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Hovedoppgave i Profesjonsstudiet i psykologi  
Veileder: Lars Wichstrøm  
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Norges teknisk-naturvitenskapelige universitet  
Fakultet for samfunns- og utdanningsvitenskap  
Institutt for psykologi



Kunnskap for en bedre verden



## Forord

Utgangspunktet for denne oppgaven var et ønske om å bidra til kunnskap om noe som angår alle barn og ungdom, da vi begge er særlig interessert i utviklingspsykologi, men også normalpsykologi. Vi valgte derfor å se på sammenhengen mellom barn og unges sosiale ferdigheter og selvbilde. Vi var så heldige å få bruke longitudinelle data fra Tidlig Trygg i Trondheim-prosjektet, noe som har gjort at vi faktisk kan si noe om utvikling. I arbeidet med å sette seg inn i den omfattende litteraturen som eksisterer om begge disse fenomenene, har det vært uvurderlig å være to om jobben. Til å begynne med fordelte vi arbeidet slik at Vilde leste om sosiale ferdigheter mens Frida leste om selvbilde. Vi forstod derimot etterhvert at vi burde sette oss inn i begge temaene for å kunne skrive en helhetlig og god oppgave, og har siden det jobbet tett sammen. Introduksjonen og diskusjonen er derfor et resultat av samarbeid og bidrag fra begge to. Videre har Vilde skrevet metoddelen, mens Frida har tatt seg av det som har med analysemetodene å gjøre (“analytic strategy” i metoddelen) og resultatdelen.

Måleinstrumentene brukt til datainnsamling i Tidlig Trygg i Trondheim-prosjektet er beskyttet av copyright. Måleinstrumentene brukt i denne oppgaven er derfor ikke vedlagt som appendiks.

Vi ønsker å rette en stor takk til alle som har deltatt i Tidlig Trygg i Trondheim-prosjektet, og som gjennom sin deltakelse bidrar til viktig kunnskap om barn og ungdoms utvikling. Vi vil også takke alle ansatte ved NTNU som jobber på prosjektet. En spesiell takk ønsker vi å rette til vår veileder, Lars Wichstrøm, som har vært en viktig støtte for oss gjennom hele dette prosjektet. Hans faglige kunnskap og lange erfaring både innenfor klinisk arbeid og særlig innenfor forskning har vært uvurderlig. De gangene vi har funnet oss fordypet langt ned i faglitteraturen, har Lars fått oss til å løfte blikket og finne tilbake til fokuset i oppgaven. Vi setter stor pris på hjelpen vi har fått med analysen av dataene og tolkningen av disse. Lars har vært tilgjengelig og gitt grundige tilbakemeldinger gjennom hele prosessen, noe som har gjort at vi har lært mye.

Frida Marie Engeset og Vilde Dyvik Vasseljen

Trondheim, 15. desember, 2023

### **Abstract**

Self-esteem and social skills are important for children and adolescents' well-being and functioning. The two phenomena are assumed to influence each other based on existing theories and results from previous studies but have never been studied together using longitudinal data. The present study aimed to investigate the reciprocal relationship between self-esteem and social skills using longitudinal data from the Trondheim Early Secure Study (TESS). Participants were children born in 2003 and 2004 with parents residing in Trondheim, Norway (N = 1007; 50,9% girls). Measurements took place over seven waves with biennial assessments (mean ages: 4.7, 6.72, 8.8, 10.51, 12.49, 14.35 and 16.98 years). We investigated the associations between self-esteem and social skills at the within-person level using the random intercept cross-lagged panel model (RI-CLPM). We also analyzed the data with the commonly used cross-lagged panel model (CLPM), which does not separate between-person effects from within-person effects, to compare the results from the two models. The results from the CLPM showed a significant cross-lagged effect in both directions. The results from the RI-CLPM revealed a small effect supporting our hypothesis that increased self-esteem predict increased social skills. Conversely, no evidence was found to support our hypothesis that increased social skills would predict heightened self-esteem, and thus no reciprocal relation between the two measures was revealed. No age- or gender differences were found. These results indicate that efforts to improve self-esteem in children and adolescents might also improve their social skills.

## Sammendrag

Selvfølelse og sosiale ferdigheter er viktig for barn og ungdoms trivsel og fungering. Basert på resultater fra korrelasjonsstudier har man antatt at de to fenomenene påvirker hverandre, men de har aldri blitt studert sammen ved bruk av longitudinelle data. Den aktuelle studien hadde som mål å undersøke det gjensidige forholdet mellom selvfølelse og sosiale ferdigheter ved hjelp av longitudinelle data fra Tidlig Trygg i Trondheim-studien (TTiT). Deltakerne var barn født i 2003 og 2004 med foreldre bosatt i Trondheim, Norge (N = 1007; 50,9% jenter). Målinger ble gjennomført på åtte tidspunkt (gjennomsnittsalder: 4,7, 6,72, 8,8, 10,51, 12,49, 14,35 og 16,98 år). Vi undersøkte sammenhengene mellom selvfølelse og sosiale ferdigheter på innen-personnivå ved hjelp av random intercept cross-lagged panel model (RI-CLPM). Vi analyserte også dataene med en cross-lagged panel model (CLPM), som ikke skiller mellom effekter på mellom-personnivå og innen-personnivå, for å sammenligne resultatene fra de to modellene. Resultatene fra CLPM viste en signifikant “cross-lagged” effekt begge retninger. Resultatene fra RI-CLPM avdekket en liten, signifikant effekt som støttet hypotesen vår om at økt selvfølelse forutsa økte sosiale ferdigheter. Det ble derimot ikke funnet støtte for hypotesen om at økte sosiale ferdigheter førte til økt selvfølelse, og dermed ble ingen gjensidig sammenheng mellom de to målene avdekket. Ingen alders- eller kjønnsforskjeller ble funnet. Resultatene indikerer at forsøk på å bedre selvfølelse hos barn og unge kan også bedre sosiale ferdigheter.

## **An Investigation of the Relationship Between Social Skills and Self-Esteem in Childhood and Adolescence**

Humans are considered a social species, and we are born with an innate need to belong (Buhrmester, 1990). We wish to form meaningful and close relationships with others, and to do so one is dependent on social skills. The development of such skills is contingent on an array of variables, both internal, like personality traits, but also external, like the parent-child relationship and upbringing conditions (Beauchamp & Anderson, 2010). Social skills improve with age (Buhrmester, 1990; Ross et al., 2019). It is known that social skills in childhood most likely have a meaningful impact on later well-being and development in different domains. Children with poor social skills are more likely to show higher levels of depressive symptoms, be rejected by their peers, have fewer friendships, and feel lonelier (Arnett, 2012; Greco & Morris, 2005; Nilsen et al., 2013). Children with good social skills are in general happier and show higher levels of self-esteem compared to children with poor social skills. Good self-esteem has, in the same way as social skills, been shown to forecast several beneficial outcomes, such as being better at problem-solving and having higher life satisfaction (Cole et al., 2005; Solomon & Serres, 1999). Low self-esteem has been linked to a higher prevalence of mental health issues, such as anxiety and depression, as well as maladjustment in school and in social relations (Cole et al., 2005; Mruk, 2006).

Thus, both good social skills and high self-esteem might promote children's psychosocial growth and adaptation and can be target points for interventions. Existing research indicates that there is a correlation between social skills and self-esteem (Koszalka-Silska et al., 2021; Sakiz et al., 2021; Shimizu et al., 2019). However, it is less clear how this correlation should be interpreted. Besides the possibility of them being overlapping phenomena and being caused by common factors, there is the possibility that each phenomenon contributes to the other. This is a heretofore unresearched possibility that we aim to shed light on in the present study. Researching how change in one of these phenomena might predict change in the other will potentially give rise to a wider understanding regarding the development and prospective association of social skills and self-esteem. This can further have important clinical implications relevant for developing interventions with the purpose of improving a child's psychosocial functioning and well-being.

### **Social Skills**



There exists a large number of definitions of social skills, and although they may differ somewhat in their wording, the majority of the definitions overlap and share many of the same elements. Social skills can be understood as learned behavior that makes an individual capable of positively interacting with other people in an accepted and appropriate manner based on the context and culture the person is a part of (American Psychological Association, 2023; Prette & Prette, 2021). Some of the most commonly identified social skills are assertiveness, coping, communication, interpersonal problem-solving, and the ability to regulate one's cognitions, emotions, and behavior (American Psychological Association, 2023). Social skills are not understood as congenital, although it is believed that humans are born with a fundamental capacity to form social relationships, and an ability to socially interact with other humans (Beauchamp & Anderson, 2010; Urnes & Urnes, 2020). The development and acquisition of social skills depends on the child's interactions and interplay with others. According to Bandura's Social Learning Theory (SLT), behavior can be learned through both direct experience and observation (Bandura, 1977). Regarding direct experience, social skills are learned through feedback the child receives as a consequence of their actions; positive outcomes of social actions reinforce behaviors, while negative outcomes can lead the child to adjust their actions. When observing others, the child notes the outcomes of actions, and the child uses these observations to create hypotheses about which actions and behaviors are appropriate in which settings. These hypotheses form mental representations of socially appropriate behavior and thus make up a framework for social skills (Bandura, 1977). This demonstrates that the child needs to observe, experience, and get told how and why to act in a certain way, to master positive social interactions. In the early years of life, social skill learning will happen mainly through parent-child interaction, but as the child gets older, other important people in the child's surroundings will play an increasingly important role, such as peers and teachers (Rubin et al., 2006).

The ability to establish friendships with peers does to a large degree depend on social skills. Children with good social skills have a larger number of friends and show a higher satisfaction with their friendships while having poor social skills predicts lower friendship quality (Crawford & Manassis, 2011; Shimizu et al., 2019). Popularity plays an increasingly important role in the social world in middle childhood (Holder & Coleman, 2008; Lease et al., 2002). Social skills are said to have the strongest influence on popularity, with children who are friendly, helpful, cooperative, considerate, and good at perspective-taking showing a higher likelihood of

being popular (Arnett, 2012). The opposite is true for children who lack good social skills, who often get in conflict with other children because of their lack of social understanding and difficulty in controlling their emotional reactions (Arnett, 2012). They can be perceived as more impulsive and annoying, and might also be perceived as disruptive by their peers. Other children with a lack of social skills can be shy and socially withdrawn (Kingery et al., 2010). Children with a lack of social skills will more often be rejected by their peers and, as a consequence, have fewer friends, feel lonelier, and may have difficulties improving and developing their social skills due to a lack of opportunities to do so. Peer rejection predicts psychosocial difficulties later in life, such as conduct problems in adolescence and emerging adulthood (Miller-Johnson et al., 2002).

An abundance of studies shows that poor social skills in childhood and adolescence predict central life outcomes in adulthood, such as internalizing and externalizing problems (Domitrovich et al., 2017; Huber et al., 2019; Jones et al., 2015; Segrin, 2000). Having good social skills in kindergarten has been linked to several important life outcomes, such as having a higher likelihood of completing college and having a stable job, and a lower likelihood of having been arrested (Jones et al., 2015). It has also been found that children with poor social skills show a higher vulnerability to being bullied (Cook et al., 2010). Because of the presented benefits of having good social skills, and the consequences of having poor social skills, we wanted to investigate whether self-esteem can predict the development of social skills throughout childhood and adolescence, as this could have clinical implications on how to improve children's and adolescents' social skills.

### **Self-Esteem**

Self-esteem can be defined as an individual's subjective evaluation of one's worth as a person (Orth & Robins, 2014). High self-esteem involves feelings of self-respect and self-acceptance. Based on this definition, a person's self-esteem is not necessarily a reflection of their objective abilities and talents (Donnellan et al., 2011; Orth & Robins, 2014). Self-esteem seems to be dual in nature, as researchers often distinguish between global self-esteem and domain-specific self-esteem. Global self-esteem is an overall estimate of our general self-worth composed of all subordinate traits and characteristics within the self (Guindon, 2010), while domain-specific self-esteem describes self-satisfaction in specific areas, such as appearance and academic skills (Gentile et al., 2009). In line with this, children's self-esteem is believed to be contingent

on self-concepts in multiple domains, such as social skills, sports ability, and behavioral competence (Harter, 1999). The various domains will have different and varying importance for different children, for example, with some having a global self-esteem more reliant on sports performances while others are more affected by their social feedback from friends (Harter, 2006; von Soest et al., 2016).

Higher levels of self-esteem are associated with initiative, spontaneity, openness, a secure identity, positive adjustment, and a general absence of psychopathology (Harter, 2006; Mruk, 2006). Higher levels of self-esteem during childhood have been linked to satisfaction and happiness later in life (Cole et al., 2005). Trzesniewski et al. (2006) found that adolescents with higher self-esteem levels had better mental and physical health, better economic prospects, and lower levels of criminal behavior in adulthood, compared to those who had lower self-esteem levels in adolescence.

Global self-esteem correlates negatively with feelings of shame and guilt, embarrassment, loneliness, neuroticism, and general negative affectivity (Mruk, 2006). Lower global self-esteem levels in adolescence have also been associated with an increased likelihood of suicidality in both adolescence and early adulthood, for both sexes (Harter, 2006; Soto-Sanz et al., 2019; Wild et al., 2004). A relation has also been found between low self-esteem and externalizing problems such as delinquency, aggression, and antisocial behavior (Donnellan et al., 2005; Harter, 2006; Wild et al., 2004). Having lower levels of self-esteem has also been associated with internalizing problems such as anxiety and depression (Keane & Loades, 2017). So, similar to the findings on social skills, having higher self-esteem levels during childhood and adolescence seems to be beneficial for the individual both in the present and in the prospective future. This indicates that self-esteem levels during adolescence can have long-lasting consequences, which underlines the importance of researching what might influence the development of self-esteem, which can give clinical implications on how to improve self-esteem.

### **Self-esteem and Social Skills – Theoretical Reflections and Empirical Findings**

Koszalka-Silska et al. (2021) found a moderate connection between social skills and self-esteem in adolescents, and Sakiz et al. (2021) found a connection between self-esteem, perceived social competence, loneliness, and being excluded. Children with higher satisfaction and quality in their friendships also show higher self-esteem levels (Shimizu et al., 2019), and as described earlier, friendship quality is linked to social skills (Crawford & Manassis, 2011; Shimizu et al.,

2019). These findings indicate that there is a connection between social skills and self-esteem, but in the mentioned studies data has only been collected at one time point, and thus they cannot say anything about the direction of influence.

### ***Social Skills Contributing to Self-Esteem***

Harter argued that the self should be understood as both a cognitive construct and a social construction crafted in the crucible of interactions with significant others (Harter, 1999). According to her view, self-esteem will thus necessarily be affected by socialization with parents and peers, two key influences (Harter, 2006). As has already been stated, this also applies to social skills, with the development and acquisition of social skills depending on the child's interactions and interplay with others. Thus, it seems evident that a mutual and crucial factor in the development of both self-esteem and social skills is socialization with others. Based on Susan Harter's understanding of self-esteem (Harter, 2006), which states that self-esteem is influenced by socialization, we can hypothesize that an increase in social skills will lead to an increase in self-esteem.

Charles Cooley used the expression "looking glass self" in his "Looking-Glass Self Hypothesis" (LGSH) from 1902 to describe how others, especially the ones you have a close relationship with, work as a "social mirror" (as cited in Silva & Calheiros, 2022). According to the LGSH, an individual's self-representation is influenced by how they think they are assessed by people who are important to them (Silva & Calheiros, 2022). Thus, LGSH is in line with our hypothesis that mastering social interactions, which requires good social skills, with people that are important to you, will have a positive effect on your self-esteem.

Feeling included and socially accepted is important for our self-esteem, and studies have found that self-esteem is connected to the need to belong (Gailliot & Baumeister, 2007). The need to belong refers to the strong and universal motive to develop lasting, positive, and significant relationships with others (Leary, 2022). However, studies have found that it is not enough to merely feel that you belong or are part of a social group (Leary, 2011). According to sociometer theory, it is the subjective feeling of acceptance and/or rejection from others that influences our self-esteem (Leary, 2011). A study found that those who received negative rejecting feedback from others showed lowered self-esteem levels compared to those who received positive and accepting feedback (Leary et al., 1998). Similarly, a Canadian study found that adolescents who perceived their friends as being supportive had higher self-esteem than

adolescents who perceived little or no support from their friends (Khanlou, 2004). Thus, according to sociometer theory, individuals are dependent on feeling accepted and included by others to develop and maintain high self-esteem levels, whereas feelings of exclusion and rejection lower self-esteem levels. Children with poor social skills have been found to have a higher likelihood of being rejected by their peers than those with good social skills (Arnett, 2012). We therefore hypothesize that improvements in a child's social skills can contribute to heightened self-esteem levels.

### ***Self-Esteem Contributing to Social Skills***

Low self-esteem is associated with caution, timidity, conflict avoidance, lack of initiative and spontaneity, and insecurity (Mruk, 2006). We can assume that a lack of social initiative (i.e., an indication of poor social skills) will be linked to fewer social interactions and, hence, fewer opportunities to learn and practice social skills. In line with this way of thinking, we hypothesize that children with higher levels of self-esteem, to a greater extent, dare to enter social interactions and thus get to practice and advance their social skills more than children with low self-esteem. This assumption is supported by the finding that children with higher self-esteem levels to a larger degree expect to be accepted by others (Gailliot & Baumeister, 2007), rely on themselves, persist longer when faced with difficult tasks, and see the world as more friendly, which probably makes it easier for them to initiate social interactions (Solomon & Serres, 1999). Thus, we assume that having lower levels of self-esteem might contribute to poorer social skills, and accordingly, we hypothesize that an increase in self-esteem will predict enhanced social skills.

Even though the idea that social skills and self-esteem are related is not novel within the field of psychology, it has not been subject to a systematic test. The presented findings and theories make it possible for us to create hypotheses about the potential relation between children's self-esteem and social skills. Taken together, existing research and theories have led us to create two hypotheses; (A) that an increase in social skills can predict heightened self-esteem levels, and (B) an increase in self-esteem levels can forecast improvement in social skills.

### **Age Differences in Social Skills' Influence on Self-Esteem**

Both self-esteem and social skills change with age; self-esteem becomes more complex (Harter, 2006), and social skills also expand (Kingery et al., 2020). Therefore, it is possible that their relative importance to each other also changes as the child ages. This possibility has not been investigated previously, a gap we aim to address in the present study. Understanding how

social skills and self-esteem influence each other at different ages might indicate a need for age-appropriate interventions and is therefore important to investigate.

### ***The Influence of Social Skills on Self-Esteem is the Biggest During Childhood***

Beginning in middle childhood, self-perceptions become more negative compared to the very positive self-perceptions seen in most young children (Marsh et al., 1998). In this regard, the emergence of three cognitive skills is noteworthy: (1) the ability to use social comparisons for the purpose of self-evaluation, (2) increases in social perspective-taking skills, and (3) the ability to differentiate real from ideal self-perceptions (Harter, 2006). In adolescence, further cognitive advances allow the individual to incorporate seemingly contradictory attributes about the self (for example “How can I be both depressed and cheerful?”), into meaningful abstractions about the self (for example “I am a moody person”). Children can create self-evaluations that differ across domains of experience as their cognitive abilities develop. The emerging cognitive abilities also permit the older child to distinguish between real and ideal self-concepts, and these can be compared to one another and potentially create discrepancies that have consequences for the self. During adolescence, newfound cognitive abilities allow for the creation of multiple selves in different relational contexts (Harter, 2006). So, as cognitive development progresses, the individual's capacity for self-reflection and self-evaluation becomes increasingly sophisticated. Consequently, global self-esteem comes to encompass a broader array of individual traits and qualities. This can lead us to assume that changes in one domain-specific self-esteem in adolescence, may not exert a big enough impact to have a significant influence on global self-esteem later on. However, during earlier stages of childhood, when a child's self-evaluation is more rudimentary and grounded in fewer specific attributes, evaluation of the self is likely to be more connected to day-to-day experiences (Harter, 2006). In such cases, factors like rejection or difficulties in mastering social skills may indeed have a more pronounced impact on a child's self-esteem. Thus, we might expect that social skills will have a greater influence on self-esteem during childhood than in adolescence.

### ***The Influence of Social Skills on Self-Esteem is the Biggest During Adolescence***

However, we know that adolescence is a time characterized by a dramatic increase in the amount of time spent with peers, at the same time as the family gets a less influential role in the adolescent's life (Buhrmester, 1990; Masten et al., 2012). The ability to establish close and intimate friendships has been shown to have increasing importance from about the age of 13 and

throughout adolescence (Buhrmester, 1990). As presented earlier, this ability is influenced by the child's social skills (Crawford & Manassis, 2011; Shimizu et al., 2019). During a typical week, high school students spend almost one-third of their waking hours with peers, which is more than double the time spent with parents and other adults (Rubin et al., 2006). As children and adolescents grow older, friendships become increasingly important, and with this in mind, it seems likely that social skills will have an enhanced influence on self-esteem with age. Contrary to the hypothesis stated in the previous paragraph, we can, based on the presented notions, hypothesize that social skills will have an increasing influence on the development of self-esteem during adolescence.

Existing theories and findings have led us to create two contradictory hypotheses about age differences in social skills' influence on self-esteem. The fact that we have been able to make these two hypotheses could also imply that both hypotheses may be correct and that social skills as a result may exert a fairly equal influence on self-esteem throughout childhood and adolescence, thus suggesting that we may not observe any age-related differences. Because of the lack of longitudinal studies on social skills and self-esteem, we do not have enough to rely on to be able to determine which hypothesis we believe is the most likely. This demonstrates a gap in the research, which underlines the importance of investigating this in our studies.

### **Age Differences in Self-Esteem's Influence on Social Skills**

From the literature we have reviewed on these topics we have not found any evidence to suggest that self-esteem is more or less important for social skills at different ages. Based on that, we could assume that self-esteem will have the same impact on social skills at different ages. However, we believe that the lack of relevant literature prevents us from drawing a hypothesis, as the absence of literature indicating an age difference does not necessarily imply the absence of it. We argue that it is important to investigate this in our study both because it can have important clinical implications and contribute to new knowledge in the field.

### **Gender Differences**

There appears to be a qualitative difference in girls' and boys' friendships in middle childhood and early adolescent years, where the friendships of girls are marked by greater intimacy, self-disclosure, validation, and caring, while boys' friendships are characterized by physical activities that do not require exchange of personal information (Rubin et al., 2006). In addition, girls' close friendships are more likely to occur one-on-one, while boys' friendships

more often occur in a larger social network, and hence their friendships have a less intimate character than girls' (Rubin et al., 2006). Since girls tend to have more intimate relationships with friends, it is conceivable that girls may be more reliant on more complex social skills to navigate friendships compared to boys. Consequently, we hypothesize that improvement of social skills could be deemed more crucial to girls' self-esteem than boys'. We have not found literature or research findings that suggest there is a gender difference in self-esteem's influence on social skills, but because of the scarcity of relevant research, we refrain from making a hypothesis about gender differences in this direction.

### **Within-Person Analysis**

We aimed to provide data that could facilitate predictions regarding the potential impact of social skills on self-esteem and *vice versa*. Several existing studies have examined self-esteem and social skills (Frankel & Myatt, 1996; Koszalka-Silaska et al., 2021; Sakiz et al., 2021), but in these studies, the data have been collected at only one time point and do not tell us anything about how these phenomena develop or affect one another. Due to the gap in research, and the importance of social skills and self-esteem, we argue that there is a need for studies that examine changes in the relationship between social skills and self-esteem over an extended period of time, using prospective data, in order to gain knowledge about the direction of influence. Therefore, we applied a prospective design.

Estimates from traditional methods, such as regression models and cross-lagged panel models, conflate within- and between-person information, which prevents the opportunity to draw causal implications (Halse et al., 2022). For this reason, we needed a method that allowed us to compare a person's level of social skills and self-esteem with their own level at a subsequent time point. Within-person analysis adjusts for the class of confounders that do not change their impact over the observational period, such as stable effects of parental socioeconomic status, parenting style, and the stable impact of genetics, and one is thus able to separate the within-person level from the between-person level (Hamaker et al., 2015). So, to achieve our goal of this study we chose to use a random-intercept cross-lagged panel model (RI-CLPM), which will be described in further detail in the paragraph regarding analytic strategy.

### **The Present Study**

Existing research has shown the effects of both social skills and self-esteem levels in childhood on central life outcomes later in life. But even though the two phenomena seem to



correlate, the nature of this relationship is still ambiguous since it has not yet been investigated in prospective studies. Based on the above reasoning, we propose two hypotheses: (A) increased self-esteem will predict increased social skills, and (B) increased social skills will predict increased self-esteem. It is also unknown whether these predictions are stronger or weaker at different ages, or if there are gender differences in predictions. We hypothesize that improvement of social skills could be deemed more crucial to girls' self-esteem than boys'. Apart from this, given the contradictory theorizing and evidence concerning age and gender effects, we will remain open to whether there are such effects as well as their strength and direction.

## **Methods**

### **Participants and Procedure**

The present findings are based on data collected in the Trondheim Early Secure Study (TESS), which was launched in 2007 (Steinsbekk & Wichstrom, 2018). At the time of launch, the participating children were 4 years of age. The participants have been re-tested biennially. The TESS study was approved by the Regional Committee for Health Research Ethics, Mid-Norway.

All children born in 2003 and 2004, with parents residing in Trondheim, were invited to participate in the study (n=3456). The invitation was sent by mail to the families' homes prior to the routine 4-year-old health checkup at the local health center. The families received a letter of invitation to the study by mail, which also included the Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 2000). The SDQ is a screening assessment for emotional and behavioral problems. The parents were asked to complete the SDQ and bring the completed form when they attended the checkup at the health center. At the scheduled appointment the parents received information from the health nurse according to procedures approved by the ethics committee, which obtained written consent for participation. Parents who showed inadequate proficiency in Norwegian to fill out the SDQ were excluded (n=176). Nurses failed to ask 166 parents for participation. A total of 3016 children with their families were asked to participate. Of these, 82,1% consented. The primary aim of the TESS study was to examine psychosocial development and mental health over time, and because of this, the researchers oversampled for emotional and behavioral problems to increase variability and thus statistical power (Steinsbekk & Wichstrom, 2018). Based on their SDQ scores, the children were assigned to four strata (cut-offs 0-4, 5-8, 9-11, 12-40). The likelihood of being included in the study increased with an increasing SDQ-score (0.37, 0.48, 0.70, 0.89 in the four strata, respectively). Based on this procedure a total of 1250

families were selected for participation, and at the first wave, there was obtained information from 1007 participants (T1;  $M_{age}=4.7$ ,  $SD=.3$ ; 50,9% girls). Children were subsequently assessed at ages 6 (T2;  $n=802$ ;  $M_{age}=6.72$ ,  $SD=.17$ ; 49,8% girls), 8 (T3;  $n=704$ ;  $M_{age}=8.8$ ,  $SD=.24$ ; 51,1% girls), 10 (T4;  $n=703$ ;  $M_{age}=10.51$ ,  $SD=.17$ ; 52,3% girls), 12 (T5;  $n=666$ ;  $M_{age}=12.49$ ,  $SD=.15$ ; 51,9% girls), 14 (T6;  $n=636$ ,  $M_{age}=14.35$ ,  $SD=.59$ ; 53,0% girls), and 16 (T7;  $n=665$ ,  $M_{age}=16.98$ ,  $SD=.31$ ; 55,1% girls). Using the Little's MCAR test we found no significant systematic attrition according to study variables ( $\chi^2=4034.03$ ,  $df=3890$ ,  $p=.053$ ). It is worth noting that the p-value is only slightly larger than 0.05, indicating a need for caution when interpreting these results. We therefore examined attrition in a pairwise fashion by logistic regression in SPSS. Lower rates of self-esteem at age 12 predicted attrition at age 14 (OR = 1.71, 95% CI = 1.02, 2.87;  $p=.042$ ). The same was found for the attrition from age 14 to age 16, lower self-esteem at age 14 predicted attrition at age 16 (OR = 1.49, 95% CI = 1.01, 2.20;  $p=.046$ ). Children who were considered by their parents to have lower social skills at age 6, had a higher likelihood of drop-out by age 8 (OR = 2.75, 95% CI = 1.25, 6.02;  $p=.012$ ). The same was found from age 12 to 14 (OR = 3.47, 95% CI = 1.58, 7.62;  $p=.002$ ). These results indicate that our group of participants consists of children with somewhat higher levels of self-esteem and social skills than the general population.

## Measures

### *Self-Esteem*

Self-esteem was measured using the Self-Description Questionnaire (SDQ-I) at ages 6, 8 and 10 (T2  $\alpha=.82$ ; T3  $\alpha=.84$ ; T4  $\alpha=.87$ ) (Marsh et al., 1984). At ages 12, 14, and 16 the children's self-esteem was assessed using the Self-Perception Profile for Adolescents (SPPA-R) (T5  $\alpha=.77$ ; T6  $\alpha=.84$ ; T7  $\alpha=.86$ ) (Harter, 1988; Wichstrom, 1995). The shift in instrumentation was due to the need for more developmentally appropriate measurement.

SDQ-I is a questionnaire based on self-report, which aims to measure an individual's self-concept (Marsh, 1990). SDQ-I is appropriate for primary school students and consists of 76 items, rated on a 5-point Likert scale "False" (1) to "True" (5). In the present investigation, we used the General Self-concept scale. A sample item is "In general, I like being the way I am". Some of the items are negatively worded, and these have been re-coded so that a higher score on SDQ-I implies better self-esteem. SDQ-I has proven good internal consistency (Kaminski et al., 2005; Marsh & Holmes, 1990).

SPPA-R is a self-report questionnaire, which measures both domain-specific and global self-esteem. SPPA-R consists of 45 items, rated along a 4-point scale, ranging from “Describes me very well” to “Describes me very poorly” (Harter, 2012). A sample item is: “I am very hard to like”. The respondents evaluate their self-esteem by responding to the 45 items, representing eight specific domains, in addition to a separate global self-worth subscale. In our study, we used the global self-worth subscale to measure the respondents’ self-esteem. The global self-worth subscale consists of 5 items. SPPA-R has shown good validity (Wichstrom, 1995).

### ***Social Skills***

Social skills were measured by collecting information from the children's parents, using the Social Skills Rating Scale (SSRS) at ages 4, 6, 8, and 10 (T1  $\alpha = .89$ ; T2  $\alpha = .91$ ; T3  $\alpha = .93$ ; T4  $\alpha = .92$ ) (Gresham et al., 1990). Information was obtained from one parent only, the parent who came to the testing with the child. The parent version of the SSRS consists of 46 items and measures the parent’s responses along the four dimensions “cooperation”, “assertiveness”, “self-control” and “responsibility”. The parents respond to the items along a 4-point frequency scale, ranging from “Never” (0) to “Very often” (3). The four dimensions represent socially competent behaviors, which facilitate social interaction in different social settings. To measure social skills we used an overall measure, made up of the four dimensions in the SSRS. The SSRS has shown good psychometric properties (Gresham et al., 2011). The Social Skills Improvement System (SSiS), which is a further development of the SSRS, was used at ages 12, 14 and 16 (T5  $\alpha = .96$ ; T6  $\alpha = .96$ ; T7  $\alpha = .91$ ) (Gresham & Elliott, 2008). As with the original SSRS, SSiS has also proven to have good psychometric properties (Gresham et al., 2011).

### **Analytic Strategy**

#### ***Random Intercept Cross-Lagged Panel Model***

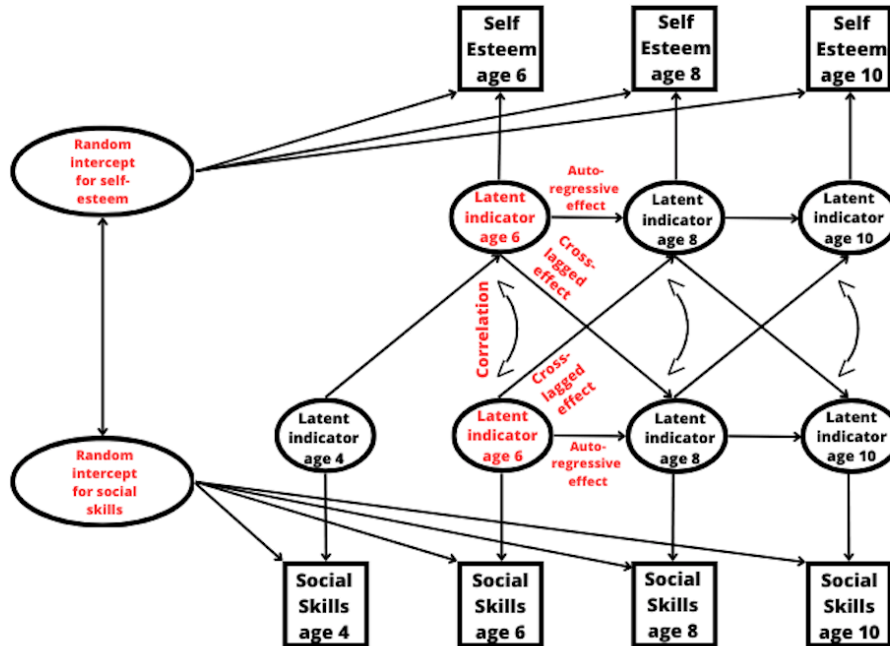
To examine whether a change in self-esteem predicted a change in social skills, and *vice versa*, a within-person level, we applied a random intercept cross-lagged panel model (RI-CLPM). The RI-CLPM was proposed by Hamaker et al. (2015) and is an extension of the traditional cross-lagged panel model (CLPM) (Mulder & Hamaker, 2021). Hamaker et al. (2015) argued that by only accounting for temporal stability through the inclusion of autoregressive parameters, the CLPM implicitly assumes that all people vary around the same means and that there are no trait-like individual differences that endure. Hamaker et al. (2015) pointed this out as a problematic assumption as it is difficult to imagine a psychological construct that is not, to

some extent, characterized by stable individual differences. Therefore, they argue that the within-person level needs to be separated from the between-person level. As a result, they developed the RI-CLPM, which accounts for both temporal stability and time-invariant, trait-like stability of including a random intercept (Hamaker et al., 2015). The random intercepts capture a unit's time-invariant deviation from the temporal group means and thus represent the stable differences between the units (Mulder & Hamaker, 2021).

In our study, we created two *random intercepts*, each loading on the respective constructs at all time points with the factor loadings set to 1. In this way, the random intercepts partial out between-person variance so that the lagged relationships in the RI-CLPM pertain to within-person dynamics (Hamaker et al., 2015). At each time point a *latent indicator* was created for each observed variable with the factor loadings set to 1 and the variance in the observed variable set to 0 (Hamaker et al., 2015). Thus, the variance was transferred to the corresponding latent indicator, while the two random intercepts consisted of the stable parts of the variables across all time points (Joshi, 2022). The *cross-lagged effects* were of most interest to us when applying the RI-CLPM, as they indicate the extent to which the two variables predict each other on the within-person level. More precisely, the cross-lagged parameter indicates the extent to which the change in one variable ( $y$ ) can be predicted from the individual's prior deviation from their expected score on the other variable ( $x$ ), while controlling for the structural change in  $y$ , and the prior deviation from one's expected score on  $y$  (Hamaker et al., 2015). A significant cross-lagged effect indicates that a score above (or below) the individual's mean in one variable predicts a score that is above (or below) the individual's mean in the other variable at the next time point. The cross-lagged effects in the RI-CLPM thus capture the cross-situation spill-over effect from one variable to the other over time and are pure within-person effects obtained after partialling out the stable parts of the variables (Joshi, 2022). The *autoregressive parameters* in the RI-CLPM represent the amount of within-person carry-over effect from one occasion to the next on the same variable (Hamaker et al., 2015). A significant autoregressive effect in the RI-CLPM indicates that when an individual's score is above (or below) their average score on a variable, we can expect that they will score above (or below) their average on that variable at the next time point as well (Joshi, 2022). *Correlations* between variables at the same time point, indicate the extent to which a deviation in self-esteem is correlated with deviations in social skills at that time point (Joshi, 2022). Figure 1 below illustrates the mentioned parts of the RI-CLPM.

**Figure 1**

*An Illustrative Figure of the Random Intercept Cross-Lagged Panel Model (RI-CLPM)*



*Note.* This figure demonstrates RI-CLPM where the mentioned parts of the model are highlighted in red. The squares in the model are the observed variables. As the purpose of this figure was to illustrate the mentioned parts of the model, we did not include all the time points that were used in our study.

### ***Cross-Lagged Panel Model***

We also applied a CLPM to compare the results from an RI-CLPM to those from a CLPM, as CLPM is a frequently used method when analyzing longitudinal data, despite its mentioned weaknesses (Hamaker et al., 2015; Usami et al., 2019). The main difference between the CLPM and the RI-CLPM is that the CLPM does not separate the between-person level from the within-person level. The cross-lagged parameter in the CLPM represents a simple partial regression coefficient from the predictor to the outcome variable, after controlling for the effect of the outcome variable at the previous time point (Usami et al., 2019). The stability of the constructs in the CLPM is controlled for through the inclusion of autoregressive relationships

(Hamaker et al., 2015). Smaller autoregressive coefficients indicate more variance in the constructs, meaning less influence or stability from the previous time point. While larger autoregressive coefficients indicate little variance over time, and hence more stability from the previous time point (Kearney, 2017). But if the stability of the constructs is to some extent of a time-invariant, trait-like nature, the inclusion of autoregressive parameters will fail to adequately control for this. The estimates of the cross-lagged regression coefficients will be biased and may thus lead to incorrect conclusions regarding the underlying causal pattern (Hamaker et al., 2015).

### **Estimation and Model Fit Evaluation**

All analyses were performed in Mplus 8.5 (Muthén & Muthén, 2017), applying a robust maximum likelihood estimator that does not presuppose multivariate normality. Because of the screen stratification, all analyses were performed using probability weights corresponding to the number of children in the population in a specific stratum, divided by the number of participating children in the stratum, to arrive at corrected population estimates. Attrition was handled according to a full information maximum procedure. To determine the model fit we used the Model Chi-Square ( $\chi^2$ ) along with its degrees of freedom and associated p-value, the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and its associated confidence interval. The acceptable threshold levels were low  $\chi^2$  relative to degrees of freedom with an insignificant p-value ( $p > 0.05$ ) (Hooper et al., 2007), CFI and TLI with values greater than 0.95 (Hooper et al., 2007), and RMSEA with values less than 0.07 (Steiger, 2007). We used the procedure described by Bryant & Satorra (2012) to compare the fit of the different models, to discover which model best fits the data. To test whether the cross-lagged effects were different at different ages, we compared a model where these cross-lagged paths were freely estimated with a model where paths were fixed to be identical across time. We did so until the most parsimonious model was obtained. To test whether the cross-lagged effects differed between boys and girls we compared the RI-CLPM model with the best fit (where boys' and girls' paths were set to be identical), to a RI-CLPM model where the boys' and girls' cross-lagged paths could differ from each other.

## **Results**

### **Descriptive Statistics and Correlations**

The means, standard deviations, and correlations among all study variables are presented in Table 2 in the Appendix. There were high positive correlations between Social skills measured

at all the different time points. There were moderate to high positive correlations between Self-esteem measured at most of the different time points, except for Self-esteem at age 6 with Self-esteem at ages 14 and 16, where there were no significant correlations, and between age 8 and 16, where there was only a small correlation. Furthermore, for the most part, Self-esteem at a specific age correlated with Social skills at other time points. Notable exceptions were found between Self-esteem at age 16 and Social skills between age 4 to 14, where there were no significant correlations.

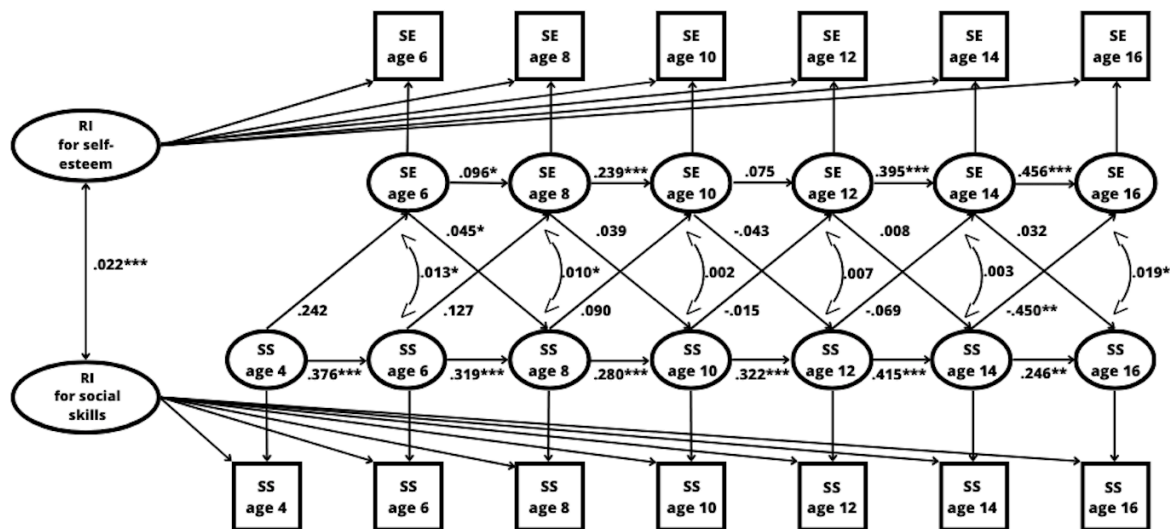
### RI-CLPM

We tested several models to find the most parsimonious model. In Model 1 the paths between Self-esteem and Social skills were allowed to vary over time. Model 1 fitted the data well ( $\chi^2 = 77.54$ ,  $df = 45$ ,  $p = .002$ , CFI = .986, TLI = .976, RMSEA = .027, 90% CI [.016, .037]). Model 1 is presented in Figure 2 below. In Model 2 the paths between Self-esteem and Social skills were fixed to be equal over time. Model 2 fitted the data well, but proved to have a poorer fit to the data compared to Model 1 ( $\chi^2 = 97.62$ ,  $df = 54$ ,  $p < .001$ , CFI = .981, TLI = .973, RMSEA = .028, 90% CI [.019, .037],  $\Delta\chi^2 = 20.05$ ,  $\Delta df = 9$ ,  $p = .018$ ). In Model 3, all paths were set to be equal, except the path from Social skills at age 14 to Self-esteem at age 16, which was allowed to vary, as this path clearly deviated from the others. Model 3 fitted the data well and proved to have as good a fit to the data as Model 1 ( $\chi^2 = 84.98$ ,  $df = 53$ ,  $p = .004$ , CFI = .986, TLI = .980, RMSEA = .025, 90% CI [.014, .034],  $\Delta\chi^2 = 7.68$ ,  $\Delta df = 8$ ,  $p = .465$ ). A more restricted model is preferred over a less restricted one, as a more restricted model has greater statistical power. Therefore, Model 3 was favored and is presented in Figure 3.

The results of the RI-CLPM showed that there was a small significant cross-lagged effect from Self-esteem to Social skills ( $B = .030$ ,  $p = .023$ ), indicating that a score above the individual's mean on Self-esteem predicted a score above that individual's mean on Social skills at the next time point. A significant effect was not found in the opposite direction ( $B = .095$ ,  $p = .098$ ), except between Social skills at age 14 and Self-esteem at age 16, where there was a moderate negative cross-lagged effect ( $B = -.405$ ,  $p = .003$ ), which indicated that a score above the individuals mean on Social skills at age 14 predicts a score below that individual's mean on Self-esteem at age 16. Standardized values varied from 0.06 to 0.07 on Self-esteem to Social skills, and from 0.04 to 0.06 on Social skills to Self-esteem from age 4 to 12.

**Figure 2**

*The Random Intercept Cross-Lagged Panel Model Examining the Relation Between Self-Esteem and Social Skills*



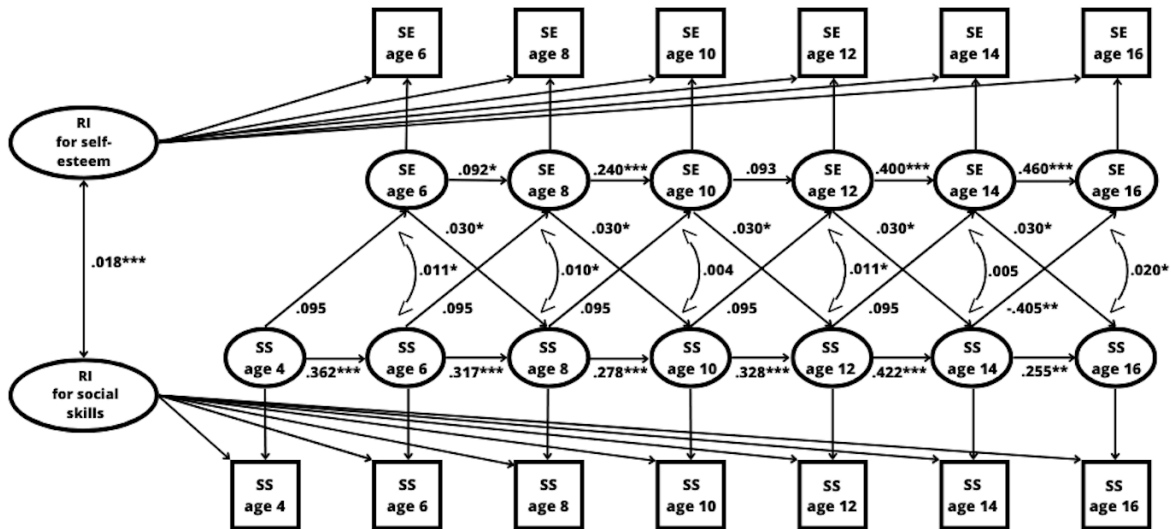
*Note.* In this model all paths were allowed to vary freely. This figure demonstrates that the path from SS age 14 to SE age 16 clearly deviated from the other paths. RI - random intercept. SE - Self-esteem. SS - Social skills. The RIs are on the between-person level, and the SE and SS in the circles are on the within-person level. Unstandardized coefficients.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Figure 3**

*The Random Intercept Cross-Lagged Panel Model Examining the Relation Between Self-Esteem and Social Skills*



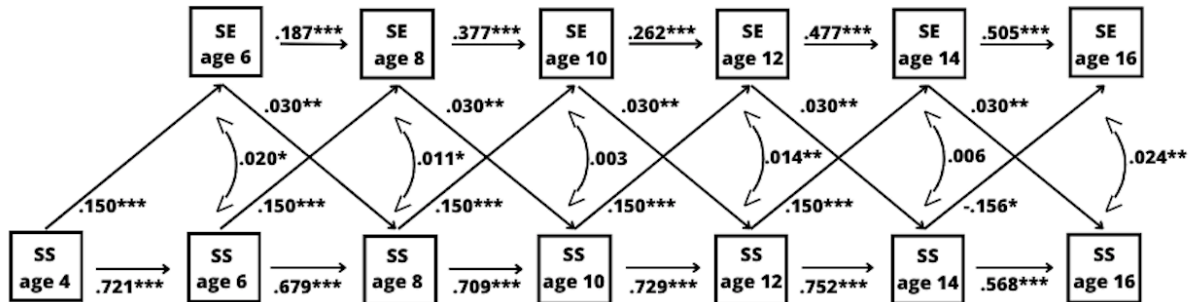
*Note.* In this model all paths were set to be equal except SS age 14 to SE age 16.

### CLPM

We also developed a CLPM because we wanted to compare the results from a CLPM to a RI-CLPM. We tested three models to find the best fit. As in the RI-CLPM, the paths between Self-esteem at one time point to the next, Social skills at one time point to the next, and the paths between Self-esteem and Social skills at the same time points, were allowed to vary in all models. In Model 1 the paths between Self-esteem and Social skills were allowed to vary over time. Model 1 did not fit the data well ( $\chi^2 = 235.31$ ,  $df = 50$ ,  $p < .001$ , CFI = .916, TLI = .869, RMSEA = .069, 90% CI[.060, .078]). In Model 2 the paths between Self-esteem and Social skills were fixed to be equal over time. This was not a good fit for the data and proved to be a poorer fit than Model 1 ( $\chi^2 = 266.37$ ,  $df = 59$ ,  $p < .001$ , CFI = .906, TLI = .876, RMSEA = .067, 90% CI[.059, .076],  $\Delta\chi^2 = 29.60$ ,  $\Delta df = 9$ ,  $p = .001$ ). Lastly, in Model 3 all paths were set to be equal, except the path from Social skills at age 14 to Self-esteem at age 16, which was allowed to vary. Model 3 did not fit the data well either, but had a better fit than Model 1 ( $\chi^2 = 252.23$ ,  $df = 58$ ,  $p < .001$ , CFI = .912, TLI = .882, RMSEA = .066, 90% CI[.057, .074],  $\Delta\chi^2 = 14.28$ ,  $\Delta df = 8$ ,  $p = .075$ ). CLPM Model 3 is presented in Figure 4.

**Figure 4**

*The Standard Cross-Lagged Panel Model Examining the Relation Between Self-Esteem (SE) and Social Skills (SS)*



The results of the CLPM showed that there was a moderate significant cross-lagged effect from Self-esteem to Social skills ( $B = .030, p = .002$ ), and a strong significant cross-lagged effect from Social skills to Self-esteem ( $B = .150, p < .001$ ). This indicates that a score above (or below) the group mean on Self-esteem predicts a score above (or below) the group mean on Social skills at the next time point, and *vice versa*. A small significant effect was found from Social skills at age 14 to Self-esteem at age 16 ( $B = -.156, p = .039$ ), indicating that an increase in Social skills at age 14 compared to the group mean predicts a score below the group mean on Self-esteem at age 16. Standardized values varied from 0.04 to 0.05 on Self-esteem to Social skills, and from 0.07 to 0.11 on Social skills to Self-esteem from age 4 to 12.

### Gender-Specific Analysis

To test whether there were any gender differences in the cross-lagged paths in the RI-CLPM, we compared a model where the paths for both boys and girls followed RI-CLPM Model 3, but where girls' and boys' cross-lagged paths could differ with a model where they were set to be identical. The results of the model comparison showed that the gender difference was insignificant  $\Delta\chi^2 = 0.46, \Delta df = 2, p = .793$ .

### Discussion

Self-esteem and social skills seem to have effects on subjective well-being and psychosocial functioning, as well as several important life outcomes in children and adolescents, such as internalizing and externalizing problems, like educational attainment and friendship quality (Arnett, 2012; Greco & Morris, 2005; Jones et al., 2015; Nilsen et al., 2013). Previous

research has documented a correlation between self-esteem and social skills in children and adolescents (Sakiz et al., 2021; Shimizu et al., 2019). However, it is unknown whether these two phenomena predict each other over time, and therefore we investigated this.

We hypothesized that increased self-esteem would predict increased social skills and that increased social skills would predict increased self-esteem. We also examined potential age- and gender differences in these effects. Our results provided support for increased Self-esteem predicting increased Social skills, whereas no support for the opposite order of predictions was obtained. No age- or gender differences were found.

### **Self-Esteem Predicted Social Skills**

We found a small but significant cross-lagged effect from Self-esteem to Social skills, even when the previous level of changes in Social skills and all time-invariant confounding effects were adjusted for. This might indicate that an increase in Self-esteem contributed to a small increase in Social skills at the next time point. This study was not designed to uncover why this is the case, but we will attempt to provide some possible explanations that future research can explore.

### ***Social Self-Efficacy***

Social self-efficacy can be understood as one's belief in oneself in social situations and relates to an individual's belief and confidence in him- or herself being able to behave in a manner that conveys a desirable impression to others (Di Giunta et al., 2010). Having lower levels of self-esteem is associated with being more cautious, lacking initiative, and being more insecure (Mruk, 2006). One can assume that such qualities will inhibit an individual from participating in social interactions and will make such situations challenging. Having lower levels of self-esteem might make an individual doubt one's social abilities, generating poor social self-efficacy and consequently poorer social skills. Social self-efficacy has been found to be a strong, general protective factor against symptoms of social anxiety (Aune et al., 2021). Since social anxiety symptoms are known to impair one's social functioning (Schneier et al., 1994), which can also be understood as an impairment of social skills, this supports our assumption that social self-efficacy works to support and protect one's social skills. Another study found an interaction between self-esteem and social self-efficacy which indicated that together, these two phenomena function as a protective factor against peer victimization's effect on academic achievement (Raskauskas et al., 2015). The study found that those children with higher levels of social self-

efficacy reported less peer victimization and lower levels of depression, as well as higher academic performance. Such findings indicate that social self-efficacy might function as a moderator between self-esteem and social skills. This should be a topic for future studies.

### ***Self-Esteem as a Top-Down Process***

Whether the development and influence of self-esteem best can be understood as a top-down or bottom-up process has long been discussed. Supporters of the bottom-up model claim that domain-specific self-esteem develops first and that this in turn lays the groundwork for the later development of global self-esteem (Harter, 2003). Supporters of the top-down model, on the other hand, believe that global self-esteem develops first, and then influences the child's self-perception in the various domains (Brown, 2014). Several studies have found support for the top-down model (Brown, 2014; Brown et al., 2001; Rentzsch & Schröder-Abé, 2022). According to these findings, one's global self-esteem influences one's various self-evaluations in the different domains, to protect and maintain one's feeling of self-worth (Brown et al., 2001). Further, it is claimed that global self-esteem functions as a guide to how people evaluate their specific qualities. Thus, people who generally like themselves will appraise themselves with many positive qualities (Brown et al., 2001). Based on this top-down understanding of self-esteem, a possible explanation for our finding is that increased global Self-esteem contributes to an increase in domain-specific social self-esteem, which in turn might then contribute to an increase in Social skills. Unfortunately, we have not found studies investigating the potential association between social self-esteem and social skills. Such a study could have contributed by either strengthening or weakening our assumed explanation. However, even though there has been found support for the top-down model, other studies have found support for both top-down and bottom-up effects, suggesting a reciprocal relationship between global and domain-specific self-esteem (Dapp et al., 2023). This suggests that much is still unknown regarding the source of the development of self-esteem.

Rosenberg et al. (1995) stressed the importance of distinguishing between global and domain-specific self-esteem as two different phenomena that are neither equivalent nor interchangeable. They found that academic self-esteem affected school performance, but global self-esteem did not. They also hypothesized that the effect of global self-esteem on behavioral outcomes is mediated by its effect on domain-specific self-esteem. It is worth noting that most of the studies that have investigated self-esteem have studied global self-esteem, not the different

domain-specific self-esteem (Dapp et al., 2023). This might have given a somewhat skewed impression of the importance of global self-esteem versus domain-specific self-esteem. In our study, we did find that global self-esteem had a small effect on social skills, but it would be interesting to swap out global self-esteem with domain-specific social self-esteem to see if this would result in a bigger effect. This could have clinical implications as to whether one should focus on improving global self-esteem or domain-specific social self-esteem to most effectively improve social skills. However, we were not able to do this because the TESS study did not include social self-esteem before age 12.

### **Social Skills Did Not Predict Self-Esteem**

Contrary to our expectation, a significant effect was not found from Social skills to Self-esteem. Socialization, feeling included and accepted, and perceiving to have a supportive friend group have been linked to having higher self-esteem (Gailliot & Baumeister, 2007; Harter, 2006; Khanlou, 2004; Leary et al., 1998). Since social skills are defined as learned behavior that makes an individual capable of positively interacting with other people in an accepted and appropriate manner (American Psychological Association, 2023; Prette & Prette, 2021), we hypothesized that improved social skills would have a positive influence on the ability to socialize, and on one's social environment, and thus contribute to higher self-esteem. The fact that Social skills turned out not to predict Self-esteem might then be explained by Social skills not being a mediating factor between socialization/social environment and Self-esteem.

Global self-esteem is composed of many subordinate traits within the self (i.e. domain-specific self-esteem) (Guindon, 2010). There are individual differences in how much the various components of the self influence global self-esteem, and which parts are most important to the self can also change throughout development (Harter, 2006; von Soest et al., 2016). Research has shown that there are several coping strategies that people use to protect their self-esteem, both through choice of comparison groups and by devaluating or ignoring problematic areas of one's own functioning or character (Rosenberg et al., 1995). So, another possible explanation for this finding is that those who feel socially inadequate may end up redefining the importance of social skills to their self-esteem to better tolerate themselves, and rather place greater emphasis on areas they master. As a result, their self-esteem is not affected by changes in their social skills. A third possible explanation of our finding is that social skills are not of importance to global self-esteem after all.

## **Age**

No age differences in predictions were detected, except that increased Social skills at age 14 predicted a decrease in Self-esteem at age 16; an unexpected counterintuitive finding. We have not found theories or previous findings that can explain this result. Given that we have performed numerous analyses on the dataset there is a risk that some of the observed associations may have occurred by chance (type 1 error). This is a common concern in data analysis and is referred to as the problem of multiple comparisons (Barnett et al., 2022). Therefore, this finding should be replicated before one can speculate on possible explanations behind this effect. The absence of significant age differences in the effect of Self-esteem on Social skills in our findings implies that Self-esteem played a role in the development of Social skills at all the ages we investigated (age 6 to 16). This suggests that efforts to enhance a child or adolescent's self-esteem may have a positive effect on their social skills, regardless of age.

## **Gender**

We found no significant gender differences in the effect between Social skills and Self-esteem. Even though we speculated that girls' self-esteem might be more reliant on social skills than boys, based on the gender differences in friendship content (Rubin et al., 2006), and thus thought social skills might have a bigger importance to girls' than boys' self-esteem, our current research findings did not support this notion. Our findings indicate that global self-esteem levels are of equal importance for boys' and girls' social skills. Interestingly, several studies have found gender differences in the importance of domain-specific self-esteem between girls and boys. Boys tend to have higher scores in the domains of physical appearance and athletic competence, whereas girls tend to score higher on self-esteem levels related to intimate relationships (Donnellan et al., 2007; Gentile et al., 2009; Young & Mroczek, 2003). While we observed no gender differences in the influence of global self-esteem on social skills, this does not necessarily imply an absence of gender differences in the extent to which various domain-specific self-esteems affect social skills. Since it has been found that different domain-specific self-images have different significance for boys and girls (Donnellan et al., 2007; Gentile et al., 2009; Young & Mroczek, 2003), it would be useful to investigate if there are gender differences in the impact of various domain-specific self-esteem on social skills. This should be done in future studies.

## **RI-CLPM versus CLPM**

We developed a CLPM because we wanted to compare the results from an RI-CLPM to those from a CLPM, as CLPM is a frequently used method when analyzing longitudinal data, despite its weaknesses (Hamaker et al., 2015; Usami et al., 2019). The CLPM indicated a moderately significant cross-lagged effect from Self-esteem to Social skills and a strong significant cross-lagged effect in the opposite direction, while the RI-CLPM did not indicate an effect from Social skills to Self-esteem and only a small significant cross-lagged effect from Self-esteem to Social skills. This shows that the within-person process and the between-person pattern of results are distinct, which has also been found in other studies comparing results from a CLPM to a RI-CLPM (Hamaker et al., 2015; Keijsers, 2016; Oerlemans et al., 2018). The model fit of the RI-CLPM was good, while the CLPM did not fit the data well. This comparison demonstrates that if we had only used the CLPM to analyze our data we would have reached another conclusion about the cross-lagged effect between Social skills and Self-esteem, a conclusion that would arguably be less correct based on the shortcomings of the CLPM (Hamaker et al., 2015), described in Analytic strategy when we were seeking to describe within-person change. Masselink et al. (2018) argued that the theoretical reasons to use within-person analyses together with the superior model fit of the RI-CLPM compared with the CLPM, advocate the use of the RI-CLPM, and our finding supports this notion.

### **Clinical Implications**

The research findings from our study showed a significant but small effect of global self-esteem on social skills. Even though the effect is small, our findings may have clinical implications. Interventions directed toward improving social skills are large in numbers and are generally proven effective (Gresham, 2016; McVey et al., 2016). Social skills can be taught and improved through directed exercises like modeling, coaching, and behavioral rehearsal. There also exist social skill interventions (e.g. S.S. GRIN) that integrate social skill training with work on the understanding of self and others, and improvement of self-esteem. These have shown promising results both on social skills and self-esteem, as well as reduced anxiety and depression (DeRosier & Marcus, 2005; Harrell et al., 2009). Our finding in the current study indicates that children and adolescents' social skills can be slightly improved by enhanced self-esteem, which supports the further development and use of social skill interventions that integrate work on self-esteem.

### **Strengths and Limitations**

The present study offers several strengths such as the use of a strong and conservative statistical method to disentangle within- and between-person effects, long-term follow-up with repeated measures (biennially from age 4 to age 16) of a large community sample, the use of well-validated instruments to measure self-esteem and social skills, and the use of different informants for self-esteem (self-report) and social skills (parent-report) to minimize the risk of common rater bias.

In the present study, there was a shift from the use of SDQ-I to SPPA-R for measuring Self-esteem, and from SSRS to SSiS for measuring Social skills. These shifts were due to the need for age-appropriate measures better suited for older children and adolescents. Our results showed that the interchangeability between these measures was satisfactory, and thus the shifts of measures do not need to be seen as limitations in this study. Not shifting to age-appropriate measures would arguably have been a greater weakness, as both self-esteem and social skills become more complex with age, and therefore more complex measures were needed from the age of 12.

As children get older, they spend less and less time with their parents, and more and more time with peers (Buhrmester, 1990; Masten et al., 2012), and adolescents (especially girls) both act and feel different when they are together with their mother, their father, and their peers (Harter, 2006). Taking this into account, one may question to what extent parents are capable of providing a representative assessment of their teenager's social skills. Thus, it can be considered a limitation that social skills are parent-reported, and one could speculate that friend-reported social skills would be more representative, especially in the teenage years (Harter, 2006). It is also a limitation that only one parent has reported social skills (Halse et al., 2022, see Table 1 in the Appendix), considering the presented notion that teenagers act differently with their mother and their father (Harter, 2006).

Although adjusting for time-invariant confounders, the RI-CLPM does not account for time-variant (unstable) within-person confounding effects (Kullberg et al., 2023; Mund et al., 2021), it simply assumes time-variant expected scores for each individual (Usami et al., 2019), which is a limitation. The relation between self-esteem and social skills may still be confounded by time-variant factors such as major life events like changes in family structure, changes in peer relationships, and transitioning from one educational level to another (elementary school to



middle school, and middle school to high school), to name a few. Such changes are not controlled for in the present study.

Lastly, the development of social skills differs across cultures, countries, and ethnic groups, as what is viewed as good social skills is culturally contingent (Edwards et al., 2006). Findings from various studies have indicated the importance of cultural context for the development of social skills, and it has also been indicated that subcultures related to religion, social class, and ethnicity within a society may influence the development of social skills (Chen & French, 2008). Regarding self-esteem, Wang & Ollendick (2001) suggested that it does not represent the same concepts across individualistic and collectivistic cultures, and Bleidorn et al. (2016) found cultural differences in the development of self-esteem. Of the participants in the present study, 92% were of Norwegian origin, and only 0.4% of mothers and 0.6% of fathers were from non-Western countries (Halse et al., 2022, see Table 1 in the Appendix). Hence there was a very low representation of ethnic minorities. For this reason, together with the presented findings that the development of social skills and self-esteem is culturally contingent we must stress that it is uncertain to what extent the results of the present study can be generalized to other cultures, countries, or ethnic groups, especially non-Western countries and cultures.

### **Conclusion**

The within-person results revealed a small predictive effect from increased self-esteem to later increased social skills, which was similar across ages and gender. No such effect was found in the opposite direction. Possibly, efforts to improve self-esteem in children and adolescents might also improve their social skills.

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**Table 1**

*Sample Characteristics and Descriptive Statistics of the Study Population at Child Age 6 (T2) (n=802), Cited from Halse et al. (2022)*

Category	Sample Characteristic	%
Gender of parent informant	Male	15.2
	Female	84.8
Ethnic origin of biological mother	Norwegian	92.3
	Western countries	7.3
	Other countries	0.4
Ethnic origin of biological father	Norwegian	92.3
	Western countries	4.4
	Other countries	0.6
Biological parents cohabitating status	Cohabitating	84.6
	Not cohabitating	15.4
Informant parent's occupational status	Leader	7.8
	Professional, higher level	26.3
	Professional, lower level	40.5
	Formally skilled worker	22.2
	Farmer/ fisherman	0.1
	Unskilled worker	3.0

**Table 2***Means, Standard Deviations, and Correlations for Study Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Self-esteem, age 6	-												
2. Self-esteem, age 8	.26***	-											
3. Self-esteem, age 10	.22***	.40***	-										
4. Self-esteem, age 12	.14**	.17***	.26***	-									
5. Self-esteem, age 14	.06	.20***	.21***	.41***	-								
6. Self-esteem, age 16	.06	.11*	.17**	.29***	.49***	-							
7. Social skills, age 4	.16***	.14**	.07	.05	-.01	.01	-						
8. Social skills, age 6	.20***	.16***	.11**	.13**	.08	.04	.62***	-					
9. Social skills, age 8	.20***	.20***	.16***	.16***	.06	-.02	.51***	.66***	-				
10. Social skills, age 10	.16***	.19***	.16***	.15***	.11**	.02	.51***	.63***	.70***	-			
11. Social skills, age 12	.11*	.11**	.08	.18***	.09*	-.02	.38***	.55***	.58***	.70***	-		
12. Social skills, age 14	.15**	.15***	.10*	.18***	.12**	-.04	.40***	.56***	.58***	.66***	.76***	-	
13. Social skills 16	.10*	.09	.08	.16***	.14**	.12**	.32***	.43***	.42***	.53***	.59***	.64***	-
<i>M</i>	3.51	3.57	3.55	3.55	3.24	3.05	2.67	2.84	2.91	3.00	3.31	3.29	3.22
<i>SD</i>	0.57	0.45	0.44	0.46	0.59	0.62	0.28	0.33	0.34	0.35	0.36	0.36	0.33

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

