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# **Social Withdrawal and Academic Achievements: Longitudinal Relations Through Ages 6, 8, and 10.**

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# SOCIAL WITHDRAWAL AND ACADEMIC ACHIEVEMENTS IN CHILDREN

## **Preface**

The attached article is written as a scientific article with aims of being submitted to an international peer-reviewed journal. As such, this article is written in accordance with the manuscript requirements presented in the APA-publishers manual and follows the technical and basic content requirements of the Journal of Educational Psychology. In addition to the scientific article, I have included a more extensive review of theory and literature regarding social withdrawal, applied methods and a brief summary of the main findings of the study. These additions are presented first, and the scientific article itself is presented second. The work presented here was carried out as a study assignment at the Special Education master's programme at the Department of Education and Lifelong Learning, Faculty of Social and Educational Sciences, NTNU Trondheim, under the supervision of Professor Frode Stenseng.

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Eivind Burheim Tingstad, Trondheim, May 2019

**Table of Contents**

<b>Social Withdrawal – Theoretical- and Historical Perspectives</b>	<b>1</b>
<b>Hypotheses</b>	<b>4</b>
<b>Method and Scientific Theory</b>	<b>6</b>
<i>Longitudinal studies</i>	6
<i>Structural Equation Modeling and Cross-Lagged Panel Analyses</i>	6
<i>Reliability and validity</i>	8
<b>Main findings</b>	<b>10</b>
<i>Implications</i>	11
<i>Implications for the field of Special Education</i>	11
<b>References</b>	<b>13</b>
<b>Abstract</b>	<b>19</b>
<b>Introduction</b>	<b>21</b>
<i>Social Interaction and Knowledge Acquisition</i>	21
<i>The Need to Belong, Social Competence and Self-esteem</i>	22
<i>Social Prerequisites for Academic Achievement</i>	24
<i>Social Withdrawal and Academic Achievement – Underlying mechanisms</i>	25
<i>The Present Study</i>	27
<b>Method</b>	<b>27</b>
<i>Participants and Procedure</i>	27
<i>Measures</i>	29
Social Withdrawal	29
Academic Achievement	29
<b>Results</b>	<b>30</b>
<i>Descriptive statistics</i>	30
<i>Structural Equation Modeling</i>	30
<b>Discussion</b>	<b>33</b>
<i>Gender differences</i>	36
<i>Limitations and Future Research</i>	37
<i>Implications and Conclusions</i>	38
<b>References</b>	<b>41</b>
<b>Tables</b>	<b>46</b>
<b>Figures</b>	<b>47</b>

### **Social Withdrawal – Theoretical- and Historical Perspectives**

Children interact with their peers in many ways, shapes and forms. The peer interaction of children has been valued as a field of study since the early 1900s. This early research, such as that of Piaget and Mead – pioneers in pedagogical theory – suggested that peer interaction is an essential part of the socialization of children and the child's ability to learn about itself in relation to others (Rubin & Coplan, 2010). Peer interaction was established as an important part of the development of social cognition and social behaviours, but this notion also prompted the question: what about the children that avoid peer interaction? During free play in school, some children can be found interacting with a small group of peers, such as playing rule-based games or taking part in socio-dramatic play. Other children spend their time next to their peers, such as while drawing or building with blocks – only occasionally observing what their peers do. Other children, still, prefer to play alone, in quiet, and observe other children's play – without attempting to join in on the play. The behaviour of this third group of children is commonly labelled as social withdrawal, but labels such as “inhibition” “isolation” and “shyness” have also been used in recent literature regarding child psychology (Rubin & Asendorpf, 1993). Social withdrawal, inhibition and shyness are theoretical constructs that overlap and are deeply connected with one another, but in the core of this triangle is the behavioural pattern of solitude. Additional constructs are also vaguely attached to this trinity, such as social exclusion, neglect, rejection and social reticence – all of which suggest the child is somehow on the outside of something. One central question in defining social withdrawal is why the child is withdrawn, and if the child itself has withdrawn from its peers or if the child has been excluded; is the child isolated *from* the peer group, or *by* the peer group?

Social Withdrawal (SW) is the behavioural pattern of children that prefer solitude, playing alone, and children that tend to avoid interaction with other children, and in the recent years the construct of social withdrawal has arisen as the most commonly used label of all of the underlying behaviours (Rubin & Asendorpf, 1993; Rubin, Burgess, Kennedy & Stewart, 2003; Rubin & Coplan, 2010) Coplan, Prakash, O'Neil & Armer (2004) recently designed the Child Social Preference Scale (CSPS) to distinguish between two internal dimensions of social withdrawal: Conflicted shyness and social disinterest. Conflicted shyness is used to describe children that are too anxious or fearful to initiate social interactions with their peers. social disinterest describes children that lack interest and strong motivation to engage in social interaction. Active isolation is also suggested as a behaviour within the construct of social withdrawal, but differentiates itself from conflicted shyness and social disinterest, as active isolation is attributed to external factors, and describes children that are being actively isolated and avoided by children in their surrounding social milieu (Coplan et al., 2004). Approach and avoidance motivations are used to describe the differences between these two dimensions of internally attributed social withdrawal. Children who are assessed as socially disinterested are characterized by both low approach-motivation and low avoidance-motivation. These children are content in playing alone, and spending time in solitude (Coplan et al., 2004). On the other hand, children who are assessed as part of the conflicted shyness-dimension of social withdrawal experience a conflict between high approach-motivation and high avoidance-motivation. They want to interact with other children, but they are inhibited by anxiety and social fear.

Why do some children develop shyness in childhood, while others do not?

Researchers have suggested many aspects of the child's life as reasons for their social withdrawal, one of which is parenting styles. Authoritarian parenting styles (harsh, punitive, strict) have been shown to relate with social isolation and -withdrawal in childhood.



Overprotective and over-solicitous parenting styles that help manage situations for the child and reduce the child's independence are also at risk of preventing shy children from developing the necessary strategies for being social with their peers (Coplan et al., 2004). Cultural differences also influence how social withdrawal is perceived, both by parents and the school system. Studies have indicated that, in Canada, shyness in children is viewed as problematic – however shy Chinese children are viewed as more mature and developed, through inhibition, restraint and maturity (Rubin et al., 2003). These cultural differences present problems when attempting to assess social withdrawal across nations and countries, since the evaluations of child behaviours are heavily dependent of the context in which the behaviour is displayed.

Studies indicate that social withdrawal is a risk factor for psychosocial maladjustment (Rubin et al., 2003), predicts internalizing problems in early adolescence such as depression and loneliness (Boivin, Hymel & Bukowski, 1995) and that shy-withdrawn children more rarely initiate contact with their peers (Coplan, Gavinski-Molina, Lagacé-Séguin & Whichman, 2001). Additionally, research (e.g. Rubin et al., 2003) suggests that socially withdrawn boys are more at risk than socially withdrawn girls. Shy behaviours seem to be viewed as more acceptable when displayed by girls than for boys, in Western societies. In school, it has been argued that teachers encourage outspoken behaviour for boys, but not for girls. As such, quiet and shy behaviours could be viewed as more fitting, and more representative of social skills, for girls than it is for boys, which puts boys at an increased risk of maladaptive outcomes in childhood and into adolescence (Crozier, 2001; Stevenson-Hinde & Glover, 1996). Because Western culture and society tend to value shyness in girls positively and shyness in boys negatively; it is more culturally accepted for girls to be quiet than it is for boys. This may lead to socially withdrawn boys experiencing more negative interaction, in Western society (Coplan et al., 2004).

It is important for teachers in elementary school to identify children that show signs of social withdrawal and try to understand the underlying causes of this behaviour. This could help prevent the potential long-term negative implications of social withdrawal. The Norwegian school system is responsible for promoting health, wellbeing and learning in its physical and psychosocial learning environments (The Royal Ministry of Education, Research and Church Affairs, 2006). As such, identifying and aiding children that are socially withdrawn is a preventive measure that could help reduce the number of children that develop mental health issues later in childhood and adolescence. Mental health issues and low social competence could be a risk factor for students that require special needs education, and other means of aid, in addition to the ordinary education of the classroom. As such, paying close attention to children who seem socially withdrawn could prevent the possible need for these children to attend special needs education, which could help further negate the potentially negative effects of social withdrawal, and help incorporate these children in their respective classroom environments.

### **Hypotheses**

The present study proposed the possibility of a bi-directional relationship between social withdrawal and academic achievement, and that the relationship showed differences when analysing girls and boys separately. As such, three primary hypotheses were formulated:

H1) Increased levels of Social Withdrawal leads to decreased levels of Academic Achievement.

H2) Increased levels of Academic Achievement leads to decreased levels of Social Withdrawal.

H3) The above hypotheses are different across genders.

H1 entangles the question: does poor social functioning forestall a decline in academic performance? Shyness in children could negatively affect their performance in school, due to shyness being connected to anxiousness and other psychological issues (Rubin et al., 2003). A cause for conflicted shyness in children is suggested to be an approach-avoidance conflict. Shy children could want to interact with their peers (high social-approach motivation), but they could at the same time be inhibited by social fear/anxiety (high social-avoidance motivation). This shyness has been shown to link with maladjustment across the lifespan, e.g. lower self-esteem, display of less socially competent and prosocial behaviours and development of anxiety problems (Coplan et al., 2004). These problems could further extent outwards from the child and impact their ability to participate in the social life of school, learn and master school, and therefore decrease their academic performance.

H2 entangles a second question: does increased academic performance predict increased social functioning? Experiencing mastery, which is reflected in increased levels of academic achievement, could help decrease the amount of shyness in a child, due to feelings of mastery and accomplishment in school. Being academically proficient and mastering the contents of elementary school could decrease the amount of shyness in a child, though increased self-esteem. Achieving a feeling of accomplishment and mastery could heighten a child's self-esteem, and reduce the child's social-avoidance motivation, and consequently reduce their levels of social withdrawal.

H3 hypothesizes that H1 and H2 would be different for boys and girls, when analysed separately. It has been shown that girls and boys are different with it comes to academic proficiency, and that boys tend to underachieve in school (Hartley & Sutton, 2013). Girls have also been suggested to be higher rated than boys on academic engagement (Lam et al. (2012). Girls and boys are also different when it comes to social withdrawal, and how different solitary behaviours are perceived differently for boys and girls (Coplan et al., 2001).

We expected that these differences across genders in academic proficiency and -engagement and social withdrawal result in differences in the relationship between social withdrawal and academic achievement when analysing boys and girls separately.

### **Method and Scientific Theory**

#### **Longitudinal studies**

Longitudinal studies are studies that look at a set of variables over extended periods of time. These studies can take place over a period of weeks, months, years or decades.

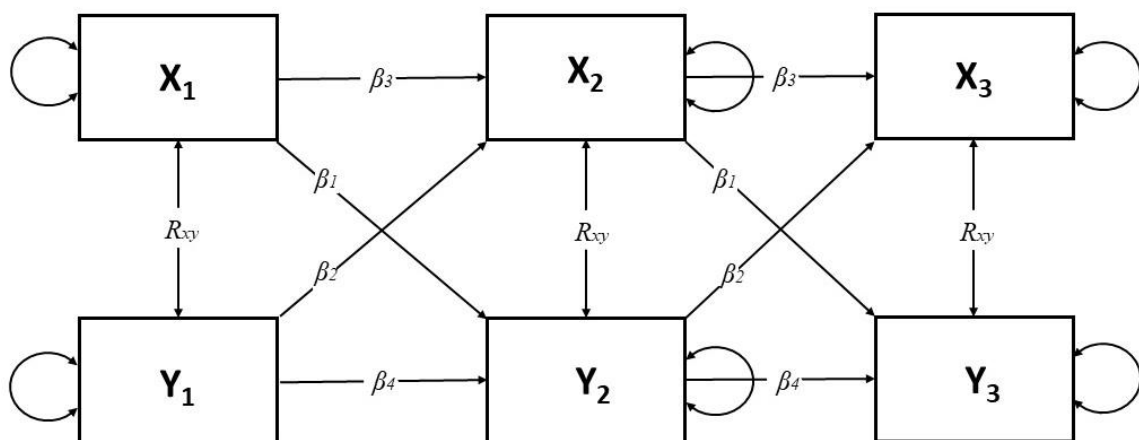
Longitudinal studies have three primary strengths, the first of which is the ability to assess covariance in the variables, by evaluating how they develop over time. Secondly, longitudinal studies allow researchers to explain potential causality between variables, due to the many points in time the measurements are made. This is particularly in contrast to cross-sectional studies, that have lesser ability to predict the direction of causality. Finally, longitudinal studies also provide assessments of stability in variables, through looking at the relationship between different measurement points in the same variables (Menard, 1991). These strengths combined make longitudinal studies excellent in assessing developmental and lifespan issues in the test population, which in the present study is the development of the relationship between academic achievement and social withdrawal from ages 6 to 10. The Trondheim Early Secure Study is a cohort study, and all participants are chosen to participate based on birth year and geographic location. As such, it is thought that all differences found within the study are due to environmental factors.

#### **Structural Equation Modeling and Cross-Lagged Panel Analyses**

Structural Equation Modeling (SEM) is a statistical model that combines path analysis with factor analysis (Kline, 2005). In the present study, social withdrawal and academic achievement are latent constructs, that were defined through observed variables. The Child

Social Preference Scale (CSPS) (Coplan et al., 2004) was used to measure social withdrawal in the study population, and the Teacher Report Form (TRF) (Achenbach & Rescorla, 2000) was used to measure academic achievement. Both social withdrawal and academic achievement are latent variables, unable to be directly measured and observed. SEM gives the researcher the ability to locate relationships between unobservable constructs (latent variables) from observed variables.

In the core of Cross-lagged Panel Analyses we find the idea that the value of a variable at a specific point in time ( $t$ ) is explained by the value of said variable at a previous time ( $t-1$ ). Cross-lagged analyses are commonly used in cohort studies, studies where a large population is assessed repeatedly at different points in time. This enables the researchers to prove the direction of causality between variables  $X$  and  $Y$ . Cross-lagged models contain both estimates and comparisons of correlational and regression coefficients. The underlying logic of these analyses is that if  $X$  is the reason for  $Y$ , then  $X_1$  should be related to  $Y_2$  (Burkholder & Harlow, 2003). The figure below visualizes the core logic of Cross-Lagged analyses.



**Reliability and validity**

The reliability of a measurement indicates whether an individual's scale score is a good estimate of the individual's true score and is commonly operationalized as the degree to which observed score variance reflects true score variance. There are different methods that seek to estimate the reliability of measurements, one of which is measurements of internal consistency: Cronbach's alpha. Furr (2011) suggests that satisfactory alpha-scores range from .70 - .95.

The Child Social Preference Scale (CSPS) (Coplan et al., 2004) was used to assess Social Withdrawal in the study population. The 14-item questionnaire is designed to distinguish between Conflicted Shyness and Social Disinterest, two dimensions of Social Withdrawal, in children. Only the Conflicted Shyness-dimension was assessed in the present study, because this was the only dimension in the data material collected for the Trondheim Early Secure Study. Acceptable alpha values were found for the construct: .87 at age 6, .82 at age 8 and .76 at age 10. The CSPS-instrument has been checked for validity in previous studies (e.g. Coplan et al., 2004), and these have shown that the scale showed acceptable internal consistencies.

The Teacher Report Form (TRF) (Achenbach & Rescorla, 2000) was used to assess academic achievement in the study population. The child's writing proficiency, reading proficiency and mathematical proficiency were collected through teacher reports. Acceptable alpha values were found for this construct also: .89 at age 6, .85 at age 8 and .89 at age 10. The Teacher Report Form has also been validated and standardized through large cohort studies in USA, and Rescorla et al., (2007) found that TRF-results across 21 countries had very similar internal consistencies.

According to Kleven (2008), there are four types of validity within the quantitative research tradition. These are labelled in the 'Cook and Campbell's validity system', and

comprises of construct validity, statistical conclusion validity, internal validity and external validity. Construct validity refers to the degree to which empirical findings and theory confirm the interpretations found in test scores entailed by the proposed uses of a scale. Does the test measure that which it sets out to measure? Both CSPS and the TRF have been previously reported to have satisfactory construct validity (CSPS: Coplan et al., 2004) (TRF: Achenbach & Rescorla, 2000; Rescorla et al., 2007). Statistical conclusion validity is justified by tests of significance and effect size. In the present study, findings are only interpreted if significant at the .01-level, and the statistical conclusion validity is therefore thought to be acceptable. Internal validity is the evaluation of the likelihood of alternative causal interpretations. In the research presented here, a causal relationship is suggested between social withdrawal and academic achievement. This is explained in greater detail in the attached article. Primarily, the use of longitudinal research design strengthens this interpretation, since longitudinal research reduces the likelihood of coincidences affecting the end result of the analyses. Second, Structural Equation Modeling uses both regression and factor analyses, which further strengthens our results ability to interpret causal relationships in complex theoretical structures (Burkholder & Harlow, 2003). Thus, the causal interpretation done in the present study is thought to be good. External validity is the validity of applying the conclusions of a scientific study to a context outside of the study itself; to what extent one can generalize the findings in the study. All children born in Trondheim in 2003 and 2004 (3456 children) were invited to participate in the Trondheim Early Secure Study, 1250 were drawn to participate in the first wave of assessment (T1) in 2007. Threats to generalization include generalization across countries, continents and cultures. Social withdrawal has shown to be different across cultures (Rubin et al., 2003). Therefore, generalizations must be made carefully. However, due to the large population sample in the TESS-study, there is reason to

argue that the results presented in this study can – at minimum – be generalized to the whole of Norway.

### **Main findings**

Cross-sectional analyses in the present study showed that students with higher ratings of social withdrawal generally were rated lower on academic achievement, consistent across all measurement points. This indicates that children who are rated as socially withdrawn are also rated as poorer performing in the academic context of school. This is in line with previous research, which has shown that socially withdrawn children are an at-risk group when it comes to performance in school (e. g. Wentzel, 1991).

Second, cross-lagged analyses showed that higher academic achievement predicted attenuated development in social withdrawal. Children who experience improved academic performance have reduced development in their reported levels of social withdrawal, or in other words; improved academic performance predicts improved social functioning. In the attached article, this relationship is explained through increased feelings of mastery, and feelings of social acceptance. Being perceived by others as academically proficient is imagined influencing children's self-esteem and feelings of self-worth, which in turn accelerates their motivation to participate in social interactions with their peers.

Third, this effect was evident both among boys and girls, but at different time periods. For boys, this relationship was found to be significant between ages 8-10. However, for girls, the same relationship was found to be significant between ages 6-8. This difference across genders is, in the present study, explained through girls having an increased concern with their own academic performances. Studies have shown that girls, generally, perform better than boys in school (Hartley & Sutton, 2013), and this may enhance the impact of school performance on perceived social status for girls.



**Implications**

The mental health and wellbeing of children is a frequent area of discussion and research, and has, especially over the past years, been part of the public discussion regarding the Norwegian school system. Good mental health is at the core of prerequisites necessary for mastering school, and social withdrawal is a risk factor of impaired mental health and academic performance of children and adolescents. One primary goal for all teachers and educator is that children should experience mastery, well-being and joy in school. It is important for children to master the social environment of school, through having friends, playmates, being able to partake in cooperation in the classroom, and interacting with adults and other children in a beneficial way. It is also important, to an increasing degree, for children to master and feel competent in the academic aspects of school; being knowledgeable and competent, and to receive praise and credit from teachers and parents. These two aspects of school, the social and academic spheres, are vitally important for children, and having a sense of self-accomplishment and success in these spheres is at the core of school's responsibility.

**Implications for the field of Special Education**

This article is written as my Master of Sciences in Special Education. Special Education is a field of pedagogics concerned with children, youths and adults with special needs in school, preschool and other areas of life. Special education includes learning disabilities (such as dyslexia, dyscalculia), communication, emotional and behavioural disorders (such as ADHD) and developmental disabilities (such as autism or intellectual disabilities). Social withdrawal, or shyness, lack of sociability, and lack of motivation for peer interaction is a challenge for some children in school today. As reported in my article, these characteristics are risk factors for various challenges for the affected children, such as depression, loneliness and a decline in academic performance. My master's thesis presents a

preventive perspective on these challenges; through identifying and assessing these risk factors in children, the teacher, and other educators, can minimize and/or prevent the negative outcomes of these risk factors. Being a socially withdrawn child is not necessarily a risk factor in itself, but if the school system fails to identify social withdrawal in children, and further fails to prevent the reported risks associated with it, we are at risk of having increased numbers of children whose benefit for being in school is severely reduced. The school system is responsible for promoting health, wellbeing and academic competence for all children, and making sure socially withdrawn children have equal opportunities as other children is of key significance. I hope my master's thesis can bring awareness of how social withdrawal can affect children and reduce both their enjoyment and benefit of being in school.

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Social Withdrawal and Academic Achievement:  
Longitudinal Relations Through Ages 6, 8, and 10.

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### **Abstract**

Studies have shown that socially withdrawn children perform poorer academically than their peers in childhood and adolescence. What remains uncertain, however, is the causal interplay of these factors over time. On the one hand, increased social withdrawal may predict poorer academic performance over time, but on the other hand, better academic performance may predict attenuated social withdrawal. Furthermore, since girls and boys differ substantially in their social preferences, gender effects may be present. Hence, in the present longitudinal study comprising 997 Norwegian children, rated by teachers on their social withdrawal and academic achievement at ages 6, 8 and 10, we tested the cross-lagged effects of these factors over these three measure points. First, cross-sectional analyses showed that students with higher ratings of social withdrawal generally were rated lower on academic achievement, consistent across all measurement points. Second, cross-lagged analyses showed that higher academic achievement predicted attenuated development in social withdrawal. Third, this effect was evident both among boys and girls, but at different time periods. Results are discussed in light of need-to-belong and self-esteem theory, and limitations to the study are illuminated.

*Keywords:* social withdrawal, academic achievements, social competence, peer interaction, self-esteem, social acceptance.



## **Introduction**

Well-functioning peer relations are important in nurturing children's social development and psychological health (Rubin & Asendorpf, 2010). Social exclusion in early school years predicts e.g. attenuated development of self-regulation (Stenseng, Belsky, Skalicka, & Wichstrøm, 2015) and more ADHD-symptoms and aggression (Stenseng, Belsky, Skalicka, & Wichstrøm, 2016). Accordingly, poor peer relations are also linked to academic problems (Parker & Asher, 1987). Cross-sectional studies have repeatedly found that these phenomena are overlapping (e.g. Wentzel, 1991; Crozier, 1995; Wentzel & Caldwell, 1997; Fantuzzo, Bulotsky, McDermott, Mosca & Lutz, 2003), but few studies have examined how social functioning and academic achievements affect each other over time in primary school years. However, of relevance, Dominguez, Vitello, Maier & Greenfield (2010) examined the learning trajectories of preschool children over a one-year period and suggested that the children's shyness-scores were negatively associated with baseline academic achievement-scores. DeRosier, Kupersmidt & Patterson (1994) found that, in a study of 622 second- through fourth-grade children, peer rejection predicted later academic and behavioural problems. However, at present, no known studies have tried to entangle the following questions: does poor social functioning forestall a decline in academic performance, or secondly; does increased academic performance predict improved social functioning in primary school? And furthermore, if such patterns exist, are they different for boys and girls? In the current report, describing a 3-wave and 6-year longitudinal study conducted on children in primary school, we shed some more light on these questions.

## **Social Interaction and Knowledge Acquisition**

In line with Piaget's theory of interaction and social cognition, acquisition of knowledge has its roots in the interaction between the child and the object of the child's attention (Piaget, 1970, in Rubin & Asendorpf, 1993, p. 5). Interaction is therefore a most

central aspect of learning and the exchange of knowledge. There is a strong theoretical belief that social interaction, especially between a child and its peers, accelerates the development of mature social thinking. As children are encompassed in peer groups, they are prompted to understand the rules and norms of these groups. This understanding of norms and rules allows the child to evaluate its own social competence levels against the perceived standards of the group (Rubin & Asendorpf, 1993). Peer interaction is therefore essential for allowing the child to make self-appraisals, and to understand itself in relation to its peers. The theoretical perspectives discussed by Rubin and Asendorpf seem clear in suggesting that interactive experiences are central in the normal social-cognitive and social behavioural development, and that “. . . peer interaction is a highly significant developmental force” (Rubin & Asendorpf, 1993, p. 7). As such, the need to create and maintain relationships with others could be imagined to be essential for the exchange of knowledge in school.

### **The Need to Belong, Social Competence and Self-esteem**

Baumeister and Leary (1995) presented need-to-belong-theory, where the central idea is that individuals have a fundamental and strong motivation to create and maintain a certain minimum of social relationships. This need to belong is also found in research on motivational theory by Abraham Maslow, where the need to belong is presented as one of 5 human needs in the hierarchy of needs, together with physiological needs, safety, self-esteem and self-actualization (Maslow, 1943). As such, the need to belong is presented as a fundamental part of psychological motivation, and a most central driving force in what controls the behaviour of human beings. Research has suggested that the need to belong, or *belongingness*, is linked with increased performance and enjoyment of school. Wentzel & Caldwell (1997) showed that peer relationships are related to academic performance in a study of sixth grade students, and Anderman and Freeman (2004) showed that belongingness to a social group can enhance the academic achievements of students.

Closely connected with the need to belong, we find the theoretical construct of social competence. Social competence is a broad construct that contains social skills, social acceptance, successful relationships with others and the functional outcomes of relationships. The functional nature of social competence is commonly accredited as the core of the construct itself: the ability to interact with others, such as other children, and adults such as teachers in a meaningful way (Rose-Krasnor, 1997; Berkovits & Baker, 2014). In most western societies, children spend an increasing amount of time in preschools and schools where they need to adjust to adults and peers almost constantly. Research has explored the link between social competence and academic performance, and the results indicate that being socially competent is a predictor of how academically proficient children are (Wentzel, 1991). “Children who are accepted by their peers or display prosocial behaviour at school tend to be high achievers, whereas social rejected and aggressive children appear to be especially at risk for academic failure” (Wentzel, 1991, p. 1066). As such, social competence is an important prerequisite for mastering the social aspects of school. It can be hypothesized that social isolation and a lack of participation in the social environment of school can result in negative consequences for the child, both socially and academically.

In need-to-belong theory, self-esteem and social acceptance are presented as the individuals’ long-term evaluations of its belongingness (Leary & Baumeister, 2000). The individual evaluates how eligible it is to maintain several long-term social relationships with its peers. All human beings, including children, seek social acceptance from their peers, and through maintaining and building these social relationships with their peers, children experience social acceptance and enhanced self-esteem. Briefly explained, self-esteem is the individual’s positive or negative attitude towards the self (Rosenberg, Schoenbach, Schooler & Rosenberg, 1995). In the context of need-to-belong theory, self-esteem is viewed as the individual’s evaluation of its ability to maintain long-term social relationships (Leary &

Baumeister, 2000). Regarding the relationship between self-esteem and academic performance, a literature review by Baumeister, Campbell, Krueger & Vohs (2003) suggests that self-esteem should be viewed as an outcome of academic performance rather than a cause for it. They further suggest that self-esteem seems more likely to increase academic persistence and engagement, which can be connected to self-efficacy; the child's confidence that he or she can reach certain performance levels (Bandura, 1982). The research of Uchida, Michael and Mori (2018) support the idea that increased self-efficacy and self-esteem can help increase students' academic engagement, which in turn may positively influence their academic achievements. Their real-world experiment on 267 Japanese junior high students showed signs that, for males specifically, increased self-efficacy resulted in increased academic achievements 1 year later.

### **Social Prerequisites for Academic Achievements**

Wentzel (1991) looked at the relationship between academic performance and three aspects of social competence; socially responsible behaviour, sociometric status and self-regulatory processes. In a sample of 423 12- and 13-year olds, multiple regression analyses suggested that socially responsible behaviour is a powerful predictor of academic achievements in the sample, and that sociometric status and self-regulatory processes strongly influence the student's display of socially responsible behaviours (Wentzel, 1991). In the school environment, meaningful social interaction and successfully engaging with peers is commonly accredited as a central aspect of mastering school, and students that have many friends and often initiate social contact with other students are perceived as more high-performing students, compared to the more socially withdrawn students (Wentzel, 1991). Difficulties with peer interaction and social initiative have also shown to be a predictor of poorer school performance in teacher-reported assessment of children that are socially withdrawn (McCroskey & Daly, 1976). Previous studies have also shown that social

withdrawal is a risk factor of psychosocial maladjustment and mental health issues, such as depression, loneliness and anxiety (e.g. Coplan, Prakash, O'Neil & Armer, 2004). Bester and Budhal (2001) suggested that high levels of social isolation are associated with low levels of self-esteem. Their research also showed that there exists a significant, negative correlation between social isolation and academic achievements. This led to the conclusion that learners who perform poorly in school are at risk of becoming socially isolated, and that learners who are academically strong are more confident and achieve higher social status among their peers (Bester & Budhal, 2001). Children have a fundamental need to belong, and their social competence influences how able they are to put this need into practice. Through mastering the social contents of school and feeling socially accepted, they experience well-being and enhanced self-esteem. Cooperation, interaction with others and engaging in social relationships are all important social prerequisites for how learning and exchange of knowledge is conducted in elementary school, and these aspects are all dependant on a child's ability to be socially competent. Children that are socially withdrawn could as such be in risk of having decreased academic achievements, a problem that can be a limiting factor in the child's future education.

### **Social Withdrawal and Academic Achievements – Underlying Mechanisms**

Given the idea that the need and ability to belong is essential for the child's learning and understanding of its social environment, absence of this need and ability is suggestive of abnormal development in the child's understanding of social interaction. Socially withdrawn children – children who avoid peer interaction and prefer solitude – can as such be at-risk children in this regard. Further reading on the theoretical and historical perspectives of social withdrawal can be found in the attached literature review. Findings by Eisenberg, Shepard, Fabes, Murphy and Guthrie (1998) and Bester and Budhal (2001) suggest that socially withdrawn behaviours in the classroom negatively affect the student's ability to learn over

time, because effective classroom participation, coping and adjustment are negatively affected by being socially withdrawn (Hall, Welsh, Bierman & Nix, 2016). There are several mechanisms that are thought to affect the relationship between Shyness and language skills, and these are summarized by Coplan and Evans (2009). Some of these mechanisms can also be adapted to explain the general academic performance of socially withdrawn children. One such mechanism is that social anxiety in shy children impairs their ability and desire to engage in the classroom. This may lead to teachers perceiving the shy student as academically poor, since lack of participation could indicate a lack of knowledge and understanding of the curricular material. Lam et al. (2012) also suggested that lack of academic engagement, that is interaction between the student and the educational environment, is a predictor of poorer academic performance. Coplan, Hughes, Bosacki and Rose-Krasnor (2011) also showed that teachers perceive hypothetically shy children as less intelligent than other students. Secondly, shy children's poorer performance on assessments of academic achievements could be a symptom of difficulties with the test situation itself, and not the competence that is assessed. Social anxiety could lead to performance anxiety, which decreases the assessed performance of the shy student (Crozier, 1995). Crozier & Hostettler (2003) did research on three test settings with shy children: face-to-face with oral replies, face-to-face with written replies and finally in a group setting with peers. They showed that the individual setting resulted in decreased performance for shy children, and that the written response-scenario made it difficult for the shy students to perform. Therefore; a test situation that appears demanding and stress-inducing for shy children may negatively impact their performance. This "competence deficit" versus "performance deficit" is commonly discussed in literature regarding the academic performances of shy children. Are the poor academic achievements of shy children a result of these poor competence, or poor performance when assessed?



### **The Present Study**

The present study uses the term academic achievements to assess a child's curricular performance in school. It should be noted that the terms academic achievements and academic performance will be used interchangeably throughout this article. Writing proficiency, reading proficiency and mathematical proficiency are combined to evaluate the children's overall academic competence. The relationship between shyness and academic achievements has been explored by researchers previously (e.g. Wentzel, 1991; Hughes & Coplan, 2010). However, research on the developmental and long-term relationship between these two aspects is lacking. The present study aims to explore the longitudinal relationship between social withdrawal and academic achievements, for children who participated in the Trondheim Early Secure Study (TESS), through ages 6, 8 and 10. Previous studies have suggested that there is a negative relationship between children who are shy and their performance in school (e.g. Wentzel, 1991). The present study aims to investigate if a decrease in social withdrawal is a potential factor of decrease in the academic achievements of socially withdrawn children. Additionally, the present study aims to explore if an increase in academic achievements can result in a decrease in social withdrawal (increased social functioning)

## **Method**

### **Participants and Procedure**

The first wave of the TESS-study took place in 2007 and 2008 (T1) and included children born in 2003 or 2004, with parents living in Trondheim, Norway. The present study uses data from the second, third and fourth waves of data collection, when the children were 6, 8 and 10 years old, first, third, and fifth grade of elementary school respectively. A total of

1250 children were recruited to join the study, of which 997 were tested at the time of study enrolment ( $M_{\text{age}} = 4.55$  years; 50.6% boys). At T1 81% of children were accompanied by their mothers, more than 99% of the children were of Western ethnic origin (e.g., Europe, United States), and 86% of these children had parents who lived together. Further reading on the procedure, recruitment and sample is presented elsewhere (Wichstrøm et al., 2012). Figure 1 shows participation rates and the flow of participants in more detail. 795 children (50.5% boys) participated in the first follow-up assessment (T2), 2 years later ( $M_{\text{age}} = 6.72$  years). This results in a longitudinal participation rate of 75.6%. In the second follow-up assessment (T3), 699 children (48.7% boys) participated ( $M_{\text{age}} = 8.80$  years). The longitudinal participation rate at T3 was 87.9%. In the third follow-up assessment (T4) 702 children (51.3% boys) participated ( $M_{\text{age}} = 10.7$  years). The longitudinal participation rate at T4 was 88.3%.

*Figure 1 here*

Teacher data was collected through questionnaires sent to primary schools at T2, T3 and T4. The response rates among teachers were 92.2% at T2, 85.8% at T3 and 82.3% at T4. Teachers had known the child for an average of 6 months at T2 and 2 ½ years at T3 and 4 years at T4. Teachers provided information on social withdrawal and academic achievements on all measurement points. The project has been approved—for each wave of data collection—by the Regional Committee for Research Ethics, Mid-Norway ([www.etikkom.no](http://www.etikkom.no); REK 4.2008.2632).

## Measures

### Social Withdrawal

The Child Social Preference Scale (CSPS) (Coplan et al., 2004) is a scale developed to assess social withdrawal (SW) among children. The CSPS-instrument is originally a two-dimensional scale containing the dimensions Conflicted Shyness and Social Disinterest. In the TESS-data only the Conflicted Shyness-dimension was available. Teachers rated each child on the dimension, consisting of seven items, with sample items such as “*The child declines social initiatives from other children because he/she is shy*” and “*The child circles other children’s play without participating*”. Teachers rated each child for each item on a 5-point Likert scale, ranging from 0 (*to a small degree*) to 5 (*to a large degree*). Acceptable internal consistency coefficients were found for the construct, with Cronbach’s alphas ranging from .87 at T2, .82 at T3 to .76 at T4.

### Academic Achievements

The Teacher Report Form (TRF) from the Achenbach System of Empirically based Assessment (ASEBA) (Achenbach & Rescorla, 2000) was used to assess academic achievements (AA), a measure of how well a child’s performance in school is. Teachers reported the child’s performance in three school subjects: reading proficiency, writing proficiency and mathematical proficiency at T2, T3 and T4. Teachers rated each of these academic proficiencies for each child on a 5-point scale, 1 (*far below grade*), 2 (*somewhat below grade*), 3 (*at grade level*), 4 (*somewhat above grade*) or 5 (*far above grade*). This teacher rating of the children reflects the long-term development of the academic achievements of the children in the classroom, as opposed to e.g. standardized tests that provide an assessment of the child’s competence at a single point in time. Acceptable internal consistency coefficients were found for the construct, with Cronbach’s alpha .89 at T2, .85 at T3 and .89 at T4.

## Results

Descriptive analyses, including mean-level differences between times of measurement and bivariate correlations from SPSS 25, are presented first in Table 1. Then, in order to test cross-lagged effects of social withdrawal and academic performance were identified in the total sample from age 6 to age 10, through age 8, we examined this by means of structural equation modelling (SEM) in *Mplus* 8.1. Finally, the SEM-model is run on girls and boys separately to detect gender differences in the sample.

*Table 1 here*

### Descriptive statistics

Paired samples t-tests showed that social withdrawal decreased significantly from age 6 ( $M = 10.86$ ) to age 8 ( $M = 9.60$ ;  $t = 2.84$ ,  $p < .01$ ), but increased from age 8 to age 10 ( $M = 9.57$ ,  $t = 4.38$ ,  $p < .001$ ). There was no difference in social withdrawal from age 6 to age 10 ( $t = 1.78$ ,  $p = .07$ ). Levels of academic achievements, the sumscore of math, reading, and writing, did not differ over time points ( $t$ 's ranging from 0.68 to 1.78,  $p$ 's  $> .05$ ).

Pearson correlations were computed to analyse bivariate associations between study variables. Table 1 displays means, standard deviations and zero-order correlations. Foremost, social withdrawal was negatively related to academic achievements at all measure points. However, social withdrawal was unrelated to gender. Girls tended to perform better in reading and writing than boys.

### Structural Equation Modeling

Cross-lagged analyses with repeated auto-regressed latent constructs were performed in *Mplus* 8.1 (Muthén & Muthén, 2018). All structural analyses were performed using the maximum likelihood estimator (MLR). Missing values were treated according to the full

information maximum likelihood procedure (FIML). Judgment of model fit was made according to the recommendations of Hu and Bentler (1999; see also Marsh, Hau, & Wen, 2004). Thresholds for good fit of a model are values above or close to .95 on the comparative fit index (CFI) and the Tucker-Lewis index (TLI). Values of the root mean squared error of approximation (RMSEA) and the standardized root mean squared residual (SRMR) are recommended to be less than .06 and .08, respectively. Item-level constraints were defined in order to control for repeated-measures invariance in social withdrawal at all three measure points. The cross-lagged model was first tested on the total sample (see Figure 1). The model had reasonable fit with the data:  $\chi^2(401, N = 841) = 1089.73.80, p < .001, CFI = .92, TLI = .92, RMSEA = .045, SRMR = .049$ . Analyses showed that better model fit could be achieved by trimming the latent constructs of social withdrawal, since some factor loadings were rather weak (item #3, lower than .60), but we chose to keep all items from the original measure. The stability of social withdrawal over measure points was moderate from age 6 to age 8 ( $\beta = .51, p < .001$ ), but rather low from age 8 from age 10 ( $\beta = .23, p < .001$ ). Notably, social withdrawal (SW) at age 6 also predicted SW at age 10, above this measure at age 8, indicating a small sleeper effect of SW ( $\beta = .25, p < .001$ ). The latent construct of academic achievements, comprising teacher-rated academic levels in reading, writing, and math, separately, showed strong factor loadings at all ages. This indicates that teachers rate the academic level of their student as rather independently of the subjects in mind, and furthermore, implies that students at these ages tend to have similar scores on different subjects. The stability of academic achievements (AA) was high across measure points, (AA, age 6  $\rightarrow$  AA, age 8:  $\beta = .76, p < .001$ ; AA, age 8  $\rightarrow$  AA, age 10:  $\beta = .70, p < .001$ ). Cross-sectional correlations showed that SW was negatively correlated with AA at age 6 ( $r = -.17, p < .01$ ) and age 10 ( $r = -.15, p < .01$ ), but not at age 8 ( $r = -.09, p = .12$ ). Based on our main hypotheses, that social withdrawal and academic achievements would affect each other over

time, we included cross-lagged effects in the model. First, we run the model for the total sample.

*Figure 2 here*

Inspections of the model paths showed that SW did not predict changes in AA over time. However, higher AA at age 8 predicted less SW at age 10. In other words, higher academic achievements at age 8 mitigated social withdrawal from age 8 to age 10 in the total sample. A similar effect was not found from age 6 to age 8 ( $\beta = -.03$   $p = .60$ ).

Next, we examined gender effects in the model through multigroup analysis. When testing the model exclusively on girls, higher AA at age 6 predicted less SW at age 8, controlled for SW at age 6, whereas there was no such effect from age 8 to age 10.

*Figure 3 here*

The Satorra-Bentler chi-square test (Satorra & Bentler, 2001) showed that this gender difference was significant ( $\Delta\chi^2 = .4.62$ ,  $p = .03$ ). When testing the model on boys, higher AA at age 8 predicted attenuated social withdrawal from age 8 to age 10. However, the Satorra-Bentler test showed that this effect was not significantly different from that among girls ( $\Delta\chi^2 = .1.42$ ,  $p = .23$ ), although the path did not achieve significance in the sample of girls.

*Figure 4 here*

To sum up, social withdrawal and academic achievements is (negatively) associated at these ages, although modestly. Higher academic achievements do forestall less social

withdrawal over time, both among boys and girls, but at different developmental stages. On the other hand, social withdrawal does not predict academic achievements, neither in the positive or negative direction. Notably, no bi-directional longitudinal relations, or cascade effects, were found in the current analyses.

### Discussion

The primary goal of the current study was to examine the longitudinal relationships between social withdrawal and academic achievements for children partaking in the TESS-study, across a 6-year period, from first grade, through third grade and finally in fifth grade in elementary school. Two antagonistic causal directions of this interplay were proposed: does poor social functioning predict a decline in academic performance, and secondly; does an increase in academic performance predict improved social functioning in primary school?

First, we found that social withdrawal was negatively related to academic achievements in the study population at all time points. Of notice, this relationship has been found in several previous cross-sectional studies (e.g. Wentzel, 1991; Crozier, 1995; Wentzel & Caldwell, 1997; Fantuzzo, Bulotsky, McDermott, Mosca & Lutz, 2003; Coplan, Gavinski-Molina, Lagacé-Séguin & Whichman, 2001). Several mechanisms may be the underlying reason for this negative association. As previously discussed in this article, Piaget believed that acquisition of knowledge is a product of peer interaction (Piaget, 1970, in Rubin & Asendorpf, 1993, p. 5). Because shy children are avoidant of peer interaction, they are at risk of showing a lack of academic engagement and participation in school, which may result in a decrease in teacher ratings of academic performance (Hughes & Coplan, 2010). Teaching methods such as oral presentations, group projects and oral activity/classroom discussion may prove challenging for children inhibited by anxiousness or fear of expressing themselves. The formal education system in many Western countries have these kinds of oral activities as a

central teaching method, and this could be one of the challenges shy children encounter in school. “Given the interactive and social nature of early learning, these children might have a harder time acquiring the learning skills necessary for successful engagement in the preschool classroom” (Dominquez et al., 2010, p. 43). As discussed previously, what remains unclear is whether this is caused by a performance deficit or a knowledge deficit in the child.

Second, longitudinal analyses showed that increased academic achievements at 8 years predicted a decrease in social withdrawal at age 10. In other words, students that perform well in school at this age have a reduction in teacher-rated shyness two years later. This indicates that increased levels of academic performance in elementary school could result in improved social functioning. Social competence, self-esteem and self-efficacy have all been suggested to play a part in the academic performances of children (Bandura, 1982; Wentzel, 1991; Uchida et al., 2018), and it may be imagined that this relationship goes both ways: academic performance may also influence the social acceptance and self-esteem of students. The fundamental need to achieve social acceptance is at the centre of need-to-belong theory (Baumeister & Leary, 1995). Students that perform well in school could be externally viewed by their peers (students, teachers and parents) as successful, which in turn enhances the individuals perceived levels of social acceptance. This could further accelerate their interest and motivation to interact with their peers, which has been shown to link with improvements of academic achievements (Wentzel & Caldwell, 1997). A cycle of positive events could explain the findings of the present study: the cycle begins with an increase in academic achievements, which boosts the students’ self-esteem, social acceptance and motivation for peer interaction. This increase in self-esteem and social acceptance could reduce the child’s level of shyness, which in turn affects both the social and the academic aspects of school, through an increased interest in play and other social activities, and a decreased anxiety when facing oral and collaborative tasks in the classroom. As previously reported, Bester and



Budhal (2001) showed that learners who are academically strong are more confident and achieve higher social acceptance among their peers, compared to their academically weaker counterparts (Bester & Budhal, 2001). This interaction between increased academic performance and increased social acceptance, self-esteem and peer interaction could account for the decrease in teacher rated shyness 2 years later.

Third, the present study did not find that low social withdrawal scores predict an increase in academic achievements, contrary to our initial hypotheses. This indicates that students that experience an increase in their social functioning do not experience an increase in their academic performance levels; social withdrawal and academic achievements do not have a bi-directional relationship. One possible explanation for this lack of bi-directionality could be that children are more aware of changes to their levels of academic achievements, and that increased mastery of school is more apparent/explicit for children than improved social functioning. Children may view social withdrawal as an unchangeable characteristic trait of themselves, and academic achievements as an influenceable proficiency, through factors such as effort, interest and peer support. Children are often evaluated in the classroom, and children are made aware of their academic performances through teacher and peer feedback, praise and credit. Because of this “explicit” nature of academic performance and “hidden” nature of social functioning, it could be imagined that decreased levels of social withdrawal fail to have impact on the child’s academic achievements. However, no support has been found for these claims in previously conducted research, and studies that entangle this relationship remain unknown to the author at present time. Additionally, our measurements of social withdrawal and academic achievements respectively could influence the lack of bi-directionality. The stability of social withdrawal (age 6 to age 8:  $\beta = .51$ , and age 8 to 10:  $\beta = .23$ ) is lower than that of academic achievements (age 6 to age 8:  $\beta = .76$  and age 8 to age 10:  $\beta = .70$ ) and this could indicate that our measure of academic achievements

measures changes in the child's academic performance better than our measure of social withdrawal measures changes in the child's social functioning.

### **Gender differences**

The present study also investigated tested the cross-lagged model on boys and girls separately. These analyses showed that increased ratings of academic achievements predict a decrease in social withdrawal at an earlier age for girls than it does for boys. For girls, this relationship was present between ages 6-8, and at ages 8-10 for boys. Hughes and Coplan (2010) found that *academic engagement* – interaction between the student and the educational environment – partially mediated the relationship between shyness and teacher ratings of academic achievements. The level of academic engagement has also been suggested to be different between genders: Lam et. al. (2012) showed that girls reported higher engagement in school and higher levels of teacher, parent and peer support than boys. As such, it may be imagined that girls are more engaged and active in the school environment from an early age, which can be explained by girls placing higher value on their academic achievements than boys do. Studies have also shown that the academic performances of girls are, generally, superior than those of boys (Hartley & Sutton, 2013). This could further support the notion that girls are more engaged and concerned with their own academic performance from early school years than boys are.

In summary; elementary school children who are rated as socially withdrawn experience decreased levels of academic performance across all measurement points. This is in line with previous research, that also suggest that social withdrawal or shyness in children is a risk factor for poorer levels of academic achievements (DeRosier et al.,1994; Hughes & Coplan, 2010; Wentzel, 1991). The present study adds to the existing literature that indicates that there exists a negative relationship between social withdrawal and academic achievements in elementary school aged children. Additionally; the longitudinal analyses in

the present study found that girls that experience increases in academic achievements at 6 years old have their levels of social withdrawal reduced at age 8. This relationship is also present for boys, but from 8 to 10 years of age. Previous studies have not fully explored how social withdrawal and academic achievements interact with each other through elementary school. Some longitudinal studies have explored some aspects of this relationship in preschool and early elementary school years (e.g. DeRosier et al., 1994; Dominguez et al., 2010), and the results of the present study are consistent with the idea that socially withdrawn children (children who are shy, or experience peer rejection in different forms) are at risk of experiencing a decrease in their levels of academic performance through elementary school.

### **Limitations and Future Research**

The present study presents some valuable contributions to the literature regarding the academic achievements of socially withdrawn children, but some limitations in the present study must be discussed. All measures in the present study are teacher ratings of the children involved and are as such prone to shared method variance. Research has shown that teachers tend to rate the academic performance of extrovert children more highly than those of introvert children (McCroskey & Daly, 1976) and that hypothetically shy students are perceived as less intelligent than other students (Coplan et al., 2011). There is a need for future research that replicate the procedures of the present study, but with other sources of data as a supplement to the already existing teacher ratings. Secondly, the present study has not considered potential background variables, such as family, classroom, peer and teacher - variables that could all influence the academic performance of socially withdrawn children. Thirdly, the present study has only assessed the Conflicted Shyness-dimension of social withdrawal, and not the other dimensions of social withdrawal; Social Disinterest and Active Isolation. These are two different dimensions of social withdrawal that may also affect the child's ability to perform in the academic and social context of school, and in research these

theoretical sub-dimensions of social withdrawal, together with Shyness, make up the social withdrawal-construct (Coplan et al.,2004).

In future research, there is a need for multi-method assessments of shy children, such as observations and interview of the children in question. Case studies could provide valuable perspectives on how academic achievements and social withdrawal develop over time in individuals, and this might also provide valuable evaluations of the intervention efforts potentially put in place for socially withdrawn children.

### **Implications and Conclusions**

Good mental health is at the core of prerequisites necessary for mastering school, and social withdrawal is a risk factor of impaired mental health and academic performance of children and adolescents. One primary goal for all teachers and educator should be to ensure that children experience mastery, well-being and joy in school. This applies to both children who are socially withdrawn, and children who are not. It is important for children to master the social environment of school, through having friends, playmates, being able to partake in cooperation in the classroom, and interacting with adults and other children in a beneficial way. This may affect their academic performances positively. It is also important, to an increasing degree, for children to master and feel competent in the academic aspects of school; being knowledgeable and competent, and to receive praise and credit from teachers and parents. This may increase their feelings of social acceptance and value. These two aspects of school, the social and academic spheres, are vitally important for the outcome children have of school and having a sense of self-accomplishment and success in these spheres is at the core of school's responsibility.

The findings presented in the present study is also of educational relevance to teachers and other educators involved in special education, since assessment and evaluation of a child's performance in school is highly relevant in making decisions regarding the quality of

the child's instruction in school. In elementary school, a child is commonly evaluated based on how he or she performs compared to the age mean, and this is often done in individual assessments of the child's competence. Crozier and Hostettler (2003) suggested that shy children are more comfortable being tested in a group-environment, as this might relieve the feeling of being the centre of attention, which is suggested as a source of anxiety for shy children. Acknowledging that socially withdrawn children are prone to perform more poorly than their peers in certain test situations may suggest that there is a need to reconsider how these children are evaluated in school in order to allow them to truly demonstrate their own levels of competence. "...it could be argued that anxious children demonstrate deficits in academic performance but not knowledge." (Coplan et al., 2001). Social competence is viewed as a prerequisite for mastering the academic contents of school, and research has suggested that teachers and parents should make sure that children experience success in academic activities. This can in turn help decrease their chances of becoming socially isolated (Bester & Budhal, 2001). In special needs teaching social competence is commonly viewed as a prerequisite for mastering the contents of school. The present study suggests that children who receive special needs teaching can experience increased feelings of mastery of school through mastering academic aspect of school, and through providing socially withdrawn children the opportunity to feel competent and skilled in the curricular activities of school, their self-esteem could be boosted, and in turn this opens the door to increased levels of peer interaction. And, as previously reported in the present study, peer interaction is a most central aspect of both social and academic competence in school today.

In conclusion, the findings presented in the present study provide valuable additions to the literature regarding relationship between social withdrawal and academic achievements in children through elementary school years. Further studies on the relationship in question is needed, in order to facilitate successful interventions from teachers that promote peer

interaction, reduce social withdrawal – and increase academic success for socially withdrawn children.

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Tables

Table 1. Descriptive statistics and Pearson correlations between variables.

Variable name	M	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender recorded <sup>1</sup>	1,49	,500	1040	1												
2. Social Withdrawal age 6	10,41	4,37	759	,000	1											
3. Reading age 6	3,30	,916	751	,137**	-,144**	1										
4. Writing age 6	3,22	,862	749	,219**	-,171**	,814**	1									
5. Maths age 6	3,34	,772	750	-,052	-,158**	,677**	,670**	1								
6. Social Withdrawal age 8	9,58	3,58	605	-0,11	,447**	-,032	-,088*	-,105*	1							
7. Reading age 8	3,36	1,021	666	,135**	-,080	,651**	,568**	,469**	-,052	1						
8. Writing age 8	3,22	,938	666	,301**	-,108**	,584**	,608**	,420**	-,112**	,773**	1					
9. Maths age 8	3,36	,927	666	-,025	-,107**	,459**	,480**	,551**	-,138**	,596**	,593**	1				
10. Social Withdrawal age 10	10,52	4,41	656	,016	,349**	-,136**	-,136**	-,133**	,345**	-,148**	-,152**	-,210**	1			
11. Reading age 10	3,32	1,008	652	,095*	-,059	,528**	,481**	,413**	-,092*	,680**	,586**	,513**	-,191**	1		
12. Writing age 10	3,20	,952	651	,221**	-,100*	,573**	,549**	,433**	-,083	,632**	,645**	,509**	-,198**	,812**	1	
13. Maths age 10	3,31	,955	648	-,037	-,105*	,480**	,451**	,501**	-,126**	,526**	,492**	,672**	-,271**	,687**	,690**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2 tailed).

<sup>1</sup>: Boys=1, girls=2

Figures

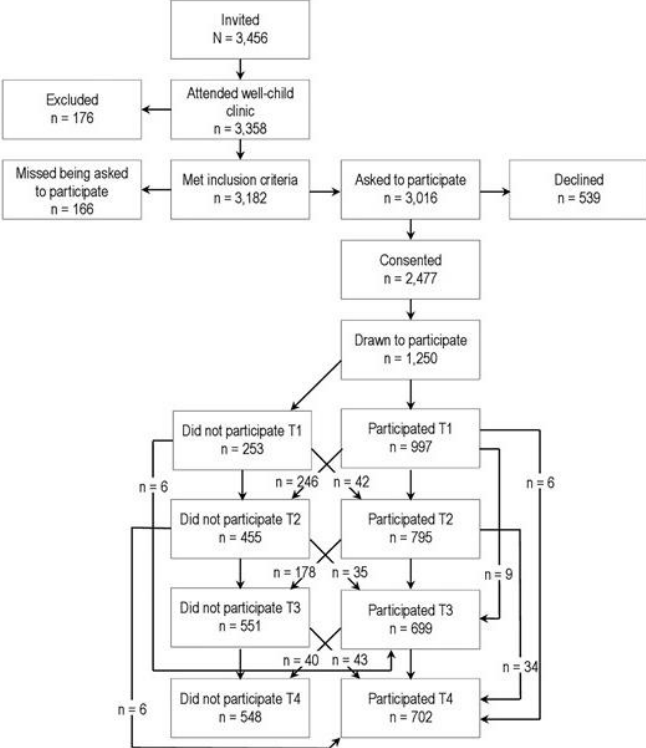


Figure 1: Procedure and flow of participants.

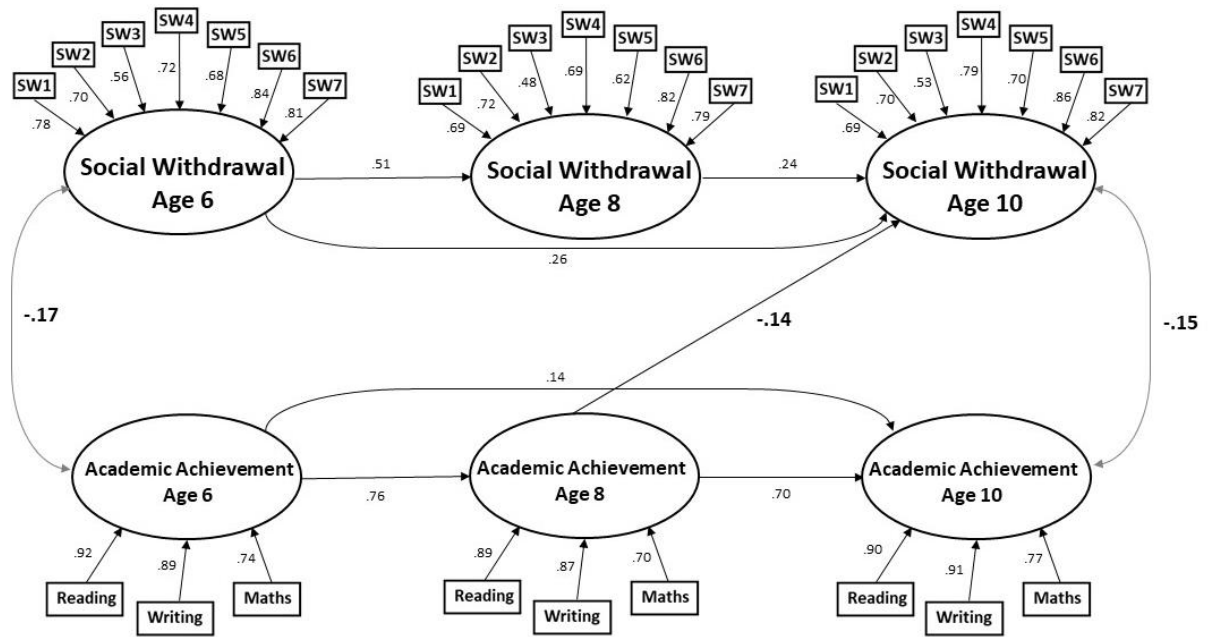


Figure 2: Cross-lagged panel model of Social Withdrawal and Academic Achievement at ages 6, 8 and 10, for the population. The path coefficients are standardized regression weights. All paths shown are significant at the .01-level.

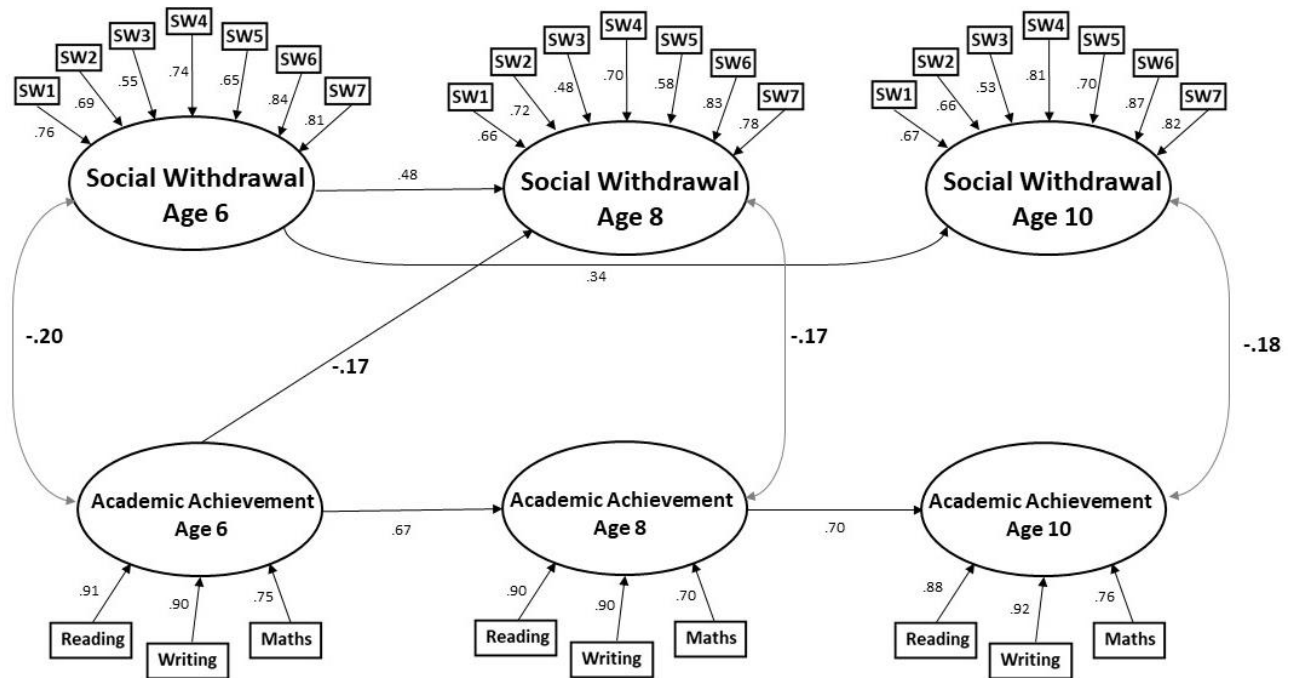


Figure 3: Cross-lagged panel model of Social Withdrawal and Academic Achievement at ages 6, 8 and 10 for girls separately. The path coefficients are standardized regression weights. All paths shown are significant at the .01-level.

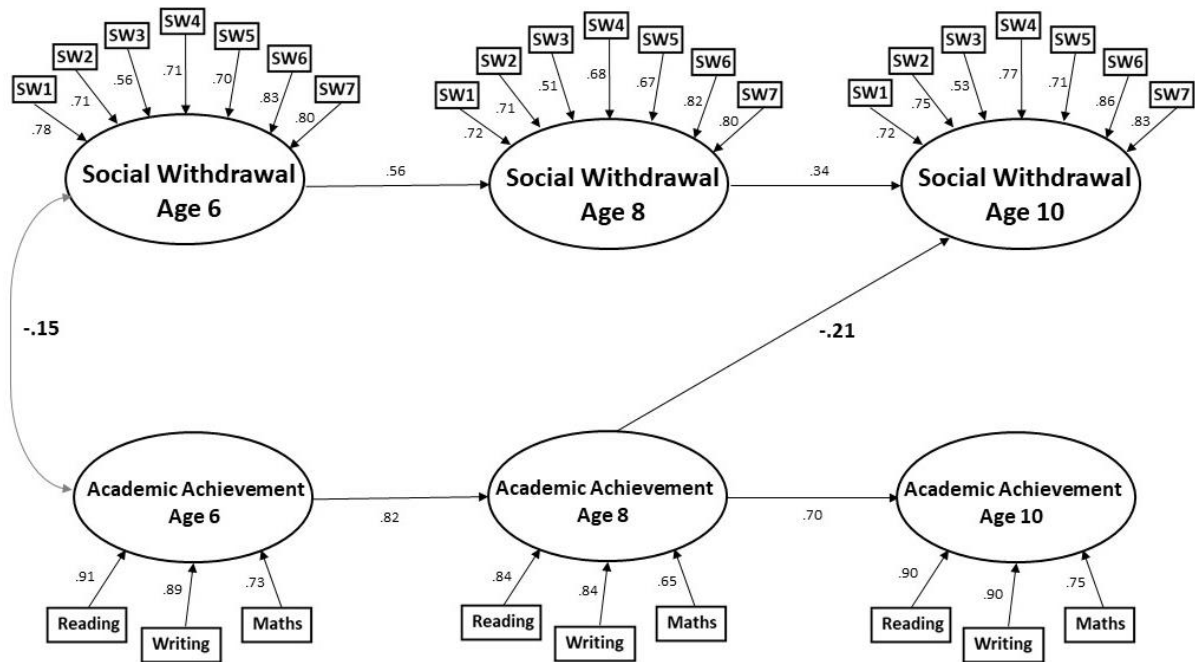


Figure 4: Cross-lagged panel model of Social Withdrawal and Academic Achievement at ages 6, 8 and 10 for boys separately. The path coefficients are standardized regression weights. All paths shown are significant at the .01-level.



