The relative age effect on self-esteem in the academic setting

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Abstract

A few studies have attempted to examine whether children’s low self-esteem is partially explained by being relatively younger than their peers. In the present study this relative age effect on self-esteem is hypothesized to be mediated by children’s relationships to their teachers and the children’s performance in school. This study is based on nationally representative data from the Korean Youth Panel Survey. A total of 2,844 Korean fourth graders ($M$ age = 9.86, $SD = 0.35$; 53.6% male) self reported their self-esteem, student-teacher relationships and academic achievement. Structural equation modeling revealed that both student-teacher relationships and academic achievement served as significant mediators in the relative age effect on self-esteem, even after family socioeconomic status was controlled for. The older children in the classroom formed higher quality student-teacher relationships and performed better in school, thereby ending up with higher self-esteem relative to their peers. These results may be used as guidance when creating intervention programs aiming to improve children’s SE and prevent negative development.

Abstrakt

Ett par studier har undersökt om barns låga självkänsla delvis förklaras av att vara relativt yngre än sina klasskamrater. I denna studie antas barns relationer till sina lärare samt barns prestationer i skolan vara medierande faktorer för den beskrivna effekten av relativ ålder på barns självkänsla. Studien använder nationellt representativt data från Korean Youth Panel Survey. Sammanlagt 2,844 koreanska fjärdeklassare ($M$ ålder = 9,86, $SD = 0,35$; 53.6% pojkar) skattade sin självkänsla, deras relationer till lärare och deras prestation i skolan. Strukturell ekvationsmodellering visade att både relationer till lärare och prestation i skolan var signifikanta medierande faktorer för effekten av relativ ålder på barns självkänsla. Detta även när familjens socioekonomiska status kontrollerats för. De relativt äldre barnen byggde relationer av högre kvalitet med sina lärare samt presterade bättre i skolan och fick därmed högre självkänsla än deras klasskamrater. Dessa resultat kan användas som vägledning när program med syfte att förbättra barns självkänsla samt förhindra negativ utveckling ska utformas.
The relative age effect on self-esteem in the academic setting

Low self-esteem (SE) has been shown to have dire consequences for children’s lifespan development. Previous research has established a link between low SE in late childhood and increased risk for antisocial behavior, poor mental health, and worse economic prospects in adult age (Trzesniewski et al., 2006). This line of research highlights the importance of increased knowledge about the underlying factors behind children’s SE. It is likely that such factors could be found at school since children spend a considerable amount of their waking hours there. In school, the ages of students in the same grade usually vary and it is common that children are grouped into classes with an age difference of up to almost a year. Effects of being relatively younger or older than peers are commonly known as the relative age effect (RAE; Fenzel, 1992; Thompson, Barnsley, & Battle, 2004). This variance in relative age (RA) has previously been shown to affect SE, with the youngest students having the lowest SE (Fenzel 1992; Thompson et al., 2004). However, no previous study has explored possible underlying mechanisms explaining this relationship. In an attempt to fill this significant void in this area of research, the present study will investigate the mediating role of student-teacher relationships (STR) and academic achievement (AA) between RAE and SE in Korean fourth and fifth graders, using structural equation modeling (SEM), controlling for family socioeconomic status (SES).

Self-Esteem

SE is a conflated concept with many different properties. Leary and Baumeister (2000) describe it as an affectively laden self-evaluation concerning behaviors and attributes of ourselves, arguing that it does not seem to be a purely cognitive evaluation. One is not only aware of attributes that affect one’s SE, but one is also aware of associated feelings. Another property of SE is that it is subjective. One’s SE does not necessarily reflect an objective evaluation of oneself. SE can be divided into self-competence and self-liking, two intercorrelated concepts with distinct causes, consequences, and correlates (Tafarodi & Swann, 2001). SE can also be divided into defensive SE and secure SE (Kernis, 2003). Because of this diversity of definitions, to simply talk about SE without defining what is discussed is problematic as it would be unclear what exactly is being discussed. In this study, SE is defined as the degree to which the student thinks of oneself as competent, worthy, and of good character.

In attempting to explain the development of SE, the looking-glass-self theory emphasizes the role of social interactions for our conception of ourselves. According to this theory, it is by perceiving and incorporating the attitudes of others to oneself that one forms one’s self-representations, and thereby one’s SE (Yeung & Martin, 2003). In support of the looking-glass-self theory, Horberg and Chen (2010) have shown that people internalize expectations by significant others and that those internalized expectations are influencing one’s SE in future relevant situations. For example, if one grows up with a mother who values a clean house, then one may feel bad about oneself if one can not keep a tidy home as an adult. It is through one’s relationships to significant others that one forms the standards by which one evaluates oneself and bases one’s SE (Horberg & Chen, 2010). According to the
looking-glass-self theory, one should keep social relationships in mind when examining SE and personal benchmarks.

While the looking-glass-self theory only tries to explain how SE develops, sociometer theory attempts to explain the function of SE. According to sociometer theory, SE is an internal monitor that keeps track of one’s social value (Leary & Baumeister, 2000). The function of SE is to maintain and improve social acceptance by foreseeing the social implications of one’s actions and prevent one from displaying behavior that could lead to social exclusion. If one experiences rejection as a response to one’s behavior, it affects one’s SE negatively and one is less likely to repeat that behavior. The motivation behind SE according to this theory is then social adaptation (Leary, 2012). A meta-analysis showed that positive social interactions in laboratory conditions have significant positive effect on SE. It also showed that individuals with a history of chronic rejection scored significantly lower on SE than those who did not have such a history (Blacheart, Nelson, Knowles, & Baumeister 2009). In conclusion, sociometer theory further highlights the importance of social relationships for SE.

Low SE has been shown to have multiple negative effects on socioemotional and behavioral development. For example, low SE has been seen to predict eating disorders at age 15 (Mcgee & Williams, 2000), mental health problems, suicidal ideation, substance dependence, life and relationship satisfaction, and antisocial personality disorder in young adults (Boden, Fergusson, & Horwood, 2008). Along a similar vein, Erol and Orth (2011) have found that high SE is related to high sense of mastery, low risk taking, and better health. High SE is also associated with lower depression in middle school students (Robinson, Garber, & Hilsman, 1995). This make SE an important area for research.

Relative Age Effect

The RAE describes the negative effects of RA on the youngest children in groups such as school classes or sports teams (Thompson et al., 2004). This effect was first highlighted in sports when an overrepresentation of players born early in the year was found in elite sports teams (Thompson et al., 2004). This overrepresentation was then explained by the nature of competitive sports. In childhood, players born early in the year are often more mature than the players born late in the year. This gives certain advantages as physical maturation is positively associated with performance in competitive sports; therefore, maturation gets mistaken for talent which in turn often leads to favoritism from coaches (Thompson et al., 2004). As a result, age-advantaged children are regarded highly by others and gain greater self-confidence and SE, whereas younger children suffer loss of self-confidence and SE (Thompson et al. 2004). In other words, grouping children by age of entry can create an environment where some children are systematically disadvantaged which have negative effects on their SE and opportunities to develop their talents.

Being on the disadvantaged end of the RAE has also been shown to have negative consequences to one’s mental health. Studies have shown that children born late relative to their classmates are more likely to attain psychiatric diagnoses in general (Goodman, Gledhill, & Ford, 2003). RAE has also been shown to be a factor in suicide among youths in Canada.
Relative age effect on student-teacher relationships

High quality STR have been shown to have multiple positive outcomes for students. McFarland, Murray, and Phillipson (2016) found that STR was related to students' school enjoyment, social skills, and popularity. STR has also been found to correlate with a reduction of anxiety in students (Kurdi & Archambault, 2016). Some researchers have documented that STR has long-lasting consequences for child development. For example, the quality of STR in kindergarten has been shown to predict grade point average (GPA) and conduct behavior at least until eighth grade even when IQ score, gender, and ethnicity were controlled for (Hamre & Pianta, 2001). This shows the importance of high quality STR and suggests that the impact of STR on students may last longer than the relationship itself.

Both teacher and student factors have been shown to predict STR. In teachers, attachment history (Kesner, 2000), being of the same ethnicity as the student (Saft & Pianta, 2001), and low levels of teacher stress and negative affect (Yoon, 2002) were significant predictors of the quality of STR. In students, having high effortful control, the ability to inhibit inappropriate responses (Rudasill, 2011), and showing less externalizing problem behaviors (Lei, Cui, & Chiu, 2016) predicted STR with higher quality. Even though no previous study has been conducted on the RAE on STR, both externalizing problem behaviors (Miner & Clarke-Stewart, 2008) and effortful control (Simonds, Kieras, Rueda & Rothbart, 2007) have been shown to improve with age, suggesting that the older students in the classroom therefore are more likely to form high quality STR than the younger students. Thus, a RAE on STR is hypothesized in the present study.

Student-teacher relationships and students’ self-esteem

There are both theoretical and empirical support for STR being a contributing factor to SE. According to sociometer theory, SE is an internal monitor that keeps track of one's social value (Leary & Baumeister, 2000). Having high quality STR could then be a positive measure of social value, which should result in higher SE. According to the looking-glass-self theory the attitudes of others to oneself shape one’s self-representations (Yeung & Martin, 2003). Being positively regarded by teachers should then lead to positive self-representations and higher SE in students. It is not surprising that Martin et al. (2007) have found a positive relation between high quality STR and SE in high school students. They have further suggested that STR has an even stronger influence on SE than child-parent relationships. Even though this relationship is empirically established in a sample of high school students, these effects may be similar or even stronger among elementary school students.

Some might argue that the direction of this relationship is from SE to STR, such that high SE students might have greater interpersonal skills and take more social initiative. However, Baumeister et al. (2003) argue that the support for this argument is sparse and that even though high SE students report greater interpersonal skills, peer ratings have not shown any effect of SE on interpersonal skills. Instead, Baumeister et al. (2003) argue, in line with
sociometer theory, that SE is more of an outcome of social popularity and acceptance. It is therefore hypothesized that STR will predict SE in the present study.

Relative age effect on academic achievement

There is multiple evidence for a RAE on AA. This effect has been found in Icelandic fourth graders (Zoëga, Valdimarsdóttir, & Hernández-Díaz, 2012), Chilean eighth graders (Navarro, García-Rubio, & Olivares, 2015), Norwegian tenth graders (Lien, Tambs, Oppedal, Heyerdahl, & Bjertness, 2005), British seventh to tenth graders (Bell & Daniels, 1990), Belgian first graders (Verachtert, De Fraine, Onghena, & Ghesquière, 2010), and American fifth graders (Martin, Foels, Clanton, & Moon, 2004). However, there is a trend of a diminishing effect as students grow older (Bell & Daniels, 1990; Zoëga et al., 2012). Therefore, the youngest sample in the Korean Youth Panel Survey (KYPS), fourth graders, has been chosen for the present study.

In addition to the effect on AA, a RAE has also been found in other aspects of education. For example, relatively older children attain higher degrees than relatively younger children (IFAU, 2006). Similarly, students who are born earlier relative to their classmates are more likely to be participants in programs for gifted children and students born later relative to their classmates are more likely to be held back a year (Thompson et al. 2004). Relatively younger children have also been found to have lower school attendance (Cobley, McKenna, Baker, & Wattie, 2009) and greater likelihood of being diagnosed with ADHD (Holland & Sayal, 2018) as well as learning disabilities (Diamond, 1983). All these findings further highlight the negative impact of being among the youngest in the classroom and that the RAE in the academic setting is not isolated to AA. In accordance with the findings of prior literature, it is hypothesized that RAE will predict AA.

Academic achievement and self-esteem

There are plenty of reasons to believe that there is a close relationship between AA and SE. Tafarodi and Swann (2001) have shown that SE is a two-dimensional concept. One of the dimensions is self-competence. They argue that self-competence is based on observable abilities, skills, and talents (Tafarodi & Swann, 2001). As AA can be seen as a measure of certain skills and talents as well, it is likely that AA will have a positive relationship with self-competence and SE. In addition, multiple studies have found there to be a positive relationships between AA and SE in both elementary school and high school students (Rosenberg, Schooler, & Schoenbach, 1989; Yang, Tian, Huebner, & Zhu, 2018). Baumeister, Campbell, Krueger, and Vohs (2003) argue that the direction of these relationships is likely from AA to SE since programs aiming to boost SE in students do not lead to higher academic performance. In line with this previous literature, it is then hypothesized that AA will predict SE among children.

Socioeconomic status
Family SES has been shown to affect SE in childhood. Twenge and Campbell (2002) conducted a meta analysis that found a positive relation between SES and SE. They argue that the magnitude of SES effect on SE may be relatively smaller during childhood than later in life (Twenge & Campbell, 2002). Yet, Fenzel (1992) still argues that SES is important to control for when studying RAE in academic settings since parents of high SES is more likely to be able to support children who are struggling at school and thereby compensating for the child’s RA. If SES is not controlled for, then the effect of other factors, such as RAE, could be obscured by the effect of family SES on SE. Thus, the present study will control for family SES to examine unique contributions of aforementioned factors.

The present study

The present study will use longitudinal data from a nationally representative Korean sample of fourth to fifth graders to explore the mediating effects of STR and AA on the relationship between RAE and SE. This longitudinal design will make it possible to infer a causal relationship from STR or AA to SE. This will be the first study of the RAE on SE to use nationally representative data and the first one studying the RAE on SE in South Korea. As low SE has been related to multiple negative outcomes (see Trzesniewski et al., 2006), the results from this study may be used as backgrounds for interventions aiming to improve children’s SE and prevent negative development trajectories. Thus this study may make a unique and important contribution to the research field.

The present study hypothesizes the following: (1) RAE will predict STR which in turn will predict SE, (2) RAE will predict AA which in turn will predict SE, and (3) RAE will be directly associated with SE in children, as visualized in figure 1. Research have shown that behaviors related to age have been associated with STR of different quality. Behaviors more prevalent in older students, such as effortful control, are related to higher quality STR while other behaviors that are more prevalent in younger students, such as externalizing problem behaviors, are related to lower quality STR (e.g., Rudasill, 2011). Therefore, a RAE on STR was suggested. Evidence has been found for an association between STR and SE (Martin et al., 2007) and it has been argued that the direction is from STR to SE (Baumeister et al., 2003). Therefore, it was suggested that STR predicts SE. All this lends support to the first hypothesis. Multiple studies have shown a RAE on AA (e.g., Zoëga et al., 2012) and a likely causal link from AA to SE (Baumeister et al., 2003) supporting our second hypothesis. In support of the third hypothesis, there is empirical evidence for a RAE on SE (Fenzel 1992; Thompson et al., 2004). Previous studies have also shown that SES is important to control for when studying RAE in academic settings (e.g., Fenzel, 1992). To control for SES, the present study will use a comprehensive operationalization of SES consisting of the father’s education level, the mother’s educational level, and household income. Even though there are evidence for each of these hypothesized links from previous literature, no previous study has explored these links in a single analysis.

Fig. 1. Hypothesized model.
Method

Participants

The participants consist of 2,844 ($M$ age = 9.86, $SD = 0.35$; 53.6% male at baseline) students from the KYPS, a longitudinal study conducted between 2004 and 2008 by the National Youth Policy Institute (NYPI) and supported by the South Korean government. A stratified multistage cluster sample design was used to make the sample nationally representative for South Korea, excluding Jeju island. In the first wave, schools were selected based on geographical location and in each school a fourth grade class was randomly selected for participation in the survey. The present study will use data from the first and second waves. In the second wave, 2,707 (95.2%) participants remained in the sample.

In the first wave, the mean monthly household income was 3,021,400 won (equivalent to $2,693 in 2019, SD = 1,765,200) in 2004. Parents’ highest completed education was: no schooling (0.04% for fathers and 0.07% for mothers), elementary school (1.58% for fathers and 1.66% for mothers), middle school (4.09% for fathers and 5.11% for mothers), high school (43.29% for fathers and 60.99% for mothers), junior college (9.61% for fathers and 7.59% for mothers), college or university (35% for fathers and 23.1% for mothers), master’s degree (4.8% for fathers and 1% for mothers), and Ph. D. degree (1.6% for fathers and 0.4% for mothers).

Instruments
All measures have been constructed by the researchers at the NYPI. The measures have been constructed in both Korean and English. The participants in the present study answered the measures in Korean.

**Self-esteem.** Students’ SE was assessed using six self-measure items concerning competence, self-worth, and character (e.g., “I think that I am a worthy person,” “I think that I have a good character,” and “I generally feel that I am a failure in life”). The answers were based on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Three items were negatively formulated and therefore reversed before all six items were summed and averaged. Higher values indicate higher SE. Cronbach’s alpha was .76.

**Student-teacher relationships.** Students assessed their STR with three items: “I can talk about all my troubles and worries to my teachers without reservation,” “teachers treat me with love and affection,” and “I hope to become a person just like my teacher”. The answers were given on a five-point Likert scale (1 = very untrue, 5 = very true). All three items was summed and averaged. Higher values indicate higher quality STR. Cronbach’s alpha was .55.

**Academic achievement.** AA was measured through students’ self evaluations of school grades from last semester in nine different subjects (Korean, English, math, social studies, sciences, music, arts, physical education, and ethics). The answers were rated on a five-point Likert scale (1 = very poor, 5 = very good). All nine items were summed and averaged. Higher values indicate higher AA. Cronbach’s alpha was .76.

**Relative age.** Each possible month of birth was given a specific value (e.g., December 1995 = 1, October 1994 = 15). Higher values indicate older students (range 1-36).

**Socioeconomic status.** SES was measured by the educational level of fathers (1 = no schooling, 8 = Ph. D. degree), educational level of mothers (1 = no schooling, 8 = Ph. D. degree) and monthly household income.

**Procedure**

The first wave of KYPS was conducted between November 15 and December 31, 2004. Trained interviewers visited the schools and held individual interviews as well as administered self measurement scales. Telephone interviews were held with the parents who answered general sociodemographic questions. A gift was given for participation. The second wave of KYPS was conducted between October 20 and December 20, 2005. Individual interviews were held with the participating students and self measurement scales were administered. A gift was given to the participants for participating the second year as well.

**Plan of analysis**

First, the internal consistency of SE, STR, and AA will be calculated with Cronbach’s alpha using SPSS 24. Second, descriptive statistics including means, standard deviations, and bivariate correlations between study variables will be examined, using SPSS 24 as well. Third, structural equation modeling will be run using AMOS 18.0 to test the hypothesized model in figure 1. Fourth and lastly, Sobel’s z tests will be conducted to examine whether
STR and AA serve as mediating factors in the RAE on SE. To evaluate model fit, the comparative fit indices (CFI), the $\chi^2$ statistic, the incremental fit index (IFI) will be used. According to Kline (1998) and Hoyle (1995), a CFI above .90 and an IFI above .90 are considered an acceptable model fit. To handle missing data in the model, the full-information maximum likelihood (FIML) estimator will be used.

**Ethical considerations**

This study will be conducted with the data from the first and the second wave of the Korea Youth Panel Survey (KYPS). The participants’ parents have agreed for their children to be included in the survey after being given a brochure including information about the survey and the children assented to participate in the study as well. Both schools and homeroom teachers were given the possibility to refuse participation in the survey. The participants are anonymous in the data.

**Results**

Means and standard deviations are shown in table 1. Table 2 describes the bivariate correlations between variables. RA was positively correlated with AA, STR, and SE. AA was positively correlated with STR, SE, and the family SES measures. STR was positively correlated with SE and the family SES measures. Finally, SE was positively correlated with the family SES measures. All correlations were in the expected direction.
Table 1

Descriptive statistics for study variables.

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<td>Relative age</td>
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<td>Student-teacher relations</td>
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<td>Academic achievement</td>
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<td>0.57</td>
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<td>Self Esteem</td>
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<td>Mother education</td>
<td>4.50</td>
<td>1.02</td>
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<td>Father education</td>
<td>4.93</td>
<td>1.19</td>
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<tr>
<td>Household income</td>
<td>302.14</td>
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*Note:* Household income is displayed in thousand Won.

Table 2

Correlations among study variables.

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*Note:* RA = relative age; STR = student-teacher relationships; AA = academic achievement; SE = self-esteem. N ranges from 2,640 to 2,844.

*p < 0.05, **p < 0.01 ***p < 0.001
The original model fit was poor, $\chi^2(12, N = 2,488) = 399.76, p < 0.001, \text{CFI} = .87, \text{IFI} = .86$. After adding a correlation between the error terms of AA and STR, the fit of the model became acceptable, $\chi^2(11, N = 2,488) = 242.20, p < 0.001, \text{CFI} = .92, \text{IFI} = .92$. The model shows that higher RA is predictive of higher quality STR and higher AA. Results indicate that both higher quality STR and higher AA are predictive of higher SE. The model also shows that higher family SES is correlated with higher SE. All paths were significant except the one from RA to SE (see Fig. 2).

To test whether STR and AA served as mediating factors in the RAE on SE, Sobel tests (one-tailed) were conducted. Both the indirect effects of AA ($z = 4.02, p < 0.001$) and STR ($z = 1.9, p = 0.03$) were significant. Since the direct path from RA to SE is nonsignificant, AA and STR fully mediated the effect of RA on SE.

Discussion

Low SE in children have been linked to a variety of negative outcomes throughout the lifespan (Trzesniewski et al., 2006). Previous studies have found that low RA, being younger than one’s peers in the classroom, is a risk factor for developing low SE (Fenzel, 1992; Thompson et al., 2004). However, no previous study has examined any mediating factors of this effect. One of the aims of the present study was to examine if STR and AA are such mediating factors, since they both have been linked to RA as well as SE. It was hypothesized that there would be a RAE on SE and that STR and AA would serve as mediating factors.

The current study found a relatively weak RAE on SE. This weakness makes sense from a theoretical perspective since SE is a complex phenomenon and stems from a wide range of sources, limiting the explanatory power of RA. The effect size found in this study was smaller than in the previous research conducted in the US (Fenzel, 1992; Thompson et al., 2004). One possible explanation might be that different mediating factors do exist in the US than in South Korea. In South Korean culture, education is highly valued (Kim & Park, 2006) and therefore how well a student performs in school might be more strongly associated with the student’s SE than in the US. This suggests that the importance of school for the RAE on SE in South Korea is further supported by the current study where factors in the academic setting fully explained the RAE on SE. In the US, factors outside the academic setting (e.g., sports) might have a stronger effect on student’s SE.

The present study was the first one to establish an empirical link between RA and STR. This link is in line with previous studies showing that children’s effortful control abilities improve and externalizing problem behaviors decline with age (Miner & Clarke-Stewart, 2008; Simonds, 2007), which are significantly associated with a high quality of the STR (Lei et al., 2016; Rudasill, 2011). Given this, it can be argued that teachers may prefer students who are chronologically older and thus more mature than their peers. Given the lack of research on this topic, future studies should continue to examine how students’ RA is linked to STR.

In line with Martin et al.’s (2007) reports, a positive link between STR and SE among students was found. While previous research has established this relationship only in high school students (see Martin et al., 2007), the present study found this association in fourth graders. This finding adds to the body of knowledge in this area and it seems that the positive
association between STR and SE may persist throughout school age. That is, the age of the students does not seem to matter for the relationship between STR and SE. Because of its longitudinal design, the present study could establish that STR in grade four can predict students’ SE in grade five. This is in line with the notion of Baumeister et al. (2003) that SE is an outcome of interpersonal success, rather than the other way around.

The current study found that AA is dependent on RA. There is substantial evidence for a RA on AA from previous research. The effect has been found in different geographical areas, ages, and means of operationalization (i.e. GPA or achievement tests) (e.g., Navarro, 2015; Zoëga et al., 2012). This study is however the first one to establish this relationship in South Korean fourth graders, confirming previous studies showing RAE on AA.

In line with previous research (Rosenberg et al., 1989; Yang et al., 2018), high AA was found to be associated with higher SE. The importance of AA for SE is unsurprising to find in a South Korean context. In South Korea, students rank AA as the most important achievement and attribute AA to self-regulation skills, such as effort and discipline, rather than innate and uncontrollable traits, such as ability and personality (Kim & Park, 2006). Thus, young students might attribute their lower AA to faults of their own, rather than a consequence of being less mature than their peers, which in turn takes a toll on their SE.

Both STR and AA was found to be mediating factors in the RAE on SE. The oldest students in the classroom are both more likely to form high quality relationships with their teachers and more likely to perform well in school, which in turn improve their SE. Together, these two factors fully mediate the RAE on SE, meaning that the RAE on SE can be fully explained by the RAE on STR or AA. STR and AA at fourth grade were also found to be related to each other, meaning that students who perform well in school are more likely to form high quality STR and vice versa.

It was shown that SE was affected by family SES. This is in line with previous studies documenting that family SES has a significant effect on children’s SE (Twenge & Campbell, 2002). This result is also consistent with Fenzel’s (1992) reasoning that families with higher SES would have greater means of supporting children in their learning, which might contribute to SE in children. The present findings lend credence to the hypothesis and make a potentially significant contribution to the literature, given that RAE is still indirectly associated with SE through STR or AA even after controlling for the effect of family SES.

The results of the present study are in line with existing theories of SE. According to the looking-glass-self theory, it is through social interactions that we form our conceptions of ourselves (Yeung & Martin, 2003). It is then likely that students gain SE through STR by internalizing positive interactions with their teachers and that teachers’ positive attitudes towards the student then turn into self-liking, one of the two dimensions of SE proposed by Tafaroudi and Swann (2001). Since older students have more positive interactions with their teachers they are more likely to internalize self-liking and thereby gaining SE. In school, the high value of AA is communicated by teachers. Therefore, according to the looking-glass self theory, students internalize this valuation of AA and those who manage to perform well in school will thereby improve their SE (Tafaroudi & Swann, 2001).

The results of the present study are in line with sociometer theory as well. Recurrent positive interactions and positive relationships, such as STR, can be seen as indicators of social value, which SE is a measure of according to sociometer theory (Leary & Baumeister,
It is likely that high AA lead to appraisal by peers and teachers which would inform the students that they are of high social value (Leary & Baumeister, 2000). As older children are more likely to have higher AA and STR, it makes sense that the older children have higher SE. Given this theoretical background, it is unsurprising to find the academic setting to have such impact on childrens’ SE.

Limitations

The data set used for this study has many advantages. It has a large sample size, it is nationally representative, and it is longitudinal. It is in many ways an impressive and valuable data set, but the means of data collection has some weaknesses. All data were collected by self-report, including the grades that made up the AA measure in the present study. Self-report is not an objective kind of instrument and therefore susceptible to biases (Donaldson & Grant-Vallone, 2002). For example, it is possible that participants with lower SE reported lower grades than they had achieved. Self-report may be a limited instrument for measuring STR as well. Having students evaluate the relationships between themselves and their teachers might only reflect the students’ perception of the relationship. Teacher or observer measures may tell a different story. Using actual grades or having teachers evaluate the student’s grades and the STR, instead of relying upon participants’ own self-reports, would have made the data more reliable and even more impressive than in its present state.

The measures used for the present study were deemed good enough. They all had acceptable internal consistency except for STR, which had a Cronbach’s alpha of .55. In other words, the items used for each construct were likely to measure different aspects of the same thing. Unfortunately it does not say anything about validity, whether these constructs measure what they are expected to measure. Our measure of STR consisted of only three items, and even if these items measured the same thing, it is possible that the measure do not capture the entirety of the construct. Adding questions about for example conflict between the student and the teacher might have made the scale more comprehensive. SE on the other hand consisted of six items, which may be better. Yet, it is still not a standardized measure of SE, meaning that it is not certain that it really measures SE. It is possible that the results would have been different and more accurate, if standardized measures with better psychometric properties had been used in the study. It may also have improved the fit of the model used in the present study. Unfortunately, one limitation of using a pre-existing data set is that the quality of the data collected is out of the researcher’s control.

The present findings are not necessarily generalizable to other populations. In the present study a sample of fourth to fifth graders are being studied. It is presumable that SE have different causes, consequences, and correlates in different stages of a person’s life. Previous literature has shown that the RAE on AA diminishes with age (e.g., Zoëga et al., 2012). Therefore, if the RAE on SE is still present in older age groups, it is likely that other factors are more important.

Further research
Further research should first and foremost address the limitations of this study. Well-standardized measures are needed to improve both validity and reliability. To increase the generalizability of the results, one could examine different geographical populations and different age groups. But to expand the scope of research is not necessarily desirable depending on what is being studied. Even though generalizability is often to be strived for, some phenomenon is limited to certain areas or groups of people. It is possible that the RAE on SE is more accentuated in certain groups of children such as children with various disabilities. It may then be more interesting to examine if there are such groups and limit the research to those children.

The present study was conducted on school children, but it is unlikely that mediating factors for the RAE on SE can be found exclusively in the school environment. Even though STR and AA were found to be mediating factors between RAE and SE in children, there may be other mediating factors as well. Such factors could be for example other types of relationships, abilities, or social skills. Further studies should then examine if different mediating factors for the RAE on SE can be found in other environments than school setting.

**Implications**

The results of the present study can be used in a variety of applications. For example, it can be used to predict low SE in order to prevent negative development in children. The present study has identified three underlying factors of SE: RA, STR and AA. One way to improve children’s SE, and thereby preventing negative development, might then be to create programs that focus on how teachers can form higher quality relationships with their students and how to improve their AA. The RA of the students however, can obviously not be influenced by teachers. On the individual level, teachers and other school personnel should identify and pay attention to those students who are struggling academically and having trouble in their relationships with their teachers, as they are likely to develop low SE. These students may benefit from additional educational support and deliberate positive attention from teachers. Interventions that address these issues could prevent a lot of unnecessary suffering.

The results of this study can also be of guidance when deciding what sorting method should be used in order to form classes. One conceivable way to sort classes would be by half year instead of full year basis. As age would vary less, STR and AA would also vary less, and thereby lessen the strain on the youngest students in the classroom. However, forming classes on half year basis could possibly lead to new challenges, especially for smaller schools where classes would become too small to be economically feasible. Further research and debate is needed in order to settle on a sorting method that is both economically sustainable and advantageous for the development of children’s SE.

**Conclusion**

Low SE has been shown to have devastating consequences throughout the lifespan, making research about the development of SE in children important. Previous research has also shown that being younger than most classmates has a negative impact on SE. The present
study aimed to find the factors underlying this relationship, using a national representative sample of South Korean fourth graders. Based on the literature, it was hypothesized that STR and AA would act as mediating factors in the relationship between RAE and AA among children. The results of the present study support these hypothesis'. Children who are relatively older than their classmates form higher quality relationships to their teachers and perform better in school which in turn increases their SE. In view of these findings, intervention programs aiming to boost children’s SE should focus on improving their academic performance and relationships with their teachers. It was also argued that sorting classes on a half year basis might level the playing field and reduce the effect of RA on SE. However, this study is not without its limitations. The measures used was not standardized and based on self report. In order to verify the findings of the present study, further research should address these limitations. Further research should also investigate the RAE on SE in other countries to establish cross-cultural validity.
Reference list


