweck, & Gross, 2014; Claro, Paunesku, & Dweck, 2016).

Implicit theories of intelligence and religion

Following that both religious students and students with the incremental theory of intelligence perform better in terms of academic performance, it might be the case that religious people hold the incremental theory more often than non-religious people. This might be a (partial) explanation of why religious people perform better in school and thus why private schools perform better than public schools. An intuitive reason for this possible explanation is that as religious people believe in God who is infinite powerful and almighty, it is reasonable to expect that they believe God can, next to creating them, change their level of intelligence too. This might lead to religious people holding the incremental theory of intelligence more compared to their non-religious counterparts. Interesting is that both religious commitment and the incremental theory of intelligence seem to be determinants of achievement emotions. Combining this, this research states the following research question:

''What is the relationship between religious commitment, the incremental theory of intelligence achievement emotions, and academic performance in the Netherlands?''

There is no real consensus about the funding of religious schools. While the supporters of religious school funding argue the funding is a necessary act of the government to provide parents with freedom of choice to attend a type of education they want, opponents claim that the dual school system results into growing segregation (Het Parool, 2017). This study may give some new insights and thus inform the ongoing debates about religious, private schools in the Netherlands. Next to that, educational systems might benefit from more knowledge regarding the determinants of academic performance. If the incremental theory of intelligence is related to the performance of private schools, public schools could learn from that and maybe incorporate similar teaching methods or educational systems.

Previously, there has been conducted research which connects implicit theories of intelligence to academic performance (Claro et al., 2016) and research that connects religious commitment and attending a religious school to academic performance (Regnerus, 2000; Jeynes, 2002; 2002a; 2002b, 2012). However, to the best of my knowledge, there has not yet been research that looks at the association between attending a religious school and the incremental theory of intelligence. This paper will not only try to contribute to the existing literature regarding incremental theories of intelligence and academic performance in religious schooling, but also add to the existing knowledge of achievement emotions and its determinants religious commitment and implicit theories of intelligence by testing these links.

After this introduction the paper will provide a theoretical framework in which the different hypotheses will be explained with their corresponding literature. After that, a section regarding the data and methodology used is provided followed by the results and their interpretation and discussion. After the discussion the paper states some limitations and recommendations followed by the conclusion. In the end the appendixes can be found.

For the rest of the paper, three clarifications are introduced. First, even though it would be interesting to also consider Islam and Judaism religions, this study focuses only on Protestant and Catholic religion/schools as they are the biggest groups in the Netherlands. Second, when talking about religious

people the paper implies Christian or Catholic people. Finally, when talking about being religious it means the extent to which someone is personally committed to their religion that is his or her religious commitment.

Theoretical framework

To investigate the research question five hypotheses are formulated of which a part will focus on replication of previous findings and a part will focus on adding new knowledge. The section first presents some definitions. After that, the hypotheses are formulated based upon literature and reasoning. Thirdly, two diagrams of the conceptual framework are provided to summarize the relationships hypothesized.

Definitions

Cognitive reappraisal - Cognitive reappraisal can be defined as the ability of someone to regulate his or her emotions (Vishkin, Bigman, Porat, Solak, Halperin & Tamir, 2016). Antecedent focused strategies are (unconscious) strategies that appear before the emotion response tendencies are fully activated and influence people's response and behaviour (Gross & John, 2003). Cognitive reappraisal is such a strategy by which someone can alter his or her emotional response to a certain situation that would otherwise evoke emotional response. People who are reappraisers thus frequently use an emotion regulation strategy which not only changes how these individuals express themselves towards others but also what and how they feel on the inside.

Religion - Religion is the kind of faith someone adheres to. In this paper the Christian and Catholic faith are meant by religion.

Achievement emotions - Achievement emotions are emotions regarding competence-relevant activities or outcomes (Pekrun, 2006).

Implicit theories of intelligence - As explained in the introduction, implicit theories of intelligence are the different ways in which someone thinks about the malleability of their intelligence. When someone believes that his or her intelligence can be improved or changed, he or she holds the incremental theory

of intelligence. The opposite is the explicit theory of intelligence by which someone believes his or her intelligence cannot change (Dweck, 2006).

Religious commitment - The personal commitment from an individual to his or her religious conviction. In this paper Christianity or Catholicism.

Attending a private school - When talking about attending a private school, this paper indicates attending a Christian or Catholic elementary and/or high school.

Hypothesis formulation

This section elaborates on possible determinants of academic performance and achievement emotions, and consists of two parts. The first part aims to provide justification, based on previous findings and additional reasoning, for a causal relationship between religious commitment and academic performance via the incremental theory of intelligence. The second part aims at providing evidence regarding two determinants of achievement emotions. First, it documents that the incremental theory of intelligence has been shown to be a determinant of achievement emotions. Second, it argues for a causal relationship between religious commitment and achievement emotions via cognitive reappraisal.

Part I: Academic performance

Hypothesis 1: The incremental theory of intelligence and religious commitment

Dweck, Chiu & Hong (1995) explain that implicit theories are important determinants for the worldview one has and how one looks at his or her personality traits. They also show that implicit theories are important in how people judge others and react to them, with incremental theorists being more prone to educate wrongdoers instead of retributing them. This then is an example of how religion may be a

determinant of implicit theories as Christianity/Catholicism teaches to forgive one's enemies and teach them the truth. Further important reasoning is that religion impacts one's thinking about who is in control over everything, including his or her capabilities. Christianity/Catholicism teaches that the God of the Bible Who created the world with everything upon it, including human beings, is in total control of everything in, above, and upon the earth. It proclaims that when the first human beings that were created disobeyed God, all humanity fell into sin and as a result death became part of life. However, the Son of God, Jesus Christ, chose to be born as a human being (being both God and human) and lived a sinless life in total obedience of His heavenly Father. Even, He chose to carry the punishment of sin (eternal death) for every sinner upon earth that believes in Him and listens to His Words by His innocent death on the cross. He also promises that everyone who believes in Him will gain eternal life, will become God's children, and He will change them with help of His Holy Spirit from the inside (desires, characteristics) so that they will be more like Him to give Him His eternal glory.

It is therefore possible to think that people who believe in a God who is in total control of everything and who can change you from the inside might also more often believe that their intelligence is malleable. This current paper argues therefore that religious beliefs are likely to be the core assumptions on which one builds its word view and that they might influence the implicit beliefs one may hold regarding intelligence.

When Dweck et al. (1995) studied determinants of implicit theories of intelligence, they tested whether religion influenced the incremental theory of intelligence one has, but they found no evidence in favour of this hypothesis. However, this paper used religious preference, church attendance and importance of religion as proxies for religion; which not may be fully reflective of the extent to which one is religious. In particular, it could be the case that respondents go to church out of family pressure, have a religious preference but very low commitment to that preference, or think of religion as important but neglect the consequences. Thus, these three proxies can but do not necessarily reveal the extent to which one is personally committed to a religion. This paper therefore proposes to use a more reliable measure, namely one's personal religious commitment, to find out if there is a relationship between being

religious and implicit theories of intelligence. The formulation of the first hypothesis is based upon previous literature and added reasoning, and proposes the following new relationship:

H1: Religious commitment is a predictor of the incremental theory of intelligence.

Hypothesis 2: Religion, the incremental theory of intelligence, and academic performance

Religion and performance

Students performance linked to religion is of interest for researchers. Regnerus (2000) asked if student's involvement with religious activities had any relationship with their academic performance. The answer to this appeared to be yes as he found that participating in religious activities was positively correlated with educational expectations and academic performance in the fields of math and reading. In his research, he also controlled for factors that in other research are correlated to academic performance namely the socioeconomic status of the family, the participation in an academic track, race, and gender. Still, involvement in religious activities and academic achievement was significantly correlated (Regnerus, 2000).

Furthermore, Jeynes (2002; 2002a) studied the effects of students attending religious schools on the academic achievement of those students. His results show that students that attend a religious school outperform students that attend a public, non-religious school. In his studies he controlled for the socioeconomic status and racial factors. Therefore, he could also prove that Black, Hispanic and student with a low socioeconomic status benefit from attending a religious school, as they perform better than their counterparts that do not attend a religious school. This refutes the critique that religious schools attract white students with better socioeconomic status and therefore perform better (Jeynes, 2002b). Some of the explanations provided for the better performance of students in religious schools were:

school atmosphere, racial harmony, the level of school discipline, lower rates of school violence, and the amount of homework that teachers give. However, when these reasons are controlled for, still, students in religious schools outperform the students in non-religious schools (Jeynes, 2002). Using meta-analysis, it is indicated that both religious schooling and religious commitment positively influence academic achievement (Jeynes, 2002; 2012). This paper will try to replicate this finding and therefore states the following hypothesis:

H2a: Religious commitment is a predictor of academic performance.

The incremental theory and performance

Recently, it has been shown, and Claro et al., (2016) claim that this is for the first time, that the implicit theories of intelligence (the growth mind-set) is a strong and reliable predictor of academic achievement. The authors show that there is a robust relationship between students that have the incremental theory of intelligence, thus the belief that their intelligence is malleable, and academic achievement. More precisely, it was found that students with the growth mind-set outperform students that have the explicit theory of intelligence. The research does control for socioeconomic factors. In particular, they state that ‘’for any two students with equal characteristics, the one endorsing a growth mind-set is more likely to enjoy higher academic achievement, suggesting that the benefit of having a growth mind-set holds widely’’ (Claro et al., 2016). Even though with a meta-analysis it has been shown that the positive correlation between an incremental theory of intelligence and academic achievement is weak, it does exist (Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018). This paper will try to replicate this finding and therefore states the following hypothesis:

H2b: The incremental theory of intelligence is a predictor of academic performance.

The incremental theory as a mediator variable

The hypothesis 1 of this paper proposed that religious commitment is a predictor of the incremental theory of intelligence, meaning that someone with higher religious commitment believes more in the

incremental theory of intelligence. Then, hypothesis 2a documents that religious commitment has a positive effect on academic performance. Also, hypothesis 2b documents that the incremental theory of intelligence has a positive effect on academic achievement.

Following the aim to add to the existing explanations of the higher academic achievements of students in religious schools, this paper will then test if religious students perform better in school through the incremental theory of intelligence. Specifically, combining hypotheses H1, H2a, H2b, it is hypothesized that the incremental theory of intelligence is a partial mediator of the relationship between religious commitment and academic achievement. To summarize, based upon previous literature (H2a and H2b) combined with the novel link proposed earlier (H1), this paper proposes the following hypothesis:

> *H2c: Religious commitment is a predictor of academic performance via the incremental theory of intelligence.*

Hypothesis 3: Religious commitment and attending a religious school

Attending a religious school

Religious schools in the Netherlands are not free to teach whatever they like. They are required to follow the requirements that are set by the Dutch government and they also need to comply with the educational standards established in the Netherlands (Franken & Vermeer, 2019). The authors explain that the only way in which private, religious schools in the Netherlands are autonomous is in their religious education. It is not obligated for public schools to include a separate subject regarding religion but they need to inform their students in a neutral and objective way about the major religions that are present in the Dutch society (Westerman, 2001). This results into public schools handling religious education as a side business and not putting much effort into it but gently name it in courses as history or geography (Vermeer, 2013; Franken & Vermeer, 2019).

Faith based private schools however do include religious education as a separate subject in their curriculum and the religious schools are legally allowed to express their school's religious identity; which results into religious education being confessional (Vermeer, 2013). Vermeer (2013) also explains that as the Netherlands promote freedom of persuasion and separation between church and state, religious schools are free in how they fill in their religious education. This means religious education is totally different from any other subject in public and private schools. The government in the Netherlands is connected to the religious education by paying the salaries of the religious education teachers but not with the religious education itself in any way (Vermeer, 2013).

As the introduction of this research suggested that religious schools in the Netherlands perform better than public schools, it might be the case that the degree of religious commitment of the students plays a role in this better academic performance. Hypothesis H2c previously suggested that this effect is expected to be through the incremental theory of intelligence.

Concluding, as religious schools proclaim their belief in the schools through religious education it seems likely that this enhances religious commitment for students in religious schools. And, even though not all students attending a religious school are themselves committed to religion, this research expects that people who are religious committed choose to attend, or let their children attend, a religious school that is in accordance with their beliefs. Therefore, despite the likeliness of it to be less now than in the previous century due to decreasing religious belief in general, this research expects that religious commitment and attending a religious school are positively correlated and therefore states the following exploratory hypothesis:

H3: Attending a religious school is associated positively with religious commitment.

Part II: Achievement emotions

Hypothesis 4: The incremental theory of intelligence and achievement emotions

Implicit theories of intelligence

King, McInerney & Watkins (2012) looked into the association between implicit theories of intelligence and achievement emotions in the academic world. They found that there is a relationship between how students feel in school and how they look at the malleability of their intelligence. Specifically, students with an explicit theory of intelligence experienced less control over the outcomes of an academic task and thus were more likely to feel negative emotions. Students with an incremental theory of intelligence felt more control over their outcomes and in so were 'buffered' against these negative academic emotions.

This research will try to replicate this previous finding; therefore, the following hypothesis is stated:

H4: The incremental theory of intelligence is a determinant of achievement emotions.

Hypothesis 5: Religious commitment, cognitive reappraisal, and achievement emotions

Religion and cognitive reappraisal

In a study regarding cognitive reappraisal and religion, it is hypothesized that religion is, independent of the religious content, linked to effective use of cognitive reappraisal (Vishkin et al., 2016). Through use of both online and real life surveys testing for religiosity and cognitive reappraisal they found a positive association between cognitive reappraisal and religion. In their paper they show that, compared to people who are not religious, people that are religious are better in controlling and regulating the

impact of events on their emotions by changing the meaning of these events, thus using cognitive reappraisal.

H5a: Religion is a predictor of cognitive reappraisal.

Cognitive reappraisal and achievement emotions

Pekrun (2006) described the control-value theory which postulates that cognitive appraisals, consisting of control appraisals and value appraisals, are close determinants of achievement emotions. Elsewhere, achievement emotions are explained as directly linked to achievement activities when in relation to learning and, confirming Pekrun (2006), that cognitive reappraisals are close determinants of achievement emotions (Sorić, Penezić, & Burić, 2013). The mentioned paper explains that relationships of achievement emotions can be complex. Positive achievement emotions as hope and joy most of the times result into positive effects on learning and negative achievement emotions as shame or anxiety mostly result into negative effects on learning. However, this is not always the case as sometimes for example a negative emotion as shame after exam failure can result into the student putting more effort in studying next time and performing better (Turner & Schallert, 2001). When Sorić et al. (2013) conducted a survey among students to examine, among other antecedents of emotions, the relationship between cognitive reappraisal and achievement emotions, they found that cognitive reappraisal makes a significant contribution to the prediction of negative achievement emotions. The study also found a significant influence of gender and age on achievement emotions with male and/or older individuals experiencing more negative emotions compared to female and/or younger individuals.

H5b: Cognitive reappraisal is a predictor of achievement emotions.

Therefore, as previous literature documents that religion is a determinant of cognitive reappraisal (H5a) and that cognitive reappraisal is a determinant of achievement emotions (H5b), this paper proposes the following new hypothesis:

H5c: Religious commitment is a predictor of achievement emotions via cognitive reappraisal.

Conceptual framework

To give the reader an overview of the conceptual framework, the two figures below show the hypothesized relationships. In Figure 1 and Figure 2, the blue circles correspond to the variables and the lines represent the expected associations between the variables.

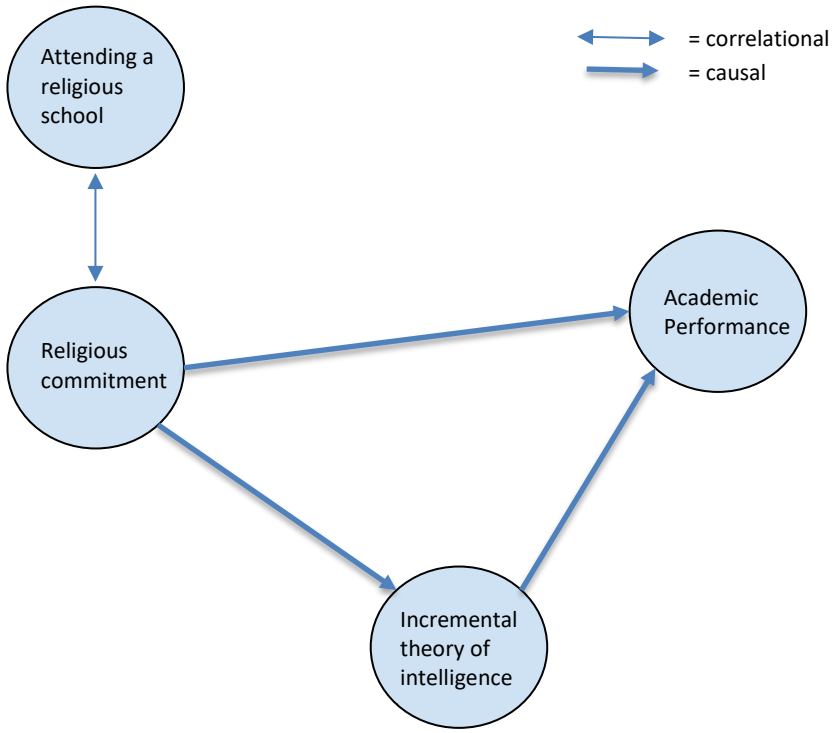

Figure 1. *Expected relationships part I: determinants of Academic performance*

The hypotheses for part I, derived from pervious findings and additional reasoning, that will be tested in this research are the following:

- H1: Religious commitment is a predictor of incremental theory of intelligence.
- H2a: Religious commitment is a predictor of academic performance.
- H2b: The incremental theory of intelligence is a predictor of academic performance.
- H2c: Religious commitment is a predictor of academic performance via the incremental theory of intelligence.
- H3: Attending a religious school is associated positively with religious commitment.

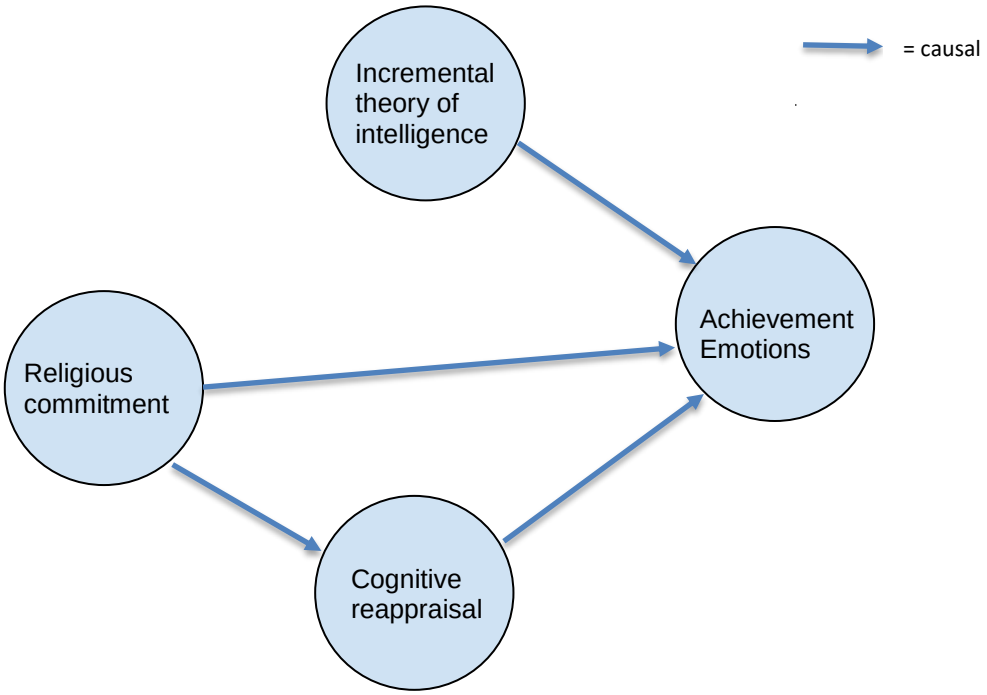

Figure 2. *Expected relationships part II: determinants of Achievement emotions*

The hypotheses for part II, derived from pervious findings and additional reasoning, that will be tested in this research are the following:

- H4: The incremental theory of intelligence is a determinant of achievement emotions.
- H5a: Religion is a predictor of cognitive reappraisal.
- H5b: Cognitive reappraisal is a predictor of achievement emotions.
- H5c: Religious commitment is a predictor of achievement emotions via cognitive reappraisal.

Data and Methodology

Recruitment and participants

The survey is constructed in Qualtrics. To recruit participants the survey was distributed online by use of social media like WhatsApp, Facebook, and LinkedIn. Participants were encouraged to fill in the whole survey with a chance of winning a gift card worth 10€. Before starting the survey participants could read that if they completed the survey they could in the end leave their e-mail address to participate in the lottery. As this paper focuses on the Netherlands the first question asked if the participant went to a Dutch elementary and high school. If yes, the participant could start filling in the rest of the survey. Following this, the survey collected 188 usable responses for the research. As the research focuses on Christian/Catholic participants versus non-religious participants, the three subjects who reported being religious but not Christian or Catholic (Muslim or any other religion) were excluded from the dataset too. Lastly, there were also 50 partial responses from people who did not completely fill out the survey and stopped earlier. To keep the group of participants homogenous in answering the same questions these observations with partial responses were excluded too as the reason for stopping might be a lack of motivation or other important characteristics. As a result, the research will work with a dataset consisting of 135 participants as shown in Figure 2.

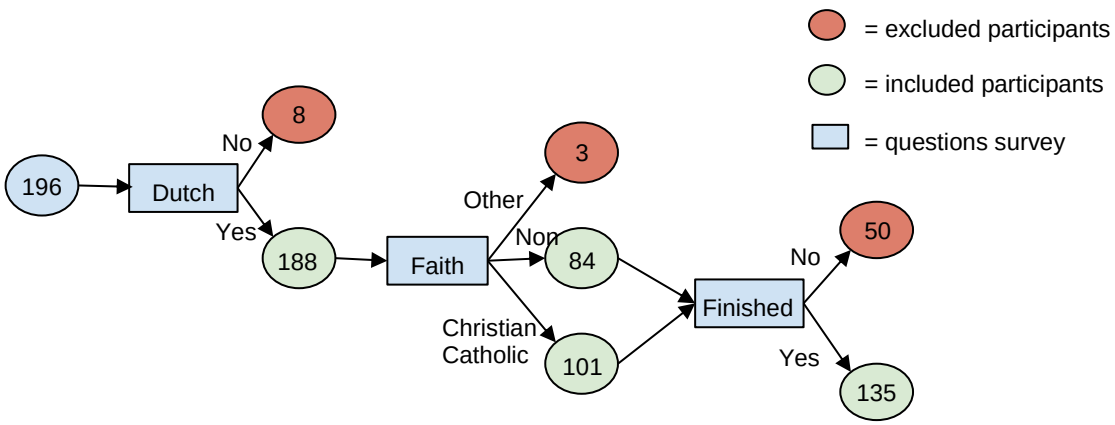

Figure 2. *Sample*

Procedure

Participants completed several questionnaires and answered some demographic questions and some questions regarding information about their school performance, religion and socio-economic status of the family they grew up in. Figure 3 shows the Survey flow. First, the participants were asked if they went to a Dutch elementary and high school. If yes, the participants were able to continue the survey and got some demographic questions asking about their age and gender. Then, the learning-related part of the Achievement Emotions Questionnaire (AEQ) (Pekrun, Goetz, Frenzel, Barchfeld & Perry, 2011) was conducted. This was followed by a multiple choice question asking about which faith the individuals adhere to. If no faith was selected, participants went directly to Dweck's Mindset Instrument (DMI) (Claro et al., 2016) to measure to what extent they hold the incremental theory of intelligence. After the DMI, the participants went on to the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003) which measured one's cognitive reappraisal. If participants did adhere to a certain faith, they first needed to fill in the Religious Commitment Inventory-10 (RCI-10) (Worthington, Wade, Hight, Ripley, McCullough, Berry & O'Connor, 2003). After that, they went on to the ERQ and followed the same steps as non-religious individuals. The next questions asked if and which religion the participants' elementary and high school proclaimed. Also, questions about academic performance at elementary and high school were asked. Performance in elementary school was measured by asking participants how easy it was to pass a year. Performance in high school was measured by asking participants to report their average grade for the final exams in high school, the educational level they attended, and if they had to re-do one or more of the final exams. Lastly, to get a sense of participants' socio-economic status, the survey asked about their parents' job at the time they were young. In the end of the survey participants were free to state their email address to take part in the lottery for the gift cards. The participants were thanked for their participation. In the survey there was no specific reasoning in the order of the questionnaires. The survey is depicted in Appendix A.

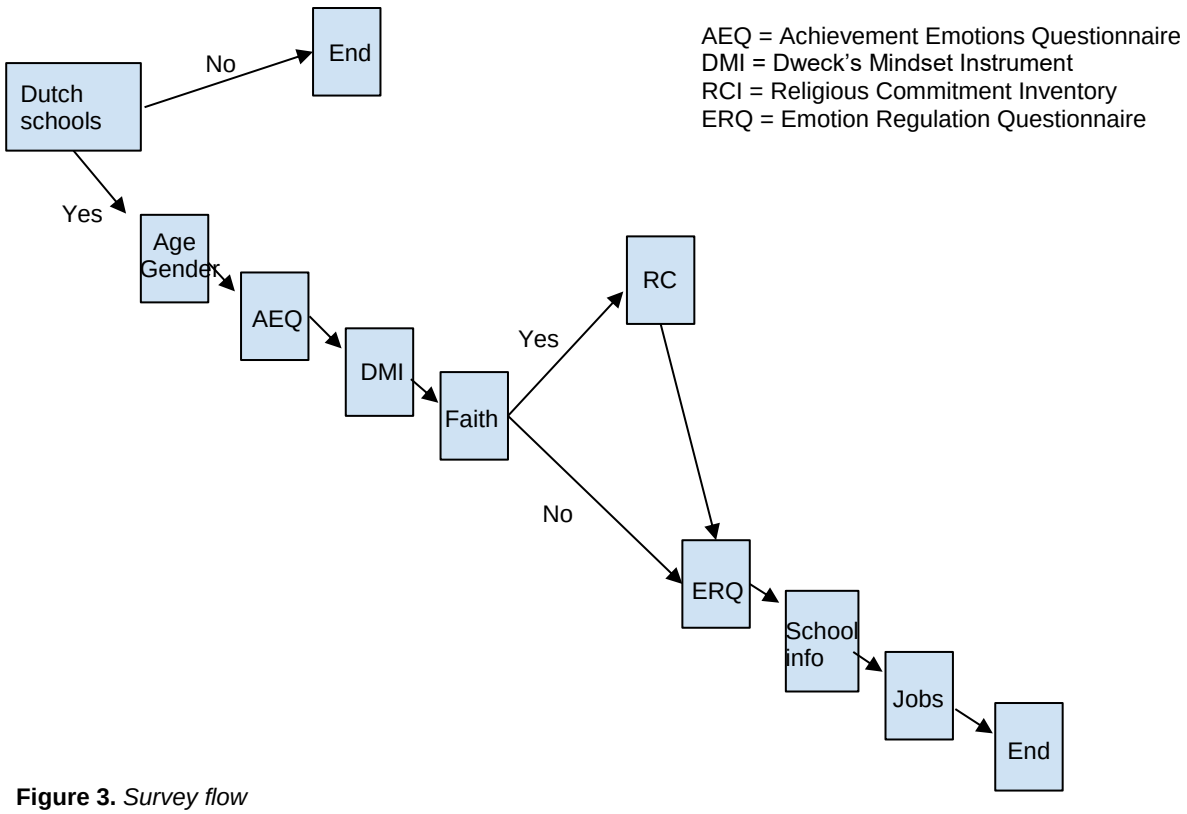

Figure 3. *Survey flow*

Measures

Achievement emotions

To test for someone's achievement emotions the Learning-related part of the Achievement Emotions Questionnaire (Pekrun et al., 2011) is incorporated in the survey. This questionnaire consists of 8 statements about emotions that need to be rated on a 1-6 scale with 1 being 'Strongly Disagree' and 6 being 'Strongly agree'. The statements are in a learning thus academic context. Pekrun et al. (2011) tested the Achievement Emotions Questionnaire (AEQ) in a study with a sample of 389 university students and their findings indicated that the questionnaire is reliable and both internally and externally valid when associated with cognitive reappraisal, learning, and academic performance. The emotions tested are documented frequently in students' learning behaviour and contain positive and negative emotions. The emotions assessed are categorized by the authors into a positive and negative category with enjoyment, hope, and pride being positive emotions and anger, anxiety, shame, hopelessness, and boredom being the negative emotions.

This research follows the authors in distinguishing between positive and negative achievement emotions and thus the Learning-related part of the AEQ is used to create two variables. Positive achievement emotions (PAE) and Negative achievement emotions (NAE). The questionnaire consists of three statements regarding the positive emotions and four statements regarding the negative emotions. For PAE and NAE the scores, being 1 until 6, per statement are added up whereby the higher the scores, the more the individual experiences the positive or negative achievement emotions.

Implicit theories of intelligence

To get information about what theory of intelligence people hold, the research will use a short version of Dweck's Mindset Instrument (DMI) (Claro et al., 2016; Dweck, 2006). The DMI consists of eight statements regarding the malleability of one's intelligence that need to be rated on a 1-6 scale with 1 being 'Strongly Disagree' and 6 being 'Strongly Agree'.

With Dweck's Mindset Instrument, the statements either are positively or negatively stated regarding the incremental theory of intelligence. The scores for the negatively stated statements therefore are reversed with 6 being 1, 5 being 2 and so on. Then, the scores per statement are added up to give one final score for the incremental theory (Incremental) per participant with the higher the scores, the more the participant is convinced from the incremental theory.

Religious commitment

To get information about one's religious commitment the paper will incorporate the Religious Commitment Inventory-10 (RCI-10) test (Worthington et al., 2003) in the survey. The authors base their RCI-10 test on earlier religious commitment inventory questionnaires that used 62, 20, and 17 items (McCollough & Worthington, 1995; Morrow, Worthington, & McCullough, 1993; McCullough, Worthington, Maxey, & Rachal, 1997). They wanted to shorten and refine the RCI-17 and used six studies to present evidence of the reliability and validity of the RCI-10 test. They state that the RCI-10 is particularly useful for Christians but also that it can be used with other religious groups to measure one's religious commitment. The questionnaire states ten questions regarding religious commitment

that people need to self-report. The questions need to be answered on a 1-5 scale with 1 being 'Not at all true of me' and 5 being 'Totally true of me'.

The RCI-10 is a quite straightforward questionnaire and is only filled out by participants that self-report to be religious. The ten statements are all positively stated regarding religious commitment and ask how true the statement is on a 1-5 Likert-scale. The scores for all the statements are added up to get one final score for the participant's religious commitment (RC) whereby the higher the score, the more religious committed someone is. To be able to conduct all statistical tests with the same subject group non-religious individuals get a value zero for religious commitment. This will make it possible to use the same subject group for tests including the religious commitment variable as otherwise the non-religious subjects will get a missing value for this questionnaire in STATA and be excluded from the statistical tests.

Cognitive reappraisal

To get information about one's cognitive reappraisal the research will conduct the cognitive reappraisal part of the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003). This questionnaire consists of six statements regarding someone's emotion regulation that need to be answered on a 1-6 scale with 1 being 'strongly disagree' and 6 being 'strongly agree'. The authors derived the six items of the questionnaire based upon their own knowledge and reasoning and used it in their five studies. The ERQ focuses on reappraisal of positive and negative emotions in general, so there are no specific emotions mentioned in the questionnaire as the authors show that such a focus has been proven to be extremely effective in previous literature on emotion experience.

The seven statements from the ERQ are all positively stated and therefore all scores are added up to get a final value for someone's cognitive reappraisal (CR) with the higher the score, the more reappraisal the participant applies in his or her thinking.

Socio-Economic Status

As the socio-economic status of students is a predictor of performance (King, McInerney, & Watkins, 2012) it is included as a control variable in this research. To get information about the SES the survey asked for the job of participant's parents. The answers to these questions provide information about the socio-economic status of the participants. With the provided jobs an indication about the socio-economic status is estimated. This is done with use of the occupational (=socio-economic) status levels from Lin, Ensel & Vaughn (1981). They divided people into seven classes of socio-economic status levels which can be seen in figure 4. The levels are both depending on salary and responsibilities and therefore give a better estimate then when only looking at salary. Scores for both the job of the father and the mother are added up and this gives one final score for socio-economic status (SES) from each participant.

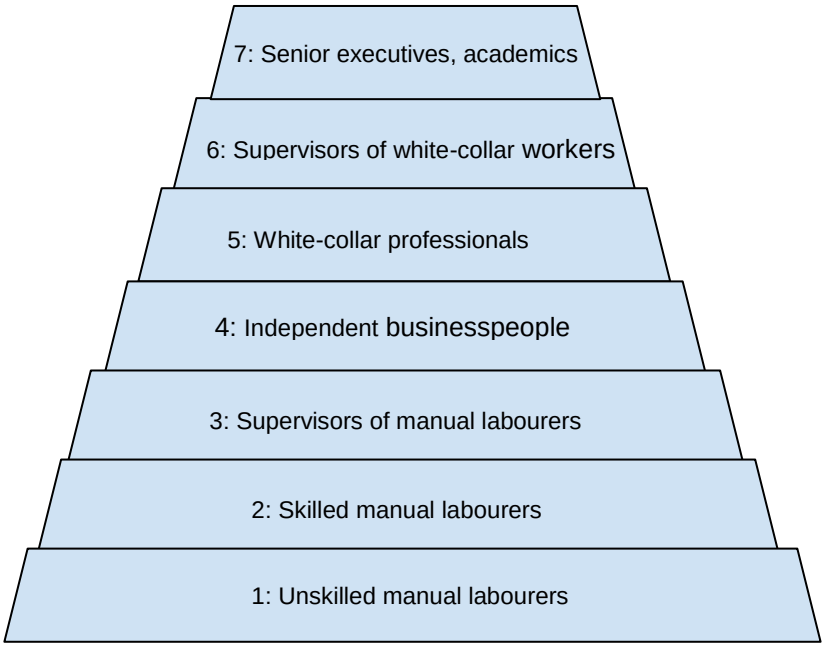

Figure 4. *Socio-economic status levels*

Categorical variables

For the variables age (Age), elementary school performance (ES_p), high school level (HS_l) and high school grade (HS_g) the data is categorical with each answer option being a category whereby the lowest category displays the lowest age, performance, level, and grade and the highest category displays the highest value for the same variables.

Dichotomous categorical variables

As the research focuses on Christian and Catholic schools versus non-Christian and non-Catholic schools, the variable for the religion of both the elementary and high school were transformed into a binary (=dichotomous categorical) variable where value 0 is Non and value 1 is Christian/Catholic. The same procedure was performed with the variable for personal faith. Other binary variables will be Gender (Gender) (0=male, 1=female), faith of elementary school (ES_f) (Non=0, Christian/Catholic=1), faith of high school (HS_f) (Non=0, Christian/Catholic=1), and taking a resit for high school final exams (HS_r) (yes=0, no=1).

Analytic plan

Correlations

To report the correlations between the variables named in each hypothesis, Spearman's Rho will be conducted. As the Spearman's Rho is a non-parametric test that works with ranked variables, there is no need for normally distributed data. Spearman's Rho is a test that can be used to measure the strength of the association between the variables of interest.

Regressions

For H1, H2a, H2b, H4, H5a, and H5b, linear regressions are performed. In each regression the variables "Age", "Gender", and "SES" are added as control variables in line with previous literatures:

$$Y_i = \beta_0 + \beta_1 * X_1 + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

Whereby Y and X vary for each hypothesis giving the following regressions for each hypothesis:

H1: Religious commitment is a predictor of incremental theory of intelligence.

Gives

$$Incremental = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

H2a: Religious commitment is a predictor of academic performance.

Gives

$$ES\_p = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_l = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_g = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_r = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

H2b: The incremental theory of intelligence is a predictor of academic performance.

Gives

$$ES\_p = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_l = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_g = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$HS\_r = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

H4: The incremental theory of intelligence is a determinant of achievement emotions.

Gives

$$PAE = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$NAE = \beta_0 + \beta_1 * Incremental + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

H5a: Religion is a predictor of cognitive reappraisal.

Gives

$$CR = \beta_0 + \beta_1 * RC + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

H5b: Cognitive reappraisal is a predictor of achievement emotions.

Gives

$$PAE = \beta_0 + \beta_1 * CR + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

$$NAE = \beta_0 + \beta_1 * CR + \beta_2 * Age + \beta_3 * Gender + \beta_4 * SES + \varepsilon$$

With “PAE“ = Positive achievement emotions, “NAE“ = Negative achievement emotions, “Incremental“ = Incremental theory of intelligence, “CR“ = Cognitive reappraisal, “ES_f“ = elementary school faith, “ES_p“ = Elementary school performance, “HS_f“ = High school faith, “HS_l“ = High school level, “HS_g“ = High school grade, “HS_r“ = High school re-do, “SES“ = Socio-economic status, and “RC“ = Religious commitment. As mentioned before, positive and negative achievement emotions are two different variables in line of previous literature.

Mediation analysis

For the tested relationship through the mediator variable in H2c and H5c the research will make use of Structural Equation Modelling (SEM). SEM is a statistical method that allows for path and mediator analysis by use of the maximum likelihood estimation. A mediator variable is a variable through which the independent variable has an effect on the dependent variable. When there exists only an effect through the mediator variable and there is no direct effect from the independent variable on the dependent variable, there is full mediation. When there exists next to the mediator effect a direct

effect from the independent variable on the dependent variable, the mediation is partly. The maximum likelihood estimation used by SEM is “a method for estimating population parameters from sample data such that the probability (likelihood) of obtaining the observed data is maximized.” (Singla, 2018). One big advantage of the maximum likelihood estimation is that it can estimate parameters correctly when the data is not normally distributed. The chi2 goodness of fit test gives information about how well the model is fitted. The null hypothesis of the chi2 test is that the predicted model and the observed data are the same. When the p-value is not significant at the 5% level the null-hypothesis that the model is well fitted cannot be rejected. The SEM model then fits the data well. In the SEM model, latent variables can be incorporated. A latent variable is an unobserved variable that is built from observed variables. For academic performance a latent variable will be built depending on the observed variables of elementary school performance, high school level, high school grade, and high school re-do.

Results

Descriptive statistics correlations, regressions, and mediation analysis will be discussed.

Descriptive statistics

Table 1, table 2, and table 3 show descriptive statistics from the participant group.

Table 1. *Demographics*

	Age						
Gender	16-19	20-25	26-35	36-45	46-55	>55	Total
Male	4	26	15	6	4	2	57
Female	7	48	14	4	3	2	78
Total	11	74	29	10	7	4	135

Table 1 shows that 57 males and 78 females participated in the survey. This could impact the results a bit regarding emotions as females may experience more emotions than males. Therefore, gender will be controlled for. Even though the numbers for 16-19 and 45 and above are not that big, every age group is represented except for <15. The group of 20-25 years of age is the biggest group with 74 participants belonging to it. To control for differences in outcome due to age effects, age will be added to the regressions as control variable.

Table 2. *Division Christian/Catholic vs. Non*

	Religion		
	Christian/Catholic	Non	Total
Personal faith	95	40	135
Elementary school	117	18	135
High school	112	23	135

Table 2 shows the division between participants regarding adhering to a religion or not and attendance of a private or public elementary and high school. From the 135 participants, 95 are personal committed to a religion. Remarkable is that the number of subjects with a personal faith is about 20 individuals lower than the number of subjects that attended a religious elementary and/or high school. This shows that not all people that attend a religious school are religious committed themselves as is discussed previously in this paper.

Table 3. *Descriptive statistics results*

Variable	Mean	Std. Dev.	Min.	Max.
Gender	0.578	0.496	0	1
Age	2.556	1.111	1	6
Positive Achievement Emotions	14.674	1.988	8	18
Negative Achievement Emotions	11.667	4.642	5	27
Incremental theory	29.133	7.848	9	48
Religious Commitment	23.081	17.629	0	50
Faith	0.704	0.458	0	1
Cognitive Reappraisal	24.600	4.294	13	36
Elementary School faith	0.867	0.341	0	1
Elementary School performance	1.178	0.609	1	4
High School faith	0.830	0.377	0	1
High School level	3.481	0.721	1	4
High School grade	2.644	0.777	1	5
High School re-do	0.970	0.170	0	1
Socio-economic Status	7.570	2.861	2	13

Table 3 displays the descriptive statistics mean, standard deviation, minimum, and maximum for the results of all variables. Each variable got 135 observations. Important to realize is that the variables consist of ranked data and thus the numbers cannot be interpreted as absolute values e.g. Age of 6 depicts age category 6 (being >55) instead of 6 years of age. Almost all variables reach the maximum score possible. The only one who does not reach its maximum score (30) is negative achievement emotions of which a maximum score of 28 reached. Minimum and maximum scores for each variable differ, indicating that the survey managed to gather responses that are representative for the different views and characteristics of people. The scores for socio-economic status got a minimum of 2 and a

maximum of 13 with a mean of 7.570, which is quite high. This indicates that relatively more subjects grew up in a family with a socio-economic status that is quite high. To account for this, the research controlled for socio-economic status in the statistical testing. As the research conducts no experiments, mean and standard deviation information from the variables cannot be compared to information from other treatments to gain any additional insights.

Correlations

For all the variables measured correlational tests are conducted with Spearman's Rho. Results are depicted Appendix B. The correlations that are specifically interesting for the hypotheses are discussed.

Hypothesis 1: Religious commitment and the incremental theory

The first hypothesis looks at the relationship between religious commitment and the incremental theory of intelligence. The correlation coefficient for this relationship is 0.073 (p=0.399).

Hypothesis 2: Religious commitment, academic performance, and the incremental theory

Hypothesis 2a states that religious commitment is a predictor of academic performance. The correlation coefficient for the relationship between religious commitment and elementary school performance, high school level, high school grade, and high school re-do are respectively -0.114 (p=0.187), 0.103 (p=0.234), 0.127 (p=0.012), and 0.028 (p=0.749). For hypothesis 2b the correlations between the incremental theory of intelligence and academic performance are of interest. The correlation coefficients between the incremental theory and elementary school performance, high school level, high school grade, and high school re-do are respectively 0.052 (p=0.550), -0.097 (p=0.261), -0.033 (p=0.709), and -0.237 (p=0.006). Hypothesis 2c combines H1, H2a, and H2b and thus no further relationships for that need to be discussed.

Hypothesis 3: A religious school and religious commitment

The relationship between attending a religious school and personal religious commitment is of interest for the third hypothesis. The correlation coefficients between religious commitment and attending a religious elementary school and a religious high school are respectively 0.370 (p=0.000) and 0.465 (p=0.000).

To conclude, hypothesis 3 states that attending a religious school is associated with religious commitment. For this hypothesis positive significant results are found for both attending a religious elementary school and attending a religious high school. Therefore, hypothesis 3 is accepted.

Hypothesis 4: The incremental theory and achievement emotions

Then the fourth hypothesis, the incremental theory of intelligence results into more achievement emotions, is reported in terms of correlations. The correlation coefficients of the relationship between the incremental theory and both positive achievement emotions and negative achievement emotions are respectively 0.202 (p=0.019) and -0.234 (p=0.006).

Hypothesis 5: Religious commitment, achievement emotions, and cognitive reappraisal

H5a looks at the relationship between religious commitment and cognitive reappraisal. The correlation coefficient between religious commitment and cognitive reappraisal is 0.067 (p=0.442). H5b proposes that cognitive reappraisal is a predictor of achievement emotions. The correlation coefficients between cognitive reappraisal and both positive achievement emotions and negative achievement emotions are respectively 0.206 (p=0.017) and -0.701 (p=0.416). Lastly, H5c, Stating that religious commitment results into achievement emotions via cognitive reappraisal, looks at the relationship between religious commitment and achievement emotions itself too. The correlation coefficients of the relation between religious commitment and both positive achievement emotions and negative achievement emotions are respectively -0.103 (p=0.237) and -0.044 (p=0.614).

Regressions

Performing the Skewness and Kurtosis test gives information about the normality of the data. The test shows that only the variables for the incremental theory of intelligence, cognitive reappraisal and high school grade are normally distributed (See Appendix C for the results of the Skewness Kurtosis test). Therefore, robust errors are used in the regressions. Regression coefficients are shown and discussed below. For full regression results, including standard errors, t-test, and confidence intervals, one may look in Appendix D.

Hypothesis 1: Religious commitment and the incremental theory of intelligence

The first hypothesis states that the religious commitment is a predictor for the incremental theory of intelligence. The regression coefficient, when controlling for age, gender, and socio-economic status, for the effect of "RC" on "Incremental" is 0.020 (p=0.643). The F-test shows a non-significant result at the 5% level and thus shows that the model is not fitting well. Table 4 shows the regression results, including the control variables, for hypothesis 1.

Table 4. *Coefficients regression analysis H1*

	Incremental (F = 0.883)
RC	0.020
Age	-0.081
Gender	0.916
SES	-0.012
Constant	28.433***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01*

To conclude for hypothesis 1, religious commitment is a predictor of the incremental theory of intelligence, results show no significant effect and thus hypothesis 1 cannot be accepted.

Hypothesis 2: Religious commitment, academic performance, and the incremental theory

Hypothesis 2a states that religious commitment is a predictor of academic performance. First, the regression with dependent variable "ES_p" shows a coefficient for "RC" of -0.007 (p=0.277). The F-test shows that the model does not fit well (p>0.05). Then, the regression with dependent variable "HS_l" shows a coefficient for "RC" of 0.002 (p=0.639). The F-test shows the model fits well (p<0.05). Third, the regression with dependent variable "HS_g" shows a coefficient for "RC" of 0.008 (p=0.038) The F-test shows this model does not fit well (p>0.05). Last, the regression with dependent variable "HS_r" shows a coefficient for "RC" of -0.0001 (p=0.918). The F-test shows the model does not fit well (p>0.05). Table 5 shows the regression results for hypothesis 2a, including the coefficients for the control variables "Age", "Gender", and "SES".

Table 5. Coefficients r*egression analysis H2a*

	ES_p (F=0.745)	**HS_l (F=0.000)**	**HS_g (F=0.156)**	**HS_r (F=0.412)**
RC	-0.004	0.002	0.007**	-0.0001
Age	-0.039	-0.130**	-0.012	-0.013
Gender	-0.046	-0.211*	0.074	-0.027
SES	-0.017	0.075***	-0.022	0.009
Constant	1.512***	3.330***	2.625***	0.951***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01. ES_p=Elementary school performance, HS_l=High school level, HS_g=High school grade, HS_r=High school re-do.*

To conclude for hypothesis 2a, religious commitment is a predictor of academic performance, results show that even though there is no significant effect of religious commitment on elementary school performance, high school level and high school re-do, there is an effect of religious commitment on high school grade. Even though this effect is small, still hypothesis 2a is accepted.

Hypothesis 2b states that the incremental theory of intelligence is a predictor of academic performance. Firstly, the regression with dependent variable "ES_p" shows a coefficient for "Incremental" of 0.005 (p=0.488. The F-test shows that the model does not fit well (p>0.05). Then, the second regression with dependent variable "HS_l" shows a coefficient for "Incremental" of -0.012 (p=0.100. The F-test shows

the model fits well (p<0.05). Third, the regression with dependent variable "HS_g" shows a coefficient for "Incremental" of -0.004 (p=0.613). The F-test shows the model does not fit well (p>0.05). Lastly, the regression with dependent variable "HS_r" shows a coefficient for "Incremental" of -0.005 (p=0.048). The F-test shows the model does not fit well (p>0.05). Table 6 shows the regression results for hypothesis 2b, including the coefficients for the control variables "Age", "Gender", and "SES".

Concluded, hypothesis 2b states that the incremental theory of intelligence is a predictor of academic performance. No significant effects are found for elementary school performance, high school level, and high school grade. A small effect is found for the effect of the incremental theory of intelligence on high school re-do. Even though this effect is in a negative direction, still it is an effect. Therefore, hypothesis 2b is accepted.

Table 6. Coefficients r*egression analysis H2b*

	ES_p (F=0.826)	**HS_l (F=0.000)**	**HS_g (F=0.701)**	**HS_r (F=0.354)**
Incremental	0.005	-0.012	-0.004	-0.005**
Age	-0.022	-0.138**	-0.045	-0.014
Gender	-0.065	-0.193	0.108	-0.023
SES	-0.017	0.075***	-0.021	0.010
Constant	1.264***	3.719***	2.981***	1.098***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01. ES_p=Elementary school performance, HS_l=High school level, HS_g=High school grade, HS_r=High school re-do.*

Hypothesis 4: The incremental theory and achievement emotions

Hypothesis 4 tests if the incremental theory of intelligence is a predictor for achievement emotions. First, the regression with dependent variable "PAE" shows a regression coefficient for the independent variable "Incremental" of 0.069 (p=0.002). The F-test shows that the model fits well (p<0.05). Then, for the regression with dependent variable "NAE" the regression coefficient for the independent variable "Incremental" is -0.173 (p=0.002). The F-test shows that the model fits well (p<0.05). Table 7 shows the regression results for hypothesis 4 including the coefficients of the control variables.

Table 7. *Coefficients regression analysis H4*

	PAE (F=0.006)	NAE (F=0.019)
Incremental	0.069***	-0.173***
Age	0.0133	0.022
Gender	0.207	-0.667
SES	0.081	-0.098
Constant	11.575***	17.769***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01. PAE=positive achievement emotions, NAE=negative achievement emotions.*

To conclude, hypothesis 4 states that the incremental theory of intelligence is a predictor of achievement emotions. Results show that a positive effect is found for positive achievement emotions and a negative effect is found for negative achievement emotions. Thus, hypothesis 4 is accepted.

Hypothesis 5: Religious commitment, achievement emotions, and cognitive reappraisal

Hypothesis 5a states that religious commitment is a predictor of cognitive reappraisal. The regression coefficient for the effect of "RC" on "CR" has a value of 0.004 (p=0.845). The F-test shows that the model does not fit well (p>0.05). Table 8 shows the regression results for hypothesis 5a including the control variables.

Table 8. Coefficients *regression analysis H5a*

	Cognitive Reappraisal (F = 0.644)
RC	0.004
Age	0.109
Gender	1.037
SES	-0.058
Constant	24.066***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01*

Concluded, no significant results are found for hypothesis 5a, religious commitment is a predictor of cognitive reappraisal, and thus hypothesis 5a is not accepted.

Hypothesis 5b states that cognitive reappraisal is a predictor of achievement emotions. The regression coefficient for the effect of "CR" on "PAE" is 0.104 (p=0.008). The F-test shows that the model fits well (p<0.05). For the regression with the dependent variable "NAE" the coefficient of "CR" is -0.099 (p=0.237). The F-test shows that the model does not fit well (p<0.05). Table 9 shows the regression results for hypothesis 5b including the coefficients of the control variables.

Table 9. *Coefficients regression analysis H5b*

	PAE (F=0.017)	**NAE (F=0.542)**
CR	0.104***	-0.099
Age	0.112	0.060
Gender	0.167	-0.734
SES	0.087*	-0.102
Constant	11.083***	15.140***

*Notes: * = pvalue<0.1; ** = pvalue<0.05; *** = pvalue <0.01. PAE=positive achievement emotions, NAE=negative achievement emotions.*

To conclude for hypothesis 5b, which states that cognitive reappraisal is a predictor of achievement emotions, no effect is found for negative achievement emotions but a positive effect is found for positive achievement emotions. This means that hypothesis 5b is accepted.

Structural Equational Modelling

Hypothesis 2: Religious commitment, academic performance, and the incremental theory

Hypothesis 2c states that religious commitment is a predictor of academic performance via the incremental theory of intelligence. To test this hypothesis this paper will make use of Structural Equational Modelling (SEM) whereby academic performance is the dependent variable, religious commitment is the independent variable and the incremental theory of intelligence is the mediator variable. Figure 5 shows the results of the mediation analysis conducted with SEM. As there are a bit much variables for academic performance (4), academic performance is a latent variable in the model.

The latent variable academic performance is the unobserved variable derived from the observed variables for elementary school performance, high school level, high school grade, and high school re-do. Standardized coefficients are reported which are the coefficients when the variances of the dependent and independent variables are 1. Figure 5 shows that "Incremental" is a partial mediator for the relationship between religious commitment and academic performance. This can be seen from the provided coefficient between "Religious commitment" and "Academic Performance", if the mediation would account for the full effect the coefficient that now is -0.198 (p=0.084) would then have been zero.

The coefficients provided by the SEM model for the direct effect of religious commitment on the incremental theory, for the direct effect of the incremental theory on academic performance, and for the direct effect of religious commitment on performance have coefficients of respectively 0.073 p=(0.392), 0.174 (p=0.129), and -0.198 (p=0.084). The indirect effect of religious commitment on the incremental theory on academic performance then is 0.073*0.174. The total effect of religious commitment on academic performance can be calculated as -0.198+(0.073*0.174) and gives a total effect of -0.185. As the direct effects do not all show statistical significance this total effect is not statistically significant.

The regression coefficients in the latent variable for elementary school performance, high school level, high school grade, and high school re-do are respectively 0.589 (p=0.000), 0.649 (p=000), -0.081 (p=504), and -0.204 (p=0.073). Performing the Chi2 test with the null-hypothesis "The predicted model and the observed data are the same" results into a non-statistical significant p-value of 0.081. This means the null-hypothesis cannot be rejected at the 5% level and the model fits the data well. The full results including coefficients, standard errors, z-score, and confidence interval, of the SEM model can be seen in Table E1 in Appendix E.

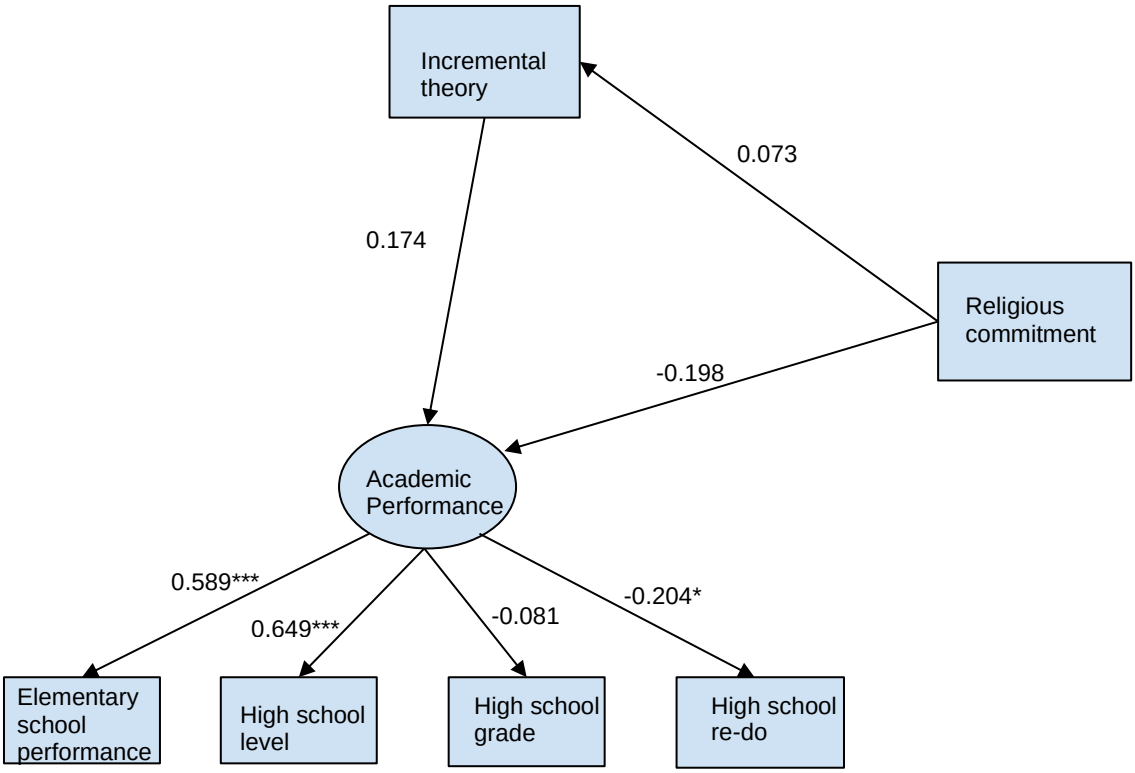

Figure 5. *SEM analysis H2c, * = pvalue<0.1, ** = pvalue<0.05, *** = pvalue <0.01*

Concluded, for hypothesis 2c, religious commitment is a predictor of academic performance through the incremental theory of intelligence, no significant effects are found. This results into no acceptation of hypothesis 2c.

Hypothesis 5: Religious commitment, achievement emotions, and cognitive reappraisal

Hypothesis 5c states that religious commitment is a predictor of achievement emotions via cognitive reappraisal. To test this hypothesis the paper will make use again of Structural Equational Modelling (SEM) whereby achievement emotions is the dependent variable, religious commitment is the independent variable and the incremental theory of intelligence is the mediator variable. Figure 6 shows the results of the mediation analysis conducted with SEM. Standardized coefficients are reported which are the coefficients when the variances of the dependent and independent variables are 1. There are only two variables for achievement emotions so there is no need to build a latent variable. Figure 6 shows that cognitive reappraisal is a partial mediator for the relationship between religious commitment and

achievement emotions. This can be seen from the provided coefficients for the direct effect of religious commitment on both positive achievement emotions and negative achievement emotions. If the mediation would account for the full effect these coefficients, being respectively -0.117 (p=0.159) and -0.039 (p=0.648), would have been zero.

The coefficient for the direct effect of religious commitment on cognitive reappraisal is 0.067 (p=0.436). The coefficients for the direct effect of cognitive reappraisal on both positive achievement emotions and negative achievement emotions are respectively 0.213 (p=0.009) and -0.068 (p=0.428). The coefficients for the direct effect of religious on both positive achievement emotions and negative achievement emotions are respectively -0.117 (p=0.159) and -0.039 (p=0.648). The indirect effect of religious commitment on cognitive reappraisal on positive achievement emotions then is 0.067*0.213. The total effect of religious commitment on positive achievement emotions can be calculated as -0.117+(0.067*0.213) and gives a total effect of 0.163. As the direct effects do not all show statistical significance this total effect is not statistically significant. The indirect effect of religious commitment on cognitive reappraisal on negative achievement emotions then is 0.067*-0.068. The total effect of religious commitment on negative achievement emotions can be calculated as -0.039+(0.067*-0.068) and gives a total effect of -0.044. As the direct effects do not all show statistical significance this total effect is not statistically significant.

Performing the Chi2 test with the null-hypothesis “The predicted model and the observed data are the same” results into a non-statistical significant p-value of 0.004. This means the null-hypothesis has to be rejected at the 5% level and the model is a poor fit. The full results including coefficients, standard errors, z-score, and confidence interval, of the SEM model can be seen in Table E2 in Appendix E.

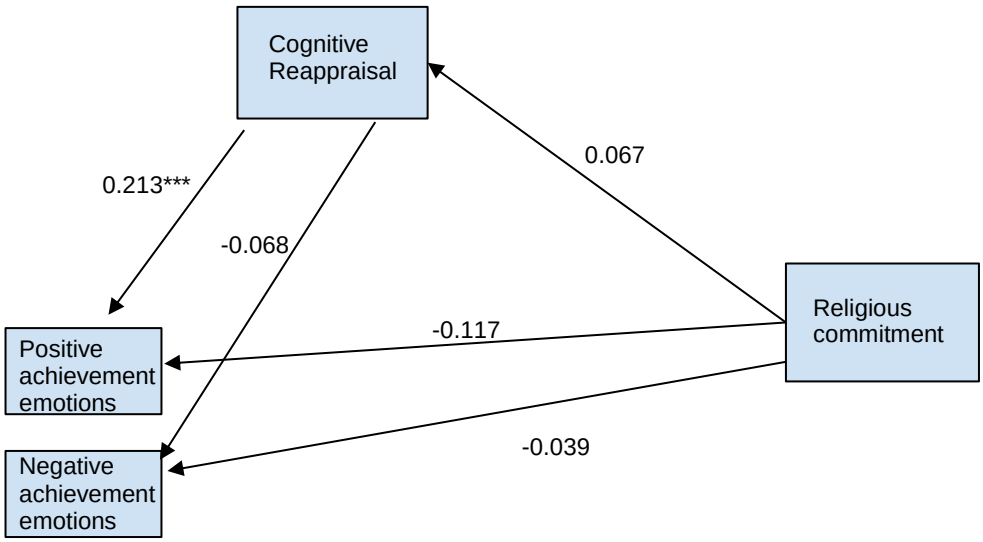

Figure 6. *SEM analysis H5c, * = pvalue<0.1, ** = pvalue<0.05, *** = pvalue <0.01*

This last hypothesis, 5c, states that religious commitment is a predictor of achievement emotions through cognitive reappraisal. The hypothesis cannot be accepted as there are no statistical significant results found that support it.

Discussion

This paper tested the relationship between religious commitment, the incremental theory of intelligence, achievement emotions, and academic performance in the Netherlands. Even though the hypotheses formulations in this research are based on causality, given the methodology the research cannot draw causal conclusions. Therefore, interpretation of the results will be done using correlational links.

Academic performance

No relationship between religious commitment and the incremental theory of intelligence is found. Religious commitment is related to the final grade of high school, and the incremental theory of intelligence is related to taking a re-sit in high school. However, no evidence is provided for the relationship of religious commitment and academic achievement through the incremental theory of intelligence. Attending a religious school is associated positively with religious commitment.

The missing link between the incremental theory of intelligence and religious commitment confirms the previous findings of Dweck et al. (1995). The more reliable measure for religious commitment used in this paper thus did not provide evidence for the proposed link. The link between religious commitment and academic performance that was found previously by Jeynes (2002, 2002a, 2002b, 2012) and Regnerus (2000) is confirmed by this research as the final grade of high school and academic performance showed to be related. Also, the link between the incremental theory of intelligence and academic performance, previously found by Claro et al. (2016) and Sisk et al. (2018), is confirmed with this research showing a relationship between taking a re-sit in high school and academic performance. However, important to realise is that this research showed a negative link while previous research showed positive results. So even though the link is confirmed, the results actually predict the opposite. The proposed mediator effect of the incremental theory on the relationship between religious commitment and academic performance tried to add some new knowledge to this mentioned literatures but as showed before no effects are found. And even though attending a religious school is associated with religious commitment, this does not provide any evidence for the effect of the incremental theory

of intelligence on the academic performance of private schools in the Netherlands. The positive relationship between attending a religious school and religious commitment does show evidence for the reasoning that the proclaiming of religion in religious school may lead to students being more religious committed. Also, it may be the case that students that are religious committed (or whose parents are) choose a school that is in accordance with their beliefs.

Achievement emotions

The incremental theory of intelligence is associated positively with experiencing positive achievement emotions and negatively with the experiencing of negative achievement emotions. But even though cognitive reappraisal is associated with positive achievement emotions, there is no relationship between religious commitment and achievement emotions through cognitive reappraisal found.

The previous findings of Kin, McInerney & Watkins (2012) regarding the positive relationship between positive achievement emotions and the incremental theory of intelligence and the negative relationship between negative achievement emotions and the incremental theory is confirmed in the current paper. In line with previous findings of Pekrun (2006) and Sorić et al. (2013) a relationship is found between cognitive reappraisal and positive achievement emotions. For negative achievement emotions this relationship is not confirmed with the current research. What is not confirmed too is the relationship between religious commitment and cognitive reappraisal that is found before by Vishkin et al. (2016). These missing effects may be reasons of why the proposed novel mediator effect of cognitive reappraisal on the relationship between religious commitment and achievement emotions is not found.

Limitations and Recommendations

In this research, a questionnaire was constructed and spread to get information about the relationship between religious commitment, the incremental theory of intelligence, achievement emotions, and academic performance in the Netherlands. Even though the research is performed with highest effort and caution, there are still a number of limitations.

First, the Dweck's Mindset Instrument, that participants had to complete, asked statements about intelligence and its malleability. However, this questionnaire did not provide participants with a basic definition of intelligence which might have caused some confusion among different participants. In particular, intelligence could be interpreted differently in terms of for example 'book smart' when someone's IQ might be high, or 'life smart' when someone might tackle life issues really well.

The second limitation is regarding the environment in which participants completed the questionnaire. As the questionnaire is spread online there is no control on environmental factors. For example, participants might have gotten distracted while filling in the questionnaire leading to lesser concentration and by that maybe be less careful while reading the questions or less thoughtful while answering. It might have been better to ask subjects to come to a lab where conditions could be held constant to avoid external factors influencing the answering of the questionnaire. However, due to monetary and institutional reasons this was not possible for this research.

The third limitation is the length of the total questionnaire. Due to the high number of different questionnaires put together combined with the demographic, school performance, and religion questions, it took about 10 minutes to complete the survey. Even though gift cards were used to motivate subjects to complete the survey, this still could be quite a long time for participants to keep their motivation Especially as not everyone is used to filling in surveys and answering the kind of statements

that were included. Getting less motivation along the way might lead to less thoughtful answering in the latter part of the survey and this might have influenced the relationships between variables.

The fourth and last limitation is the sample. Even though the research tried to get a representative sample of participants, it is possible that because of the spreading of the survey by myself to people in my social network the sample is not representative of the whole Dutch nation. For example, relatively more university educated people might be represented in the survey and this might give biased results.

Finally, in further research it may be interesting to not only include the Christian or Catholic schools, but all sort of private schools in the Netherlands. Second, it might be interesting to look at the causality of the relationship between attending a private school and religious commitment. Also, maybe a shorter and therefore easier questionnaire can be constructed with lesser statements that is performed in a lab to avoid motivational problems and distraction. If a significant relationship then is found between attending a private school and the incremental theory of intelligence, it may be interesting to look for causal relationships to see which direction this relationship has and if implicit theories of intelligence might be an explanation for the academic performance in private schools.

Conclusion

In this paper a questionnaire is conducted which contained the Learning-related part of the Achievement Emotions Questionnaire, Dweck's Mindset Instrument, the Religious Commitment Inventory-10 and the cognitive reappraisal part of the Emotion Regulation Questionnaire. Also, through the survey information was gathered regarding one's academic performance, religious school attendance, socio-economic status, gender, and age. With the data obtained for this questionnaire the following research question can be answered: "To what extent are religious commitment, the incremental theory of intelligence, achievement emotions, and academic performance in the Netherlands related to each other?". Literature and reasoning predicted that the incremental theory of intelligence might explain the better performance of religious schools in the Netherlands by use of relationships with religious commitment. Also, the incremental theory might be related to achievement emotions. Lastly, religious commitment might be associated with achievement emotions through cognitive reappraisal.

A relationship between religious commitment and academic performance through the incremental theory of intelligence is not found. Also, no evidence is found for the mediator effect of cognitive reappraisal on the relation between religious commitment and achievement emotions. The research did find a weak but existent relationship between academic performance and both religious commitment and the incremental theory of intelligence. The paper also found proof for the association between attending a religious school and religious commitment. Next, the incremental theory is found to be associated with both positive and negative achievement emotions. Lastly, the paper shows that cognitive reappraisal is related to positive achievement emotions.

Concluding, even though some significant results are gathered, the current paper (i) cannot explain the better academic performance in religious schools in the Netherlands and (ii) does not add new knowledge to the already existing literature regarding the determinants of achievement emotions.

References

Akkermans, P. W. C. (1997). De juridische vormgeving van de onderwijsverzuiling. *Verzuiling in het Onderwijs: Actuele Verklaringen en Analyse, Groningen*, 57-83.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78*(1), 246-263. doi:10.1111/j.1467-8624.2007.00995.x

Bråten, I., & Strømsø, H. I. (2004). Epistemological beliefs and implicit theories of intelligence as predictors of achievement goals. *Contemporary Educational Psychology, 29*(4), 371-388. doi:10.1016/j.cedpsych.2003.10.001

Claro, S., Paunesku, D., & Dweck, C. S. (2016). Growth mindset tempers the effects of poverty on academic achievement. *Proceedings of the National Academy of Sciences*, *113*(31), 8664-8668.

Dweck, C.S. (2006). Mindset: The new psychology of success. New York, NY: Random House Publishing Group.

Dweck, C. S., Chiu, C. Y., & Hong, Y. Y. (1995). Implicit theories and their role in judgments and reactions: A word from two perspectives. *Psychological inquiry*, *6*(4), 267-285.

Dijkstra, A., & Peschar, J. L. (1996). Religious determinants of academic attainment in the netherlands. *Comparative Education Review, 40*(1), 47-65. doi:10.1086/447355

Franken, L., & Vermeer, P. (2019). Deconfessionalising RE in pillarised education systems: A case study of belgium and the netherlands. *British Journal of Religious Education, 41*(3), 272-285. doi:10.1080/01416200.2017.1405792

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes. *Journal of Personality and Social Psychology, 85*(2), 348-362. doi:10.1037/0022-3514.85.2.348

Het Parool (2017, september 2). ‘’Religieus onderwijs staat haaks op diversiteit’’ Retrieved from https://www.parool.nl/columns-opinie/religieus-onderwijs-staat-haaks-op-diversiteit~bacc7243/?referer=https%3A%2F%2Fwww.google.com%2F

Hill, T. D., Burdette, A. M., Ellison, C. G., & Musick, M. A. (2006). Religious attendance and the health behaviors of texas adults. *Preventive Medicine, 42*(4), 309-312. doi:10.1016/j.ypmed.2005.12.005

Jeynes, W. (2002). Why religious schools positively impact the academic achievement of children. *International Journal of Education and Religion, 3*(1), 16-32. doi:10.1163/157006202760182418

Jeynes, W. H. (2002a). Educational policy and the effects of attending a religious school on the academic achievement of children. *Educational Policy, 16*(3), 406-424. doi:10.1177/08904802016003003

Jeynes, W. H. (2002b). A meta-analysis of the effects of attending religious schools and religiosity on black and hispanic academic achievement. *Education and Urban Society, 35*(1), 27-49. doi:10.1177/001312402237213

Jeynes, W. H. (2012). A meta-analysis on the effects and contributions of public, public charter, and religious schools on student outcomes. *Peabody Journal of Education, 87*(3), 305-335. doi:10.1080/0161956X.2012.679542

King, R. B., McInerney, D. M., & Watkins, D. A. (2012). How you think about your intelligence determines how you feel in school: The role of theories of intelligence on academic emotions. *Learning and Individual Differences, 22*(6), 814-819. doi:10.1016/j.lindif.2012.04.005

Lin, N., Ensel, W. M., & Vaughn, J. C. (1981). Social resources and strength of ties: Structural factors in occupational status attainment. *American sociological review*, 393-405.

Regnerus, M. D. (2000). Shaping schooling success: Religious socialization and educational outcomes in metropolitan public schools. *Journal for the scientific study of religion*, *39*(3), 363-370.

McCullough, M. E., & Worthington Jr, E. L. (1995). College students' perceptions of a psychotherapist's treatment of a religious issue: Partial replication and extension. *Journal of Counseling & Development*, *73*(6), 626-634.

McCullough, M. E., Worthington, E. L., Maxey, J., & Rachal, K. C. (1997). Gender in the context of supportive and challenging religious counseling interventions. *Journal of Counseling Psychology, 44*(1), 80-88. doi:10.1037//0022-0167.44.1.80

Morrow, D., Worthington Jr, E. L., & McCullough, M. E. (1993). Observers' perceptions of a counselor's treatment of a religious issue. *Journal of Counseling & Development, 71*(4), 452-456.

Pekrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions. *Journal of Educational Psychology, 101*(1), 115-135. doi:10.1037/a0013383

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The achievement emotions questionnaire (AEQ). *Contemporary Educational Psychology, 36*(1), 36-48. doi:10.1016/j.cedpsych.2010.10.002

Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational psychology review, 18*(4), 315-341.

Rijksoverheid, 2020. Openbaar en bijzonder onderwijs. Retrieved from https://www.rijksoverheid.nl/onderwerpen/vrijheid-van-onderwijs/openbaar-en-bijzonder-onderwijs

Rissanen, I., Kuusisto, E., Hanhimäki, E., & Tirri, K. (2018). The implications of teachers' implicit theories for moral education: A case study from finland. *Journal of Moral Education, 47*(1), 63-77. doi:10.1080/03057240.2017.1374244

RTL Nieuws (2018, february 21) ‘’Minder zittenblijvers en hogere cijfers op protestantse middelbare scholen.’’ Retrieved from https://www.rtlnieuws.nl/facts/onderwijs/artikel/3863676/minder-zittenblijvers-hogere-cijfers-op-protestantse-middelbare

Romero, C., Master, A., Paunesku, D., Dweck, C. S., & Gross, J. J. (2014). Academic and emotional functioning in middle school: The role of implicit theories. *Emotion, 14*(2), 227.

Singla, 2018. An introductory Guide to Maximum Likelihood Estimation. Retrieved from https://www.analyticsvidhya.com/blog/2018/07/introductory-guide-maximum-likelihood-estimation-case-study-r/

Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? two meta-analyses. *Psychological Science, 29*(4), 549-571. doi:10.1177/0956797617739704

Sorić, I., Penezić, Z., & Burić, I. (2013). *Big five personality traits, cognitive appraisals and emotion regulation strategies as predictors of achievement emotions.* (No. 22).Filozofski fakultet u Rijeci.

Retrieved from https://hrcak.srce.hr/108516

Turner, J. E., & Schallert, D. L. (2001). Expectancy-value relationships of shame reactions and shame resiliency. *Journal of Educational Psychology, 93*(2), 320-329. doi:10.1037/0022-0663.93.2.320

Van Dijk-Groeneboer, M., De Koning, M., Kregting, J., & Roeland, J. H. (2010). Ze geloven het wel. *Handboek jongeren en religie* (pp. 25-87) Parthenon. Retrieved from https://www.narcis.nl/publication/RecordID/oai:research.vu.nl:publications%2F8c8db3ca-ad86-4766-81d5-a72e5a8cb749

Vermeer, P. A. D. M. (2013). Religious indifference and religious education in the netherlands: A tension unfolds. *Theo-Web : Zeitschrift Für Religionspädagogik, 12*, 79-94. Retrieved from https://www.narcis.nl/publication/RecordID/oai:repository.ubn.ru.nl:2066%2F119957

Vishkin, A., Bigman, Y. E., Porat, R., Solak, N., Halperin, E., & Tamir, M. (2016). God rest our hearts: Religiosity and cognitive reappraisal. *Emotion (Washington, D.C.), 16*(2), 252-262. doi:10.1037/emo0000108

Westerman, W. E. (2001). Ongewenste objectiviteit. Onderwijs in geestelijke stromingen in historisch en vergelijkend perspectief.

Worthington, E. L., Wade, N. G., Hight, T. L., Ripley, J. S., McCullough, M. E., Berry, J. W., . . . O'Connor, L. (2003). The religious commitment inventory-10. *Journal of Counseling Psychology, 50*(1), 84-96. doi:10.1037/0022-0167.50.1.84

Appendix A – Survey content

Q1 Both my elementary and high school were Dutch

- Yes (1)
- No (2)

Page Break

Q2 Gender

- Male (1)
- Female (2)

Q3 Age

- 15 and younger (1)
- 16-19 years (2)
- 20-25 years (3)
- 26-35 years (4)
- 36-45 years (5)
- 46-55 years (6)
- 56 and older (7)

Page Break

Q4 Imagine you are part of a study program, to what extent do you agree with the following statements?

1 = Totally disagree
2 = Disagree
3 = Slightly disagree
4 = Slightly agree
5 = Agree
6 = Totally Agree

	1 2 3 4 5 6
I enjoy acquiring new knowledge ()	
I have an optimistic view toward studying ()	
I'm proud of my capacity ()	
Studying makes me irritated ()	
I get tense and nervous while studying ()	
I feel ashamed that I can't absorb the simplest of details ()	
I feel hopeless when I think about studying ()	
The material bores me to death ()	

Page Break

Q5

Read the statements below and state to what extent you agree with them. There are no right or wrong answers.

1 = Totally disagree
2 = Disagree
3 = Slightly disagree
4 = Slightly agree
5 = Agree
6 = Totally Agree

	1 2 3 4 5 6
You have a certain amount of intelligence, and you really can't do much to change it. ()	
Your intelligence is something about you that you can't change very much. ()	
No matter who you are, you can significantly change your intelligence level. ()	
To be honest, you can't really change how intelligent you are. ()	
You can always substantially change how intelligent you are. ()	
You can learn new things, but you can't really change your basic intelligence. ()	
No matter how much intelligence you have, you can always change it quite a bit. ()	
You can change even your basic intelligence level considerably. ()	

Page Break

Q6 Which faith do you adhere?

- ○ Christian (1)
- ○ Catholic (2)
- ○ Islam (3)
- ○ Other (4)
- ○ Non (5)

Page Break

Q7
To what extent do you agree with the statements below?

1 = Totally disagree
2 = Disagree
3 = Slightly disagree
4 = Slightly agree
5 = Agree
6 = Totally Agree

	1 2 3 3 4 5
I often read books and magazines about my faith. ()	
I make financial contributions to my religious organization. ()	
I spend time trying to grow in understanding of my faith. ()	
Religion is especially important to me because it answers many questions about the meaning of life. ()	
My religious beliefs lie behind my whole approach to life. ()	
I enjoy spending time with others of my religious affiliation. ()	
Religious beliefs influence all my dealings in life. ()	
It is important to me to spend periods of time in private religious thought and reflection. ()	
I enjoy working in the activities of my religious organization. ()	
I keep well informed about my local religious group and have some influence in its decisions. ()	

Page Break

Q8
To what extent do you agree with the statements below?

1 = Totally disagree
2 = Disagree
3 = Slightly disagree
4 = Slightly agree
5 = Agree
6 = Totally Agree

	1 2 3 4 5 6
I control my emotions by changing the way I think about the situation I'm in. ()	
When I want to feel less negative emotion, I change the way I'm thinking about the situation ()	
When I want to feel more positive emotion, I change the way I'm thinking about the situation. ()	
When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about. ()	
When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about. ()	
When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm. ()	

Page Break

Q9 My elementary school was

- ○ Christian (1)
- ○ Catholic (2)
- ○ Islam (3)
- ○ Public (4)

Q10
This question is about your time in elementary school from grade 3 and higher.

What is true for you?

- ○ I had no problems with going to the next group (1)
- ○ I had a little problems with going to the next group (2)
- ○ It was difficult for me to go to the next group each year (3)
- ○ I had to redo a schoolyear once (4)
- ○ I had to redo a schoolyear more than once (5)

Page Break

Q11 My high school was/is

- Christian (1)
- Catholic (2)
- Islam (3)
- Public (4)

Q12 My level in high school was/is

- Practical education (1)
- VMBO/MULO (2)
- HAVO/MMS (3)
- VWO/HBS (4)

Q13 I graduated high school with a final grade of

- 5,5 - 6 (1)
- 6,1 - 7 (2)
- 7,1-8 (3)
- 8,1 - 10 (4)
- I am not graduated (yet) (5)

Q14 I had to take a resit for my final exams in high school

- ○ Yes (1)
- ○ No (2)

Page Break

Q15 What was the job of your father during your youth?

_____

Q16 What was the job of your mother during your youth?

_____

Page Break

Q17 If you want to take part in the lottery with gift cards leave your mail below. It will only be used for the lottery.

_____

Appendix B – Correlations

Table 3. *Correlation coefficients*

	Gender	Age	PAE	NAE	ITI	Faith	CR	ES_f	ES_p	HS_f	HS_l	HS_g	HS_r	SES	RC
Gender	1.000														
Age	-0.172**	1.000													
PAE	0.061	0.137	1.000												
NAE	-0.144*	-0.137	-0.247***	1.000											
ITI	0.074	0.027	0.202**	-0.234***	1.000										
Faith	0.168*	-0.257***	-0.114	-0.020	0.066	1.000									
CR	0.130	0.079	0.206**	-0.071	0.150*	-0.040	1.000								
ES_f	0.062	-0.196**	-0.103	0.038	0.093	0.414***	-0.084	1.000							
ES_p	0.017	0.030	0.120	0.169**	0.052	-0.010	-0.081	0.058	1.000						
HS_f	0.171**	-0.128	-0.179**	0.069	0.075	0.526***	-0.003	0.460***	0.077	1.000					
HS_l	-0.100	-0.217**	-0.101	-0.090	-0.097	0.014	-0.081	0.093	-0.394***	-0.043	1.000				
HS_g	0.068	-0.054	0.128	-0.157*	-0.033	0.140	0.041	0.031	-0.062	0.015	-0.009	1.000			
HS_r	-0.061	-0.129	-0.025	0.33	-0.237	-0.018	-0.017	0.060	-0.083	0.037	0.127	0.057	1.000		
SES	0.051	-0.295***	0.119	-0.049	0.028	0.109	-0.041	0.046	-0.050	-0.014	0.366***	-0.015	0.164*	1.000	
RC	0.124	-0.282***	-0.103	-0.044	0.073	0.802***	0.067	0.370***	-0.114	0.465***	0.103	0.217**	0.028	0.080	1.000

*Notes: *pvalue<0.1; **pvalue<0.05; *** pvalue <0.01. PAE=Positive achievement emotions, NAE=Negative achievement emotions, ITI-Incremental theory of intelligence, CR=Cognitive reappraisal, ES_f=elementary school faith, ES_p=Elementary school performance, HS_f=High school faith, HS_l=High school level, HS_g=High school grade, HS_r=High school re-do, SES-Socioeconomic status, and RC=Religious commitment*

Appendix C – Normality test

Table C1. *Skewness/Kurtosis test for Normality*

	Joint				
	Obs.	**Pr(Skweness)**	**Pr(Kurtosis)**	**Adj chi2(2)**	**Prob>chi2**
PAE	135	0.002	0.066	11.11	0.004
NAE	135	0.001	0.537	10.55	0.005
RC	135	0.307	0.000	.	.
Gender	135	0.125	.	.	.
Age	135	0.000	0.006	27.11	0.000
Incremental	135	0.274	0.226	2.71	0.257
Faith	135	0.000	0.000	50.10	0.000
CR	135	0.599	0.348	1.18	0.556
ES_f	135	0.000	0.000	46.93	0.000
ES_p	135	0.000	0.000	.	0.000
HS_f	135	0.000	0.030	33.55	0.000
HS_l	135	0.000	0.359	18.28	0.000
HS_g	135	0.258	0.285	2.47	0.291
HS_r	135	0.000	0.000	.	0.000
SES	135	0.773	0.000	21.91	0.000

Note: PAE=Positive achievement emotions, NAE=Negative achievement emotions, ITI-Incremental theory of intelligence, CR=Cognitive reappraisal, ES_f=elementary school faith, ES_p=Elementary school performance, HS_f=High school faith, HS_l=High school level, HS_g=High school grade, HS_r=High school re-do, SES-Socioeconomic status, and RC=Religious commitment

Appendix D - Regressions

Table D1. *Full results regression H1*

	Incremental					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
RC	0.020	0.044	0.46	0.643	-0.066	0.106
Age	-0.081	0.801	-0.10	0.920	-0.665	1.504
Gender	0.916	1.509	0.61	0.545	-2.069	3.902
SES	-0.012	0.234	-0.05	0.960	-0.475	0.451
Constant	28.43	3.134	9.07	0.000	22.233	34.632

*Note: *p<0.05, **p<0.01, ***p<0.001. RC = religious commitment, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D2. *Full results regression H2a – ES_p*

	ES_p					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
RC	-0.004	0.003	-1.09	0.277	-0.010	0.003
Age	-0.039	0.043	-0.9	0.372	-0.124	0.046
Gender	-0.046	0.114	-0.41	0.686	-0.271	0.179
SES	-0.017	0.019	-0.9	0.370	-0.053	0.020
Constant	1.512	0.310	4.87	0.000	0.894	2.126

*Note: *p<0.05, **p<0.01, ***p<0.001. ES_p = elementary school performance, RC = religious commitment, SES = socio-economic status*

	HS_l					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
RC	0.002	0.003	0.47	0.639	-0.005	0.008
Age	-0.130	0.058	-2.23	0.027	-0.244	-0.147
Gender	-0.211	0.120	-1.75	0.082	-0.449	0.027
SES	0.075	0.019	4.04	0.000	0.038	0.112
Constant	3.330	0.267	12.45	0.000	2.800	3.859

*Note: *p<0.05, **p<0.01, ***p<0.001. H_l = high school level, RC = religious commitment, SES = socio-economic status*

Table D4. *Full results regression H2a – HS_g*

	HS_g					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf.**	**Interval]**
RC	0.007	0.004	2.09	0.038	0.0004	0.014
Age	-0.012	0.063	-0.20	0.845	-0.137	0.112
Gender	0.074	0.139	0.54	0.593	-0.200	0.349
SES	-0.022	0.025	-0.88	0.379	-0.070	0.027
Constant	2.625	0.308	8.53	0.000	2.016	3.234

*Note: *p<0.05, **p<0.01, ***p<0.001. H_g = high school grade, RC = religious commitment, SES = socio-economic status*

Table D5. *Full results regression H2a – HS_r*

	HS_r					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
RC	-0.0001	0.001	-0.10	0.918	-0.002	0.001
Age	-0.013	0.017	-0.78	0.434	-0.046	0.020
Gender	-0.027	0.027	-1.02	0.311	-0.081	0.026
SES	0.009	0.006	1.47	0.145	-0.003	0.022
Constant	0.951	0.074	12.88	0.000	0.805	1.097

*Note: *p<0.05, **p<0.01, ***p<0.001. H_r = high school re-do, RC = religious commitment, SES = socio-economic status*

Table D6. *Full results regression H2b – ES_p*

	ES_p					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	0.005	0.007	0.70	0.488	-0.009	0.018
Age	-0.022	0.034	-0.64	0.521	-0.090	0.046
Gender	-0.065	0.117	-0.55	0.580	-0.296	0.166
SES	-0.017	0.019	-0.91	0.364	-0.054	0.020
Constant	1.264***	0.300	4.22	0.000	0.671	1.857

*Note: *p<0.05, **p<0.01, ***p<0.001. ES_p = elementary school performance, SES = socio-economic status*

Table D7. *Full results regression H2b– HS_l*

	HS_l					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	-0.012	0.007	-1.66	0.100	-0.026	0.002
Age	-0.138	0.057	-2.41	0.017	-0.252	-0.025
Gender	-0.193	0.117	-1.65	0.102	-0.425	0.039
SES	0.075	0.018	4.10	0.000	0.039	0.111
Constant	3.719	0.293	12.69	0.000	3.140	4.300

*Note: *p<0.05, **p<0.01, ***p<0.001. H_l = high school level, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D8. *Full results regression H2b – HS_g*

	HS_g					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	-0.004	0.008	-0.51	0.613	-0.021	0.012
Age	-0.045	0.093	-0.72	0.476	-0.171	0.080
Gender	0.108	0.139	0.77	0.441	-0.168	0.383
SES	-0.021	0.025	-0.83	0.406	-0.071	0.029
Constant	2.981	0.391	7.62	0.000	2.207	3.755

*Note: *p<0.05, **p<0.01, ***p<0.001. H_g = high school grade, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D9. *Full results regression H2b – HS_r*

	HS_r					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	-0.005	0.003	-2.00	0.048	-0.010	-0.000
Age	-0.014	0.015	-0.91	0.367	-0.044	0.016
Gender	-0.023	0.025	-0.89	0.377	-0.073	0.028
SES	0.010	0.006	1.54	0.125	-0.003	0.021
Constant	1.098	0.080	13.70	0.000	0.940	1.257

*Note: *p<0.05, **p<0.01, ***p<0.001. H_r = high school re-do, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D10. *Full results regression H4 – PAE*

	PAE					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	0.069	0.022	3.16	0.002	0.026	0.113
Age	0.0133	0.162	0.82	0.413	-0.187	0.453
Gender	0.207	0.348	0.60	0.553	-0.482	0.897
SES	0.081	0.050	1.64	0.104	-0.017	0.180
Constant	11.575	0.871	13.29	0.000	9.852	13.297

*Note: *p<0.05, **p<0.01, ***p<0.001. PAE = positive achievement emotions, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D11. *Full results regression H4 – NAE*

	NAE					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Incremental	-0.173	0.055	-3.11	0.002	-0.282	-0.063
Age	0.022	0.419	0.05	0.959	-0.807	0.851
Gender	-0.667	0.804	-0.83	0.409	-2.257	0.924
SES	-0.098	0.146	-0.67	0.502	-0.387	0.190
Constant	17.769	2.201	8.07	0.000	13.415	22.123

*Note: *p<0.05, **p<0.01, ***p<0.001. NAE = positive achievement emotions, SES = socio-economic status, Incremental = incremental theory of intelligence*

Table D12. *Full results regression H5a – CR*

	CR					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
RC	0.004	0.022	0.20	0.845	-0.040	0.048
Age	0.109	0.271	0.40	0.689	-0.427	0.644
Gender	1.037	0.767	1.35	0.179	-0.480	2.555
SES	-0.058	0.130	-0.45	0.654	-0.315	0.199
Constant	24.066	1.571	15.32	0.000	20.959	27.174

*Note: *p<0.05, **p<0.01, ***p<0.001. CR = cognitive reappraisal, RC = religious commitment, SES = socio-economic status*

Table D13. *Full results regression H5b – PAE*

	PAE					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
CR	0.104	0.386	2.69	0.008	0.027	0.180
Age	0.112	0.180	0.62	0.536	-0.245	0.468
Gender	0.167	0.359	0.47	0.642	-0.512	0.877
SES	0.087	0.051	1.70	0.091	-0.014	0.187
Constant	11.083	1.099	10.08	0.000	8.908	13.258

*Note: *p<0.05, **p<0.01, ***p<0.001. PAE = positive achievement emotions, CR = cognitive reappraisal, SES = socio-economic status*

Table D14. *Full results regression H5b – NAE*

	NAE					
	Coef.	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
CR	-0.099	0.083	-1.19	0.237	-0.263	0.066
Age	0.060	0.455	0.13	0.896	-0.841	0.961
Gender	-0.734	0.857	-0.86	0.393	-2.430	0.962
SES	-0.102	0.150	-0.68	0.496	-0.398	0.194
Constant	15.140	2.595	5.83	0.000	10.006	20.273

*Note: *p<0.05, **p<0.01, ***p<0.001. NAE = negative achievement emotions, CR = cognitive reappraisal, SES = socio-economic status*

Appendix E – Structural Equation Modelling

Tabel E1. Results *SEM H5c*

	Coef.	Std. Err.	z	P>z	**[95% Conf. Interval]**	
Structural						
Incremental						
RC	0.074	0.087	0.85	0.394	-0.096	0.244
Constant	62.964	6.790	9.27	0.000	49.655	76.273
Ac.Perf.						
Incremental	0.053	0.360	1.46	0.144	-0.018	0.123
RC	-0.060	0.040	-1.53	0.127	-0.138	0.017
Measurement						
ES_p						
Ac.Perf.	1 (constrained)					
Constant	68.533	3.673	18.66	0.000	61.334	75.732
HS_l						
Ac.Perf.	-1.869	0.803	-2.33	0.020	-3.444	-0.294
Constant	67.004	6.677	10.03	0.000	53.917	80.091
HS_g						
Ac.Perf.	-0.246	0.362	-0.68	0.497	-0.954	0.463
Constant	67.869	3.190	21.27	0.000	31.617	74.122
HS_r						
Ac.Perf.	-0.199	0.126	-1.58	0.114	-0.446	0.048
Constant	67.894	1.173	57.85	0.000	65.594	70.194
Variances						
Var(ES_p)	259.733	66.195			157.613	428.019
Var(HS_l)	663.153	224.534			341.515	1287.71
Var(HS_g)	1270.169	155.598			999.051	1614.862
Var(HS_r)	125.536	15.850			98.016	160.783
Var(Incremental)	1507.888	183.534			1187.857	1914.142
Var(Ac.Perf.)	129.039	64.501			48.447	343.715
Observations						135
Prob>chi2						0.081

*Note: *p<0.05, **p<0.01, ***p<0.001. Incremental = incremental theory of intelligence, RC = religious commitment, ES_p = elementary school performance, HS_f=High school faith, HS_l=High school level, HS_g=High school grade, HS_r=High school re-do, Ac.Perf. = academic performance*

Tabel E2. Results *SEM H5c*

	Coef.	Std. Err.	z	P>z	**[95% Conf. Interval]**	
CR						
RC	0.067	0.087	0.78	0.437	-0.103	0.237
Constant	63.426	6.778	9.36	0.000	50.131	76.701
PAE						
CR	0.211	0.830	2.54	0.011	0.048	0.374
RC	-0.117	0.084	-1.39	0.194	-0.281	0.048
Constant	61.590	8.385	7.35	0.000	45.155	78.025
NAE						
CR	-0.068	0.086	-0.79	0.429	-0.236	0.100
RC	-0.040	0.087	-0.46	0.648	-0.210	0.131
Constant	75.318	8.690	8.67	0.000	58.285	92.351
Variances						
Var(CR)	1502.426	182.869			1183.552	1907.204
Var(PAE)	1394.895	169.781			1098.845	1770.706
Var(NAE)	1498.291	182.366			1180.297	1901.959
Observations						135
Prob>chi2						0.004

*Note: *p<0.05, **p<0.01, ***p<0.001. PAE = positive achievement emotions, NAE = negative achievement emotions, CR = cognitive reappraisal, RC = religious commitment*