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## Self perception of gifted girls in schools, exclusively for gifted children

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Universiteit Leiden

Psychologie  
Faculteit der Sociale Wetenschappen



Self-perception of gifted girls in schools, exclusively  
for gifted children

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Lightwave Project

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### Abstract

This study investigated self-perception of academic achievement and social acceptance of ten- to twelve-year-old gifted children who attend schools, exclusively for gifted children and compared their scores to those of either boys who attended the same schools or to boys and girls attending regular school-curricula. The “Competentiebelevingschaal voor Kinderen” (CBK), which is a version of the Harper's self-perception scale (1987), was used as item measurement instrument. No significant differences on self-perception of academic achievement were found between children, based on gender or school-type attendance. However, girls who attend schools, exclusively for gifted children, do score lower on self-perception of social acceptance than girls who attend a regular curriculum ( $d = .624, t(50) = 2.083, p = .042$ ). Children, attending schools, exclusively for gifted children, score lower on self-perception of social acceptance than children who attend regular schools ( $d = .666, t(110) = 2.416, p = .017$ ), yet this effect does not occur when exclusively comparing boys. This effect could possibly be explained through a combination of biological and social-contextual factors. Since girls reach puberty at an earlier stage than boys (Hayward, 2003) and since gifted children tend to experience some form of increased cognitive functioning, it is theorized that gifted girls experience the decline of positive self-perception, which is associated with early adolescence (Klein & Zehms, 1996; Lea-Wood & Clunies-Ross, 1995), more strongly at a younger age.

## Introduction

Self-perception is a very important developmental factor. Our perception of our capacities, physical body and intellectual potential has a big impact on our behavior now, and later in life. General self-perception changes throughout our lifetime, increasing until late adolescence and steadily increasing afterwards (Eccles, Wigfield, Flanagan, Miller, Reuman, & Yee, 1999). Since self-perception has a high predictability on general well-being (Karatzias, Chouliara, Power, & Swanson, 2016), mental health and academic achievement (Eisele, Zand, & Thomson, 2009), early adolescence is a critical period for healthy mental development in the future. By learning which groups of people are at risk for developing certain types of negative self-perception, we can learn about the factors that influence negative valenced self-perception and increase their chances of general well-being in the future. One group that has received relatively little attention with concerns to their self-perception is gifted girls in early adolescence. Because gifted girls are frequently underrepresented in gifted programs (Marsden, 2013) and are being recognized as gifted less often than boys, less data has been collected of this group in general. On top of that, gifted children show differences in self-perception than non-gifted children (Chan, 1988) and, because of neurological differences between boys and girls in early adolescence, it might be possible that these differences result in different self-perceptions for gifted boys and girls, as they do exist in non-gifted boys and girls (Skaalvik, & Johnsen, 1994). It is worthwhile to gain more insight on this topic, since there haven't been much publications about it thus far. Results can possibly contribute to more accurate life trajectories of gifted women and help assess risks for certain negative self-perceptions and thus psychopathology in later life. But first, a summarization of previous literature on relevant topics will be given.

### *Adolescence and the social brain*

Besides the physical changes that occur during puberty, neurological changes in specific areas of the brain cause differences in cognition and certain behaviors. A commonly accepted explanation for this is that structural brain development is necessary to help adolescents navigate an increasingly difficult social context and help maintain long

ing relationships. However, the process by which some neurological developments change certain behaviors seem to be centered around seeking out and avoiding certain stimuli. It does so by increasing or decreasing the number of neurotransmitters and hormones that are released in response to certain stimuli, either as a reward or punishment. As a result of this adolescent people perceive certain stimuli in a different manner than they did at a younger age. For example, certain behaviors elicit a stronger fear response than they did before (Stenson, Nugent, van Rooij, Minton, Compton, Richards & Jovanovic, 2021), while other stimuli may elicit more happiness than they did before (Blinn-Pike, Worthy, Jonkman, 2010). In order to receive these neurological rewards or avoid the punishment adolescents are forced to reshape certain aspects of their behavior through this process. Even though it is essential for the development of new social strategies, and thus also the transition from child- to adulthood, this principle also creates risks concerning the psychological well-being of young adolescents.

On one hand, the onset of adolescence brings in motion certain processes that stimulate certain behavior by increasing the search for neurological reward. Through increased growth in the nucleus accumbens, which functions as the body's natural reward system (Casey, Getz, & Galvan, 2008), adolescents tend to seek out new rewarding experiences (Kelley, Schochet, & Landry, 2004). As a result of this, they are willing to take more risk than any other age groups, either because they do not fully perceive the consequences of their actions as seriously as others or to improve their social credit among peers (Blinn-Pike, Worthy, Jonkman, 2010; Patton et al., 2016).

However, it seems like fear of punishment, rather than search for reward, shapes most of young adolescents' behavior. Conforming to social norms of peer groups seems to play an important role in the life of most young adolescents (O'Brien, & Bierman, 1988). Since resistance to peer pressure only starts to substantially increase from age 14 (Steinberg & Monahan, 2007), early adolescents are very susceptible to it. This can be explained by fear of social exclusion, which elicits a much stronger response in adolescents than any other age group (Sebastian et al. 2010). Because the limbic system, associated with emotional experiences, develops faster than the cortical regions, which is associated with rational thinking, adolescents have a skewed perspective of the impact of social exclusion. Casey, Getz and Galvin (2008) state that: "in emotionally salient situations, the limbic system will win over control systems given its maturity relative to the prefrontal control system." This indicates that it is more difficult for adolescents to rationalize social events than it is for people in



er age groups. In order to avoid the punishment of social rejection, adolescents are more willing to conform to peer pressure than others and therefore shape their behavior towards social norms among peers. Stanson et al., (2021) found that adolescents with a higher perceived pubertal status elicit much stronger responses to fear-inducing stimuli than adolescents with a lower perceived pubertal status. This implicates that, during puberty, adolescents are more susceptible to learning through fear.

Even though these social risks are largely based on how adolescents perceive the social world, they still have very real consequences. Bem postulated his “self-perception theory” around the idea that people tend to base various aspects their self-perception on what they think others think of them (1977). According to Bem, we see ourselves through the eyes of others, and need their acceptance in order to feel validated by ourselves. Although it is difficult to solidify the empirical basis of this theory, there are indications that self-perception in adolescents is largely based on how they think others perceive them. Pfeifer, Masten, Borofsky, Dapretto, Fuligni & Lieberman (2009) found that adolescent self-perception is associated with much more activity in brain regions that are linked to social cognition than in adults, postulating that intensive social interactions in this time-period are very important for their general self-perception. Connolly and Konarski (2004) found that peer-perception (along with friendship strength) strongly contributes to the self-concept of adolescents. On top of that, adolescence is a period that is also characterized by changes in social context. Most children make the transition from primary to secondary school, which requires them to re-establish their social identity among other peers. When they have problems concerning social adaptability at their new school, this often results in a negative influence on their social self-perception and general feeling of self-worth (Eccles & Midgley, 1990). All three of these studies are, to a certain degree in line with Bem's self-perception theory and so it seems that, at least during early adolescence, the way in which we see ourselves is in fact influenced by what others think of us.

To summarize: these neurological processes, that are at play in early adolescence, seem to indicate that children in this age group are biologically encouraged to engage in social interaction with each other. Often, they are placed in new social environments, in which they strongly feel the need to profile themselves and feel more rewarded when successfully carrying out new social strategies, just as they feel more punished when they feel like they are the odd one out. Through the process of creating, conforming to and questioning social norms, young adolescents build a social identity and compete for

place within the social hierarchy among peers. This process seems detrimental for childhood to develop into socially adjusted adults. However, this process does take its toll on the mental well-being of young adolescents.

Social adaptation is more difficult for some than it is for others, and can potentially cause long-lasting harm. Adolescents respond maladaptively to increased stress, associated with these developmental changes, by developing psychosocial adjustment problems. This is reflected by the fact that early adolescents have the lowest feeling of self-worth and least positive self-perception in comparison to any other age group (Eccles, Wigfield, Flanagan, Miller, Reuman & Yee, 1989), which contribute to their heightened vulnerability for the onset of internalizing psychopathology, such as depression and anxiety (McLaughlin & King, 2015). The degree of psychological distress, such as feelings of depression or anxiety, that people experience during early adolescence often is predictive for their degree of distress, at a later age (Stenson et al., 2011). These disorders often persist for multiple years and have a detrimental impact on academic and social development, as well as quality of life (Ingram, Scott, Hamill, 2009; Avgustinovich, Kovalenko & Kudryavtseva, 2005). Therefore, the biological and neuro-emotional changes that occur during early adolescence can have immediate but long-lasting consequences on mental health. Depressive disorders among young adolescents in the Netherlands have doubled between 2014 and 2018 and are still rising (CBS, 2020), which indicates that currently not enough is done to protect at-risk adolescents. In order to prevent problems that will occur at a later age, it is of the utmost importance to identify risk-factors for both adolescents in general and specific subgroups that are more at risk. Before adequate interventions can be developed, risk-groups and risk-factors must be identified. Only by developing a larger understanding of the social-biological framework that forms the foundation of adolescent self-perception are health-professionals enabled to adequately respond to the needs of adolescents in general and those of specific subgroups.

Social and biological risk-factors apply to all adolescents to some degree. However, groups that are unable to cope with social norms, such as adolescents with different sexualities, gender-identities or racial backgrounds (Bhugra & Ayonrinde, 2004) for example, show to have much higher chances to develop psychopathological ideas about themselves. Through discrepancies between certain aspects of their identity and their perception of social norms, specific maladaptive self-perceptions are formed. Since certain subgroups show different self-perception profiles, it is important to gather as much as possible information about them in order to protect their vulnerabilities.

*edness*

One group that has received a lot of attention from the scientific community regarding self-perception and social adaptability is gifted adolescents. There still is an ongoing discussion about what the exact criteria are for labeling a child as gifted and to what degree gifted adolescents are a risk-group for developing psychopathology. However, there seems to be a consensus regarding the existence of group-specific protective- (Muller, 2009) and risk factors for gifted children (Ross, 2006; Majid & Alias, 2010), indicating that adolescent children have different strengths and vulnerabilities in comparison non-gifted adolescents. This discrepancy can partially be explained through a term called “asynchronous development”, or also referred to as “asynchrony”. Asynchrony is defined as the large degree of heterogeneity in cognitive, socio-emotional and creative abilities in gifted children, caused by atypical growth speed in specific brain-areas (Silverman, 1997; Silverman, 2013). This explains how gifted children may have different needs and socialization strategies than non-gifted peers, though it must be stated that there still is much debate about how children become gifted and the accuracy of the giftedness identification process.

The biggest risk-factor for gifted children/adolescents, seems to be loneliness (Shechtman & Silektor, 2012). When gifted children don't receive adequate social or academic stimulation, they tend to feel the odd one out. Loneliness contributes to many developmental adversities in gifted adolescents. Gifted children often feel socially isolated when they can't discuss their interests with peers and are more willing to conceal their (academic) interests in order to fit in with their friends (Adams-Byers, Whitsell & Moon, 2004). This applies even more so for young adolescents, since the previously described neurological developments push adolescents towards conforming to the group identity. Since adolescents get more opportunities to connect their social identity with personal interests, they also get to practice less on various socialization skills (Shechtman & Silektor, 2012). Since gifted children have shown to have superior social adaptability (Hawes & Abbott, 2016) they know how to mask their differences for others quite well, but by doing so they risk losing interest in academic achievement. Even more importantly, even though others might not see gifted children as the odd one out, the gifted children often do feel that way (Shechtman & Silektor, 2012). They can feel like they have to change who they are and what they like in order to be liked by others. On top of that they are under stimulated in both

sonal and academic growth when not recognized for and supported in their growth-potential. How under stimulation and group conformity leads to adverse emotional and motivational outcomes was shown in a study by Gross (2006). She followed a group of highly gifted children for more than twelve years and found that gifted children who aren't granted educational acceleration, pose a greater risk of developing problems concerning long-lasting relationships and socialization in comparison to (highly) gifted children who did have educational acceleration.

When it comes to self-perception, there are also significant differences between gifted and non-gifted children. Competence experience, or perceived competence as it is also referred to, is the way a person sees his or her own competencies in specific areas, such as cognitive, social or physical. A study done by Chan (1988) showed that children with an average IQ of 130 or more tended to have higher competence experience when it comes to cognitive competence and general feelings of self-worth, but lower competence experience when it comes to social and physical competence. Although these findings are contradictory with other studies, stating that interpersonal competency experience is generally higher in gifted children (Lee, Olszewski-Kubilius, & Thomson, 2012), it is very well possible that the large degree of heterogeneity in gifted children, partially caused by asynchronous development, account for the existence of multiple self-perception profiles within this group.

The subgroup of gifted children where this is particularly the case is the subgroup of gifted adolescent girls. In a study done by Lea-Wood and Clunies-Ross (1995) self-esteem of gifted and non-gifted girls between ages 9 and 13 were compared. They found that both total self-esteem and social self-esteem of gifted girls were significantly lower. Also, they found that the self-esteem of gifted girls actually decreased more over time than that of non-gifted girls. This result is in line with other studies that found that the self-esteem and self-concept of gifted girls between age 8 and 12 decrease significantly (Klein & Zehms, 1996) and that in roughly the same period levels of hopelessness, perfectionism, and discouragement rise drastically in gifted girls (Kline & Short, 1991). All of these problems strongly resemble those of the problems that arise as a result of social non-conformity. Adolescent gifted girls might experience stronger feelings of shame concerning their giftedness because they tend to hide it from peers (Walker, Reis & Leonard, 1992), which supports the idea that group conformity is just as important in gifted early adolescents as it is in non-gifted adolescents. On top of that, it has been widely acknowledged that gifted girls have for a very long time been underrepresented in the gifted domain.

rmont, M., Stebbins & Holliday, 2001; Nelson & Smith, 2001) and are less likely to be referred to gifted programs (Bianco, Harris, Garrison-Wade & Leech, 2011). This makes gifted girls more likely to be placed in an environment that doesn't accommodate their needs for social and intellectual growth, but rather thwarts it. Since gifted girls, who aren't properly socially and educationally supported tend to feel like being the odd one out or lonely, they pose a greater risk for developing problems that are associated with social isolation, which is associated with long-lasting consequences for future academic development (Lea-Wood & Clunies-Ross, 1995) and both physical (Smith & Victor, 2019) and mental health (Mann, Lloyd-Evans, Ma, & Johnson, 2018).

However, even though gifted adolescent girls are more susceptible to having lower self-esteems than non-gifted girls, evidence has been found that they are diagnosed more frequently with depressive disorders than non-gifted adolescents (Shurt, 2002). Gifted girls, just like gifted boys, tend to elicit very adaptive cognitive flexibility and problem-solving abilities (Kitano & Lewis, 2005) even when frequently faced with adverse experiences. This enables them to cope with hardship better than non-gifted children might have done. Sadly, this does not mean that gifted girls are shielded completely from the negative consequences of social and academic under stimulation or feelings of loneliness. It seems very likely that, even though gifted children might seem less affected by (social) adversities, their advanced cognitive and emotional development (Robinson, 2008) enable them to interpret negative experiences more deeply and precisely than non-gifted children of the same age might have. Though gifted adolescents seem to be more resilient towards developing psychopathology in comparison to non-gifted adolescent (Francis, Hawes & Abbott, 2016), gifted girls face more difficulties in achieving academic success at a later age (Bianco, Harris, Garrison-Wade, & Leech, 2011) and enroll less frequently in programs for gifted children even if they are eligible (Crombie, Bouffard-Bouchard, & Schneider, 1992). On top of that, around 40% of gifted girls do not fulfill the academic aspirations they had during adolescence (Hollinger & Fleming, 1992). It seems therefore evident that the lower self-esteem and academic motivation in gifted girls are related to both more motivational problems in the present and later in life. The fact that women are still underrepresented in science globally (Hunt, Garant, Herman & Munroe, 2013; Beyers, 2014; Ceci & Williams, 2007) can partially be explained by these massive differences in academic motivation and self-perception between boys and girls. Women are not only being recognized for their extraordinary abilities less often but also having to pay the price for not fitting in

ause of it, gifted girls seem to be at risk, not for being unable to keep up with peers in the academic and social domain, rather for not being able to rise above them while they could have.

It seems like peer-support and group conformity play a central role in the development of academic and social self-perception of adolescent gifted girls. Within classrooms for gifted children, the social norms and group-members' perception of who does and doesn't fit within the group might actually be very different from that of a regular educational setting. This would affect the way in which peer-pressure influences self-perception and behavior in these groups. If they are surrounded by like-minded peers to whom gifted girls can relate, they will gain more confidence in terms of who they are.

This principle is also demonstrated in a study done by Stake and Nickens (2005). They put adolescent girls, who generally enjoy less peer support concerning aspirations to become scientists, through a program that stimulates the growth of peer-relationships. In a six-month follow-up Stake and Nickens found that the ideas of their possible future selves as scientists had drastically increased. Also, girls who participated in the program had more interactions with their co-participants and had stronger academic peer relationships than the boys, who participated in the program. This study reflects the importance of peer support among adolescents, especially girls, with ambitions or interests that deviate from societal and/or group norms.

This can also explain why Feldhusen, Saylor, Neilsen & Kolloff (1990) found that gifted girls in special programs tend to have higher self-esteem than gifted girls who don't attend these programs. This could be a result of the fact that, in comparison with regular educational settings, social acceptance in gifted classrooms is significantly higher (Peperkorn & Gerner, 2020). This is an indication that the educational and social context have a big impact on self-perception and emotional development of gifted girls in early adolescence. By attending intellectually challenging programs and interacting with likeminded individuals gifted girls experience a larger sense of belonging. By feeling encouraged to express and develop their academic interests, they seem to be protected from the consequences of social isolation and underachievement. If given the right social and educational context, so it seems, gifted girls seem to have more pride in their social identity and are more motivated to pursue their intellectual potential. However, how does society know whether or not its current social climate and school-system are adjusted adequately to properly support gifted girls in that pursuit?

s study will hopefully contribute feasible knowledge to that discussion by looking at the competency experience of gifted girls in our current school system.

### **Research questions and hypotheses**

This study aims to provide a comprehensive exploration of two specific aspects of self-perceptive competence experience in early –adolescent gifted girls in comparison to both non-gifted girls and gifted boys of the same age group through quantitative descriptive research. This study will focus on academic self-concept and social self-concept, as well as the relation between general feelings of self-worth and self-perception of academic achievement. Also, by comparing gifted girls to different peer-groups, more insight can be gained on how this specific subgroup perceives itself in the context of the current school system. The results of this study could be indicative of the consequences that segregating gifted children from non-gifted children can have on their self-perception.

First of all, a comparison will be made between the academic self-perception of early-adolescent girls who attend schools for gifted children and academic self-perception of girls who attend regular schools. It seems likely that attending a

ool for exclusively gifted children might give girls a social and educational context in which they can be proud of their academic competence. Just like girls in the study by Nickens (2005), attending a program or curriculum that promotes academic achievement could help them build more confidence and interest in their academic achievement. Peperkorn & Gerner (2020) found that gifted girls have a more positive academic self-perception when attending special programs, than when they only follow the regular curriculum and Yeung, Chow, Chow & Liu (2005) found that self-perception of gifted girls increases in schools for gifted children because of access to more adequate peer-support and a challenging curriculum. However, the age range in these studies is too large to account for the possible negative impact that puberty has on self-perception (Maôano, Ninot, & Bilar, 2004). Since this specific age-group is very prone to peer-perception, it seems likely that they will experience something that has been labeled as the "big-fish-little-pond" effect, which was first introduced by Marsh (1987). Humans, to some degree, tend to compare themselves to their peers when rating their competence. When gifted children are grouped together, they tend to perceive their competence less positive, because they compare their competence to that of their direct peers, instead of that of the national average (Shi, Li, Zhang, 2008). It seems that there are several factors that both positively and negatively impact the academic self-perception of gifted girls. Therefore, it is expected that gifted adolescent girls have an equally positive self-perception of their academic competency as non-gifted girls.

Gifted girls and gifted boys will be compared on the topic of academic self-perception as well. Since gifted boys tend to experience the same problems concerning group conformity and the big-fish-little-pond effect as gifted girls, it is worthwhile to investigate any possible differences concerning their academic competence experience. Any significant differences between these groups could be indicative of either gender-specific risk factors or differential treatment. Since there are no indications of gender-differences, it is expected that gifted adolescent girls have an equally positive self-perception of their academic competency as gifted boys.

Secondly, early-adolescent gifted girls and non-gifted girls will be compared concerning their perception of social acceptance. Since girls in schools for gifted children are surrounded by likeminded individuals, it's likely that they feel a stronger connection to classmates. Gifted girls generally report a more positive self-concept than non-gifted girls (Loeb & Marsh, 1987), but also seem to experience a stronger decline in (among other things) social self-concept during (pre)puberty (Marsh & Zehms, 1996). Since there doesn't seem to be a consensus regarding this aspect of social self-concept in gifted



s, it is worthwhile to be investigated further. In order to determine whether or not gifted girls feel just as socially accepted in educational settings, exclusively for gifted children, as non-gifted girls do in regular educational settings, social competence of gifted girls will be compared to that of non-gifted girls. To the author's knowledge, no studies on social self-concept of gifted girls in schools for gifted children or special programs have recently been published. Therefore, in lack of clear consensus on this topic it is expected that gifted girls have equally positive self-perception concerning their social competency as non-gifted children.

Thirdly, the relationship between academic self-perception and general feelings of self-worth will be compared between gifted girls and non-gifted girls. Košir, Horvat, Aram & Jurinec (2016) found that academic self-perception correlates stronger to general-feelings of self-worth in gifted boys. Peperkorn and Wegner (2020) found this to be the case in girls attending schools or programs for gifted children as well. However, neither of these previous studies focused on the Dutch students. Since there are no indications that our school-system or gifted population is any different, the correlation between academic self-perception and general feelings of self-worth is expected to be stronger in gifted girls than in non-gifted girls.

## **Method**

### *Participants*

Data was collected as part of a large, ongoing project by Leiden Universiteit, called BrightWave. This project is focused on the social-emotional development of gifted and non-gifted young adolescents between the ages of 10 to 12 years. A large battery of various intellectual, emotional, cognitive and social tests will be conducted by roughly 200 children between the ages of 10 and 12 years old. The Brightwave project offers to give short pop-up colleges about the functioning of the brains and giftedness in an effort to stimulate participation.

All participants are children in Dutch elementary school. 48 of the participants attend elementary schools, specifically for gifted children, whereas the other 64 participants attend regular elementary schools. In order to be admissible to any of the schools that participate in the Brightwave project, children need to have an IQ of 130 or above. All participants are in either seventh or eighth grade. Participation in this project is completely voluntarily. The parents and/or caretakers of all participants in this project all have to give written consent for the participation of their children. Participants in this project doesn't receive any monetary compensation. However, they will receive a small educational reward after

completing their participation. The Brightwave project was assessed and approved by Leiden Universiteit's Ethics Committee for Social Sciences and Humanities (SSH).

The data in this research has been taken from sub-samples that were collected in an earlier stage of this project and are therefore smaller than 200. While data collection of the Brightwave project still continues, as of January 2021, 117 participants were initially included. However, 5 participants were removed by another student within the Brightwave project due to a variety of reasons before it was transferred to the current research. One participant was removed because its age was reported to be above the required maximum of 12 years. One participant was removed because its age was wasn't reported at all. Three cases had been removed from the final dataset for unclear reasons and were irretrievable, therefore making it impossible to determine the reason for exclusion. The final dataset consisted of 112 participants, which were divided on gender and school type attendance. Specific sample sizes can be found in table 1.

### *Measurements*

#### Competentiebelevingschaal voor kinderen

The Competentiebelevingschaal voor kinderen (CBSK) is a short multiple-choice questionnaire for children between the age of 4 and 12 which consists of 36 questions about different aspects of the way a child experiences his/her own competence. Each item on the questionnaire presents a statement. The child first has to choose whether this statement lies to him/her and then whether this valence is strong or weak. The CBSK is the Dutch version of the SPPC, the self-perception profile for children (Harter, 1988.) The original version has been revised and has proven to have good validity, reliability and factor structure (Wichstraum, 1995; Muris, Meesters, & Fijen, 2003). It uses six subscales: academic competence perception, perception of social acceptance, perception of physical skills, perception of physical appearance, perception of behavioral attitude and general feeling of self-worth. The raw scores can be converted to a percentile score, which compares the individual's score with those of an age-based norm group. All sub scores combined provide a total score.

*cedure*

data was collected through computerized questionnaires and tasks, performed at school or at home.

stated earlier, data was gathered through the Brightwave project, which used standardized procedures and tests in order to collect data. Schools were contacted by either university professionals or students that were associated with the project.

Parental consent forms had been collected at school by associates of the Brightwave Project, classical and individual testing

arrangements were planned. Even though the collected data from this study were part of a larger test-battery, only the

procedures for the collection of this data will be discussed in this section. Associates of the Brightwave project would

coordinate the classical testing, which were carried out on regular schooldays in specific rooms of that school. The data

from the digitalized test-battery in which the CBSK was included, would be collected digitally through a digital survey-

program called Qualtrics, and was automatically sent to its database after completion.

Participants were given a short explanation of how long this part of the data collection was going to take and how to

access the survey. Associates of the Brightwave project were present in the room while participants were conducting the

survey in order to answer technical questions, but were briefed to help as little as possible with question-interpretation.

After each participant was finished, it was taken back to class or to the individual part of the test battery.

## **Results**

An independent sample T-test test was used in order to test the hypothesis that academic self-perception of early-

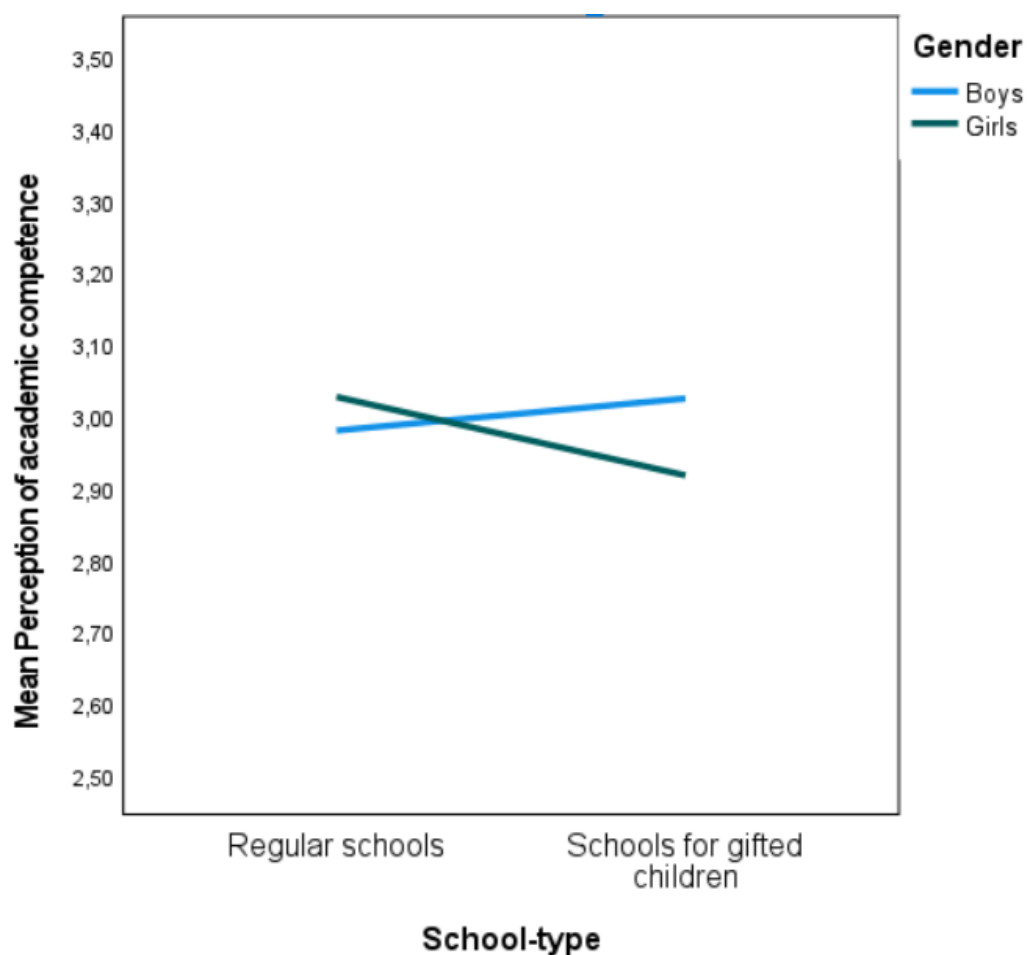
elementary gifted girls isn't higher or lower than academic self-perception of non-gifted girls. The dependent variable was

academic self-perception and the independent variable was school-type. Also, a filter was applied to exclude all cases

corresponded to male participants. No significant difference was reported between academic self-perception of gifted girls ( $M = 2.917, SD = .674$ ) and non-gifted girls ( $M = 3.026, SD = .716$ ),  $t(50) = .548, p = .586$ . Thus, it can be concluded that gifted girls who attend schools, exclusively for gifted children do not have a better or worse perception of their academic competency than girls, who attend regular schools. These findings are in line with the initial hypothesis. Also, no significant difference was reported between academic self-perception of gifted boys ( $M = 3.024, SD = .631$ ) and non-gifted boys ( $M = 2.979, SD = .506$ ),  $t(58) = -.304, p = .762$ .

An independent sample T-test was used in order to test the hypothesis that academic self-perception of early-adolescent gifted girls isn't higher or lower than academic self-perception of early-adolescent gifted boys. The dependent variable was academic self-perception and the independent variable was gender. A filter was applied to the "school-type" variable in order to only account for schools for gifted children. No significant difference was reported between academic self-perception of gifted girls and gifted boys,  $t(46) = .565, p = .586$ . Thus, it can be concluded that gifted girls who attend schools, exclusively for gifted children do not have a better or worse perception of their academic competency than gifted boys who attend schools, exclusively for gifted children. These findings are in line with the initial hypothesis, claiming that there are no significant differences between academic self-perception in schools for gifted children, based on gender. Figure 1 gives a more detailed visual representation of the division between mean scores of the different groups on self-perception of academic competence.

**Figure 1**  
*Mean scores of perception of academic competence as a function of school-type and gender*



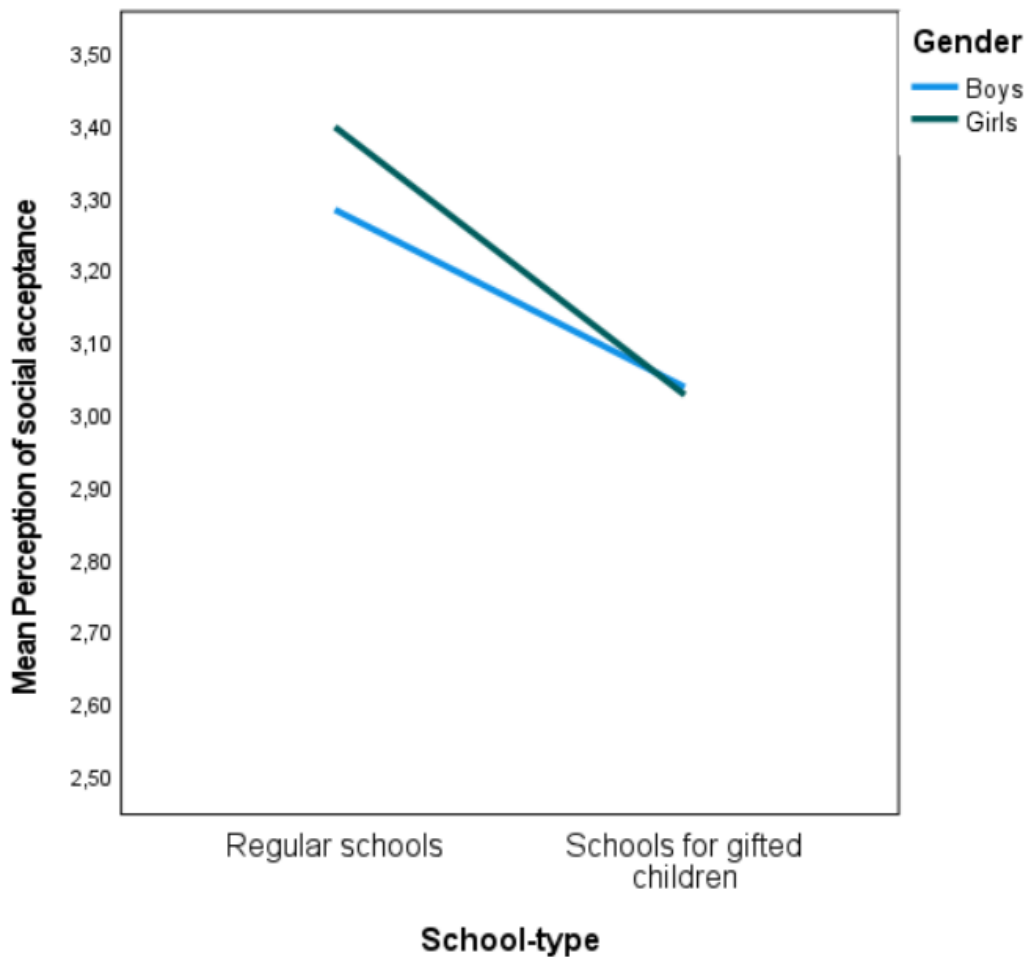
*e: all mean scores of the groups that were included in this study based on both gender and school type. Gifted girls are notably lower than any other group, though not significantly.*

An independent sample T-test was used in order to test the hypothesis that perception of social acceptance of early-lescent gifted girls is higher than perception of social acceptance of early-adolescent non-gifted girls. The dependent variable was mean social self-perception and the independent variable was school-type. A filter was applied to the “gender” variable in order to only account for girls. Gifted girls ( $M = 3.025, SD = .6$ ) scored significantly lower than non-gifted girls ( $M = 3.396, SD = .639$ ) on perceived social acceptance,  $t(50) = 2.083, p = .042$ . Thus, it can be concluded that gifted girls who attend schools, exclusively for gifted children have a less positive perception of their how well they are socially accepted by others than girls, who attend regular schools. These findings contradict the initial hypothesis, which claimed that gifted girls have a more positive perception of their social acceptance. These results suggest that self-perception of social acceptance in gifted girls is not higher, but significantly lower than that of non-gifted girls. The effect size for this

lysis ( $d = .624$ ) was found to exceed Cohen's (1988) convention for a medium effect ( $d = .50$ ). When comparing gifted girls ( $M = 3.034, SD = .678$ ) to non-gifted boys ( $M = 3.281, SD = .734$ ) on social acceptance, no significant difference is reported  $t(58) = 1.34, p = .186$ . However, when comparing gifted children ( $M = 3.031, SD = .64$ ) to non-gifted children ( $M = 3.339, SD = .685$ ) on social acceptance, gifted children score significantly lower  $t(110) = 2.416, p = .017$ . The effect size for this analysis ( $d = .666$ ) was found to exceed Cohen's (1988) convention for a medium effect ( $d = .50$ ) Figure 2 gives a more detailed visual representation of the division between mean scores of the different groups on self-perception of academic competence.

## Figure 2

*in scores of perceived social acceptance as a function of school-type and gender*



*e: all mean scores of the groups that were included in this study based on both gender and school type. Gifted children are significantly lower on perception of social acceptance. When genders are compared individually, the only difference that remains significant is the difference between girls.*

Lastly, the correlation between variables academic self-perception and general feelings of self-worth between gifted boys and non-gifted girls were compared by performing a Z-test on the correlation-coefficient  $r$  of these variables. Though gifted girls scored slightly higher ( $r = .275, p = .251$ ) than non-gifted girls ( $r = .232, p = .201$ ), this difference was not significant ( $p = .15, p = .88$ ). It is also noteworthy to state that both correlations themselves were insignificant. The implications of these findings will be discussed further in the discussion section.

## **Discussion**

This study researched possible differences on academic and social self-perception between early-adolescent gifted girls and non-gifted girls and gifted boys. Multiple comparisons have been made on self-perception of academic functioning and self-perception of social acceptance, yet only two differences were found, those being the difference between social self-perception of gifted versus non-gifted girls and the difference between social self-perception of gifted versus non-gifted



dren in general. These findings indicate that gifted children are less positive about their social skills and how others might perceive them in terms of social interaction. No differences have been found between gifted girls and non-gifted girls on self-perception of academic functioning. Also, self-perception of academic functioning doesn't correlate stronger to overall feelings of self-worth in gifted girls than it does in non-gifted girls. No differences have been found between gifted girls and gifted boys on self-perception of academic functioning.

Gifted girls score no differently on academic self-perception than either gifted boys or non-gifted girls. This conclusion is in line with the first two hypotheses of this study, stating that there are no differences between academic self-perception of gifted girls and non-gifted girls or gifted boys. These findings contradict those of Peperkorn & Wegner (2020) and those of Yeung, Chow, Chow & Liu (2005) who both found that grouping gifted children together in special programs has a positive effect on their academic self-perception in comparison to both gifted and non-gifted children, who don't attend special programs. However, these findings are in line with the big-fish-little-pond effect (Marsh, 1987), which states that grouping gifted children together in classes or special programs tends to decrease their academic self-perception. Since the academic self-perception of gifted boys, reported in the current study, is just as high as it is in gifted girls, it seems as if the big-fish-little-pond effect affects gifted boys just as much as gifted girls.

The contrast between the findings of this study and previous ones could be explained by the age of the participants in this study. Only children between the ages of 10 and 12 were selected for this study because this age-group experiences the onset of puberty. Puberty sets in motion various physiological processes, such as heightened fear of social exclusion (Cassian et al. 2010) and discrepancies between growth in the areas of the brain that are associated with emotion and the areas of the brain that are associated with rational thinking (Casey, Getz and Galvin, 2008). Therefore, it seems likely that participants in this study could have been influenced more strongly by peer perception than gifted children in the studies of Peperkorn & Wegner (2020) and Yeung, Chow, Chow & Liu (2005), which both had a wider range of age for their participants. In other words, the gifted participants in this study knew that, objectively, they are academically more competent than most others of their age. However, based on their scores it seems very likely that they compare themselves to the children in their direct environment and conclude that within this group they are average or just above average.

se results indicate that the “big fish little pond” effect (Marsh, 1987) has an effect on children who attend schools, lusively for gifted children.

Gifted girls have a less positive perception of their social competence than non-gifted girls, which contradicts the d hypothesis, claiming that gifted girls don't have a worse or better self-perception than non-gifted girl. These results are ne with previous findings (Klein & Zehms, 1996; Lea-Wood & Clunies-Ross, 1995), who found a stronger decline in al-self-perception of 8-to 13-years-old gifted girls in comparison to non-gifted girls. However, they seem to contradict findings of Lee, Olszewski-Kubilius, & Thomson (2012), claiming that interpersonal competence experience of gifted s is generally more positive than that of non-gifted girls. Gifted children are known to have advanced cognitive and al development (Robinson, 2008), therefore possible that they will experience the decline in self-perception that is rally associated with puberty (Maôano, Ninot & Bilard, 2004; Labbrozzi, Robazza, Bertollo, Bucci & Bortoli, 2013) at arlier age than non-gifted children. It is possible that gifted children develop an understanding of the social processes are at play in group-dynamics and the factors that influence people's perceptions of others at a younger age than non-ed children. Children have to be aware of the perceptions that others have of them before they are able to properly adapt r behavior in order to conform to the social norms of their peers. Since gifted children seem to be burdened more by ng unable to conform to social norms between the age of 10 and 13, it is possible that they are more aware of their lack daptability and will therefore also learn how to adapt their behavior properly at a younger age than non-gifted children ld. Therefore, it would be interesting to further investigate whether or not gifted children experience the increase in -perception at an earlier age than non-gifted children.

Lastly, gifted girls base their general feelings of self-worth just as much on academic self-perception as non-gifted s do, contradicting the fourth hypothesis which claims that this correlation is stronger in gifted girls. These findings tradict the current consensus as found by Košir, Horvat, Aram & Jurinec (2016) and Peperkorn and Wegner (2020), o both stated that the correlation between academic self-perception and general feelings of self-worth is stronger in ed children than it is in non-gifted children. It is not clear why this study yielded different results than previous studies his specific topic, but one possible explanation would be that Dutch children attribute specific aspects of their eception of self differently to their general feelings of self-worth. Differences in self-perception profiles have been

tributed to differences in culture before (Stigler, Smith, & Mao, 1985), yet this subject should be researched much more before it would be possible to attribute differences in self-perception profiles to cultural differences.

To briefly summarize the findings of this study: gifted girls have the same self-perception of their academic achievement and its attribution to general feelings of self-worth as other children, but have lower self-perception of their self-perception of social acceptance than non-gifted girls. Gifted children have lower self-perceptions of their social acceptance than non-gifted children when accounting for boys and girls combined, yet gifted boys don't have a lower perception of their social acceptance when only combined to other, non-gifted boys.

### *Strengths and shortcomings*

Removing children from schools which are exclusively for gifted children and directly comparing them with non-gifted children on basis of school-type is something that has not been done often and has therefore received relatively little attention in previous literature. Because of the accelerated rate in which giftedness is being identified in girls, it's becoming ever more important to make educational settings for gifted children that are balanced concerning gender. Because of this, a unique insight is gathered in how socio-emotional development occurs in these children when they are surrounded by likeminded and equally intelligent peers. Because the study (and Brightwave project in its whole) utilizes this particular design, its findings contribute to larger discussions concerning the nature of isolation-tendencies in giftedness and the big-fish-big-pond effect.

Another strength of this study is that it gives a reflection of how children between ten and twelve years old currently feel about themselves. Our society is rapidly changing on a continuous basis. This study reflected that both gifted children and non-gifted children feel like they are averagely competent concerning their academic skills, both in specifically segregated and integrated (average-ability) schools. This indicates that the self-perception of children between the ages of ten and twelve isn't worryingly low as of now. However, if either both or one of the school-types that provided data for this study had lower academic achievement scores that would be considered to be very low, it would have implicated very large and serious problems within its respective school-system. Therefore, it is very important to regularly check how children

about concepts such as emotional self-perception, happiness and competence experience. Ideally by doing so, society identify the factors that influence children's' self-perception more quickly and respond to it adequately.

Some of the results from previous research, that have been referenced in this study concerning self-perception and (under)representation in gifted programs, might be a less representative reflection of how gifted girls feel as of now in the Netherlands. Because of global differences between concepts such as emancipation and gender roles, which can be vastly different between countries, it is possible that research in those respective countries would yield different results for roughly the same demographic. The same could be said for studies that have been carried out relatively long ago, either in the Netherlands or another country. Emancipation and gender roles can change over a certain course of time within a country as well. However, more research into this topic is needed to substantiate such a correlation, and to the author's knowledge, no instruments have yet been developed to adequately measure these differences (if that would be possible at all). Therefore, in lack of a consensus on this topic, it seems that caution should be used when generalizing results from studies on self-perception of women. It seems best to focus on studies that were carried out within the Dutch population and school-system and build our frame of reference as much as possible on studies that used participants in this population. Only then can we develop a better understanding of the specific factors that influence self-perception in this specific group.

It is also important to note that the gifted children in most of the previous studies attended the same classes as their non-gifted counterparts. A lot of research on gifted adolescent girls incorporates the identification of gifted girls in their research design in regular educational settings. This indicates that actually very few of the gifted girls in these studies are ever aware of their giftedness or are given special treatment because of it. Because they didn't receive any special treatment or acknowledgement, it seems like the girls in these studies have had very different experiences at school than the non-gifted girls who participated in this study.

Another shortcoming of this study was its inability to directly compare gifted girls attending schools for gifted children with gifted girls attending regular schools because of lack of a standardized intelligence testing in the provided test battery. This study would have been able to conclude much more about the impact of segregation versus integration of gifted girls in our school-system if it had been possible to directly observe the difference and similarities in self-perceptive aspects of this group. By not being able to separate gifted girls from the rest of the children that attend regular schools it is impossible

ook at this group specifically. On top of that, by not excluding the gifted children or gifted girls from the regular school sample, it is possible that the cases, representing these gifted girls, have skewed the dataset and masked any potential differences. In this research, no differences were found between children attending either regular schools or schools which exclusively for gifted children. Since this study was unable to distinguish those subgroups, it was impossible to find its possible differences. For example, if the gifted children attending regular schools, had a much higher score on academic self-perception than the non-gifted children on those schools, as would be expected through the big-fish-little-pond effect (Marsh, 1987), the average of those groups would be higher than it would have been when just measuring non-gifted children. This would not only be indicative of a more complex framework concerning specific aspects of self-perception, it could also give more insight in how attending regular schools or schools, specifically for gifted children affects specifically gifted children.

#### *Questions for future research*

Since this study only compared gifted children in schools for gifted children with all children attending regular schools and not specifically gifted children attending regular schools, it still seems unclear whether or not gifted girls attending schools for gifted children have different self-perception profiles than gifted girls attending regular schools. By researching this further and by incorporating a larger age range (or even longitudinal design), much more can be learned about the potential impact these different approaches to social settings on gifted girls can have. Just like any other child, the social and academic needs of a gifted child need to be met and accommodated by the Dutch school system. Hopefully, future research can be able to provide a model of the specific factors that contribute to the self-perception and general feelings of self-worth for both gifted and non-gifted children. Since psychopathology is continually increasing in the adolescent population (CBS, 2021), the need for preventive and interventive measures will likely grow in the years to come. As is the case in any other empirical based practice it is of fundamental importance to acquire a comprehensive understanding of how self-perception works and develops over the years in order to develop such measures.

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