

**Social Status and Status Motivations: The Association between the Wish for Popularity  
and Social Status in Late Childhood**

Dorien Huijser (4174259)  
[d.c.huijser@students.uu.nl](mailto:d.c.huijser@students.uu.nl)

Linde Lichtenberg (4131401)  
[l.lichtenberg@students.uu.nl](mailto:l.lichtenberg@students.uu.nl)

Bachelor Liberal Arts and Sciences: Artificial Intelligence thesis

First supervisor: dr. Aart Franken

Second supervisor: dr. Janneke van Lith

University of Utrecht

7.5 ECTS

July 2016

## Contents

<b>Abstract</b>	p. 3
<b>Introduction</b>	p. 4
Popularity	p. 5
<i>Author:</i> Dorien Huijser	
Likeability	p. 7
<i>Author:</i> Linde Lichtenberg	
Popularity and likeability: compatibility of the constructs	p. 8
<i>Author:</i> Dorien Huijser	
Prioritising social status and actual social status	p. 9
<i>Author:</i> Linde Lichtenberg	
Current study	p. 11
<i>Authors:</i> Dorien Huijser and Linde Lichtenberg	
<b>Method</b>	p. 13
<i>Authors:</i> Dorien Huijser and Linde Lichtenberg	
<b>Results</b>	p. 17
<i>Authors:</i> Dorien Huijser and Linde Lichtenberg	
<b>Discussion</b>	p. 26
Discussion of the results	p. 26
<i>Author:</i> Linde Lichtenberg	
Implications	p. 30
<i>Author:</i> Dorien Huijser	
Strengths	p. 32
<i>Author:</i> Linde Lichtenberg	
Limitations and further research	p. 32
<i>Author:</i> Dorien Huijser	
<b>References</b>	p. 35

### **Abstract**

This study investigated the association between prioritising popularity and how important children deemed popularity generally, and actual social status. It was expected that popularity and likeability would both be associated in their own specific ways with either prioritising popularity or finding popularity generally important. Participants were eight to thirteen year old primary school children. 452 children (50% girls) from eight primary schools in the Netherlands filled in several questionnaires on peer relations and prioritising popularity. Correlational tests and multiple regression analyses were conducted. Results indicated that both prioritising popularity and the general importance of popularity were positively associated with popular status, whereas likeability was only associated with prioritising popularity. Furthermore, the general importance of popularity was less related to popularity for well-liked children than for less-liked children. Implications of the results and suggestions for further research are discussed. The results contribute to knowledge on status motivations, and can contribute to improving simulations of human social intelligence to create interactive trainings, serious games, or intelligent agents that can obtain a high social status in a human-like fashion.

*Keywords:* popularity, likeability, prioritising popularity, peer relations, social status

## Introduction

Social status is an important concept to study, since gaining and maintaining social status seems to be very important for young individuals (Dijkstra, Cillessen, Lindenberg & Veenstra, 2010). A high social status helps gain support from others, access to potential friends, and predicts healthy social functioning later in life (Van der Linden, Scholte, Cillessen, Nijenhuis & Segers, 2010). Contrastingly, having a low social status has been associated with psychological problems such as depression (Oldehinkel, Rosmalen, Veenstra, Dijkstra & Ormel, 2007), although the direction of this association is still debated upon.

Two types of social status have been studied extensively (Oldehinkel et al., 2007): popularity (also called sociological or perceived popularity) and likeability (i.e., sociometric popularity, or peer preference). Although there is some overlap between popularity and likeability, the constructs also differ (see Mayeux, Sandstrom, & Cillessen, 2008; Parkhurst & Hopmeyer, 1998). Firstly, popularity can be defined in terms of achievement, or being admired. This conceptualisation suggests that one can obtain a high social status by being better than others. It thus contains an element of competition, and therefore, it is impossible for everyone to be popular. Secondly, likeability is usually defined in terms of affection, or being liked by peers (Dijkstra et al., 2010). Thus, whereas popularity involves a competition with peers, likeability does not.

Although both popularity and likeability have been extensively investigated (e.g., Cillessen & Rose, 2005), the importance that children attribute to being popular has not. Especially the association between attributing importance to popularity and actual social status remains understudied. In this study, the association between the wish for popularity and actual social status was investigated among primary school children. Two aspects of the wish for popularity were studied: prioritising popularity over other domains, and a general tendency to desire popularity. Studying the association between the wish for popularity and

actual social status helps gain insight in the developmental process and motivational aspects of social status in the peer group. This study contributes to the new artificial intelligence research area of social computing. This area of research focuses on ICT technologies that take the social context into account (Wang, Carley, Zeng & Mao, 2007). In attempting to incorporate human social behaviour into the digital world, social computing contributes to the development of strong artificial intelligence, using social psychology (Wang et al., 2007). Studying the interplay between the wish for popularity and social status will help gain insight in the dynamic social environment of children and the motivational aspects of social status in the peer group. This knowledge in turn can be useful in creating computer-modeled learning situations, where an optimal balance between obtaining popularity and maintaining likeability is important. This can be important in several areas such as trainings and serious games, that are very much life-like and therefore highly valuable.

Firstly, we discuss what is currently known about popularity and likeability, the compatibility of the constructs and about measures of the importance of popularity currently available. In the method section, we describe our participants, procedure, measures and data analyses. In the results, we present the results of the testing of our hypotheses. Finally, in the discussion, we discuss our results, implications, and suggestions for further research.

## **Popularity**

Popularity was defined by Van der Linden et al. (2010) as “the extent to which one has prestige and influence in a group” (p.669). Who is popular is often determined by peer nominations, i.e., by asking participants who are popular, without providing an a priori definition of the construct (Agan, Costin, Deutz, Edelsbrunner, Záliš & Franken, 2015; Cillessen & Rose, 2005). Popularity is a reputational variable: rather than asking participants who *they* believe are popular, participants are asked which of their classmates *are* popular

(Rose, Swenson & Waller, 2004; Nangle, Erdley & Gold, 1996). The construct of popularity seems to be relatively stable over time (LaFontana & Cillessen, 1998): there is often a high peer group consensus for reputation, because nominations for popularity involve judgments about what peers value, and the consensual norms of the peer environment (Rodkin, Ryan, Jamison & Wilson, 2013).

Many young individuals aim to be popular (Rose et al., 2004; Cillessen & Rose, 2005; Rodkin et al., 2013). An important reason for affiliating with popular peers might be the desire of earning a higher social status (Dijkstra et al., 2010). Specifically, popular children are often considered to have high social power over group norms and in determining desirable behavioural patterns (Cillessen & Rose, 2005; Lease, Kennedy & Axelrod, 2002). They can be seen as “successful resource controllers in the peer group” (Hawley, 2003, p.283). This kind of peer influence is likely to be appealing for young individuals, possibly giving rise to the desire of many children and adolescents to be popular.

Popular children are often characterised as socially dominant, prominent, well-known among their peers (Cillessen & Rose, 2005; Lease et al., 2002; Merten, 1997; Rose et al., 2004; Parkhurst & Hopmeyer, 1998), attractive (De Bruyn & Van den Boom, 2005; Merten, 1997; Rose et al., 2004), athletic, and having desirable possessions (Rose et al., 2004). Popular youth seem to show both prosocial as well as antisocial behaviours (Sandstrom & Cillessen, 2006; Rose et al., 2004; see for example Hawley, 2003). Prosocial behaviours can include being helpful and friendly (Agan et al., 2015; Van den Berg, Burk & Cillessen, 2015). Antisocial behaviours can include being aggressive, manipulative, domineering (Sandstrom & Cillessen, 2006; Cillessen & Rose, 2005; Lease et al., 2002; De Bruyn & Van den Boom, 2005), bossy and even exhibiting bullying behaviours (Van den Berg et al., 2015). According to Hawley (2003), it is specifically the balance between pro- and antisocial behaviours that might enable popular children to be seen as effective and socially central.

Indeed, relationally aggressive youth who were socially efficient, leaders, cooperative, and sociable, have been shown to be more popular than relationally aggressive youth who exhibited low levels of these characteristics (Puckett, Aikins, & Cillessen, 2008). In sum, popularity is desirable for youth and might only be obtained by a few children per classroom. Also, both positive as well as negative behaviours might be employed to gain or maintain a popular status.

### **Likeability**

Likeability, like popularity, has no single, fixed definition. The concept might however be described as “the extent to which one is considered as friendly and cooperative” (Van der Linden et al., 2010, p.669). Like popularity, the construct is often assessed using peer nominations (Cillessen & Rose, 2005), i.e., children are asked who they, personally, like (Rodkin et al., 2013). Likeability is therefore based on a personal impression, instead of it being a group construct like popularity. Also, as who you personally like most tends to change over time, likeability is a less stable phenomenon than popularity (LaFontana & Cillessen, 1998).

Likeability is a benefit often sought after by children and adolescents (Dijkstra et al., 2010). Humans possess a fundamental ‘need to belong’, and being liked can provide social support and offer protection from being excluded from a group (Fiske, 2004). Thus, being liked can be a desirable form of social status. Well-liked children generally have positive beliefs and feelings about their own social functioning. Moreover, they generally fit in well in the peer group, and therefore develop a positive social identity (Dijkstra et al., 2010).

Well-liked children generally possess mainly positive characteristics. They often display high levels of prosocial behaviours (Cillessen & Rose, 2005) and characteristics, such as friendliness (Van den Berg et al., 2015; Parkhurst & Hopmeyer, 1998), helpfulness (Agan

et al., 2015), cooperation, sociability, kindness, and leadership (Sandstrom & Cillessen, 2006). Liked children are generally extraverted, agreeable and emotionally stable (Van der Linden et al., 2010), possibly giving rise to the emotionally well-adjusted child with high-quality friendships, that fits the profile of a liked child (Cillessen & Rose, 2005). Within the peer system, liked children are often assertive children with strong leadership skills, but they are not likely to draw much attention to themselves (Lease et al., 2002). As opposed to popularity, likeability is not characterised by negative behaviours: it is positively associated with low levels of aggression (Van der Linden et al., 2010), and negatively associated with being bossy, bullying, victimisation and withdrawn behaviour (Van den Berg et al., 2015). Thus, unlike popular children, there is less competition for being well liked: liked children do not impose their own social goals on others, are less likely to behave in disruptive ways and do not interfere with the goal achievement of others.

### **Popularity and likeability: compatibility of the constructs**

Popular children are not always well-liked and vice versa (De Bruyn & Van den Boom, 2005). This might be because of the aspect of competition that popularity entails (Dijkstra et al., 2010): the negative behaviours associated with popularity might reduce likeability, so that being popular *and* being liked seems like a difficult status to gain. To illustrate this trade-off, Merten (1997) gives an example of why a clique of popular girls felt they had to be mean:

[However, ] to be known for being both popular and nice, a girl could not be nice only when she felt like it or when it served her purpose; she had to be consistently nice to everyone - supernice. [...] Hence, girls who had worked hard to be popular felt that having to be nice diminished what they had gained - a feeling of specialness,



symbolized by the social distance between them and their less popular peers. [...] This is where meanness became an alternative between the pitfalls of being stuck-up and the burden of being supernice - an alternative that preserved popularity at the same time that it allowed its indirect expression. (p.188)

The incompatibility of being both popular and liked varies with age: popularity and likeability start out quite similar (De Bruyn & Van den Boom, 2005; Agan et al., 2015; Sandstrom & Cillessen, 2006), but this similarity decreases with age (Cillessen & Mayeux, 2004; Lease et al., 2002). The distinction between popularity and likeability might start taking shape in third grade and might further be refined after eighth grade. Indeed, Rodkin et al. (2013) found that third to fifth graders (age 8-11) already differentiated between being liked and being popular. However, Van den Berg et al. (2015) found that the distinction between popularity and likeability was not necessarily made in earlier grades, and that only after grade eight (around age 14) children started to differentiate between the two constructs. This was also evident when identifying behavioural subtypes. Whereas before grade 8 there was a popular-liked subtype that very much resembled that of likeability, afterwards, popularity became progressively more associated with antisocial behaviour, whereas likeability did not (Van den Berg et al., 2015; Rose et al., 2004). In sum, whereas it might be difficult to be both popular and liked, this might be less difficult for children compared to adolescents.

### **Prioritising social status and actual social status**

In late childhood, youth start to increasingly value having a high social status (LaFontana & Cillessen, 2010; Dijkstra et al., 2010). Also, during these years, popularity and likeability become two distinct and largely incompatible constructs (De Bruyn & Van den

Boom, 2005). Therefore, older children might have to discover if they would be willing to prioritise popularity over other social domains. However, especially among children, studies investigating the balance between prioritising popularity and social status are lacking. LaFontana and Cillessen (2010) defined prioritising popularity as “the willingness to compromise other priorities in favor of status [i.e., popularity]” (p.140). It thus entails preferring popularity to other domains, including likeability. Prioritising popularity increases across primary school and peaks in early adolescence (LaFontana and Cillessen, 2010). Also, boys at all ages prioritise popularity more than girls, who place a higher priority on maintaining dyadic relationships (LaFontana and Cillessen, 2010). Moreover, prioritising popularity was not associated with popularity for adolescent girls, but moderately for adolescent boys (Cillessen et al., 2014). Thus, gender differences in prioritising popularity might be expected. Furthermore, prioritising popularity seems to strengthen the association of popularity with antisocial and risk behaviours, and leadership (Van den Broek, Deutz, Schoneveld, Burk & Cillessen, 2015; Cillessen, Mayeux, Ha, de Bruyn & LaFontana, 2014). Therefore, prioritising popularity will possibly come at the cost of being less liked. In sum, prioritising popularity, among older children, has been associated with negative behaviours, and might be found more among boys than among girls.

Other studies have investigated a general tendency for the desire to be popular, rather than prioritising popularity over other domains. For example, Rodkin et al. (2013) found that children in third grade who indicated that popularity was important to them, became more popular two years later. In our study, we investigated whether children differentiated between prioritising popularity and this general wish to be popular.

### **Current study**

In sum, the two main forms of social status, popularity and likeability, are important to children, but also difficult to maintain simultaneously. However, little is still known about prioritising popularity in late childhood, especially in relation to actual social status. This study aimed to investigate the association between indices of the wish to be popular and actual social status, i.e., popularity and likeability, in late childhood. For exploratory purposes, we investigated whether there is a difference between *prioritising popularity* over other domains, and indicating that popularity is important in general (i.e., *general importance of popularity*).

Firstly, *prioritising popularity* was expected to be positively associated with actual popularity: popular children were expected to be more willing to prioritise popularity over other domains than non-popular children (hypothesis 1a). Secondly, children who prioritise popularity were expected to be less liked compared to children who do not, as children who prioritise popularity might be likely to behave in ways which make them less liked (hypothesis 2a). Thirdly, gender differences were expected. Following LaFontana and Cillessen (2010), it was expected that boys are more likely to prioritise popularity than girls, and that the association between prioritising popularity and actual popularity is stronger for boys than for girls (hypothesis 3a). Also, we investigated whether the association between prioritising popularity and actual popularity differed depending on levels of children's likeability (hypothesis 4a).

In line with prioritising popularity, the *general importance* children give to popularity was expected to be positively associated with actual popularity (hypothesis 1b). However, in contrast to prioritising popularity, it was expected that the general importance of popularity is not negatively associated with being well-liked (hypothesis 2b). Thirdly, compared to girls, it was expected that boys deem being popular more important, and that the association between

the general importance of popularity and actual popularity is stronger for boys than for girls (hypothesis 3b). Also, we investigated whether the association between the general importance of popularity with popularity differs depending on the level of children's likeability (hypothesis 4b). Lastly, it was investigated whether prioritising popularity and the general importance of popularity interact in predicting popular status (hypothesis 5).

## Method

### Participants

Participants were 452 Dutch children with an average age of 10.6 years ( $SD = 0.86$ , age range 8-13). In total, eight primary schools participated, with grades ranging from grades 5 to 8 (approximately grades 3-6 in the United States). A passive consent procedure was used for parental consents, meaning that parents were informed about the study and their consent was assumed if they did not object their children's participation. Furthermore, participation was on a voluntary basis for the children; children were allowed to quit participating at any moment. This procedure is frequently used in studies using social networks (e.g., LaFontana & Cillessen, 2010; De Bruyn & Van den Boom, 2005; Sandstrom & Cillessen, 2006; Van den Berg et al., 2015). Seventeen children did not participate, because they or their parents did not wish them to take part in the study. One child did not participate because of a lack of proficiency in Dutch. Four participants were later excluded due to missing or invalid data. The remaining sample used for analysis thus included 448 participants, consisting of 213 boys and 235 girls. Most (425) participants were of Dutch origin, nine had a different European ethnicity and fourteen had a non-European ethnicity.

### Procedure

Participants filled in several questionnaires related to peer relations and prioritising popularity, which they completed on laptops. Participants were instructed to fill in the questionnaires honestly and in silence. It was stressed that answers were stored without any linkages to the participants' names to guarantee anonymity, and that there were no wrong or right answers. Three researchers were present in each classroom to ascertain that no one was talking and to potentially answer questions. In order to create a safe environment, children filled in the questionnaires in their own classroom, having a privacy shield set up left and

right of their laptops so that others could not read their answers. Completion of the questionnaire lasted at maximum 1.5 hours. After having filled in the questionnaires, participants were given a small present, consisting of some coloured sticky notes in order to thank them for their participation.

## Measures

**Prioritising popularity.** A Dutch version of the prioritising popularity questionnaire developed by LaFontana and Cillessen (2010) was used (see Cillessen et al., 2014). This questionnaire contains ten vignettes that present participants with dilemmas based on everyday life. Participants are asked how they would respond when given a choice between two actions representing different priorities, one of which is always associated with popularity. The other option benefits another domain of participants' social lives, namely maintaining a friendship, pursuing a romantic relationship, showing compassion for a rejected peer, conforming to behavioural norms, and achieving personal athletic or academic success. For example, participants were asked to imagine having to choose teammates for a basketball game. They had to choose between a popular peer who is not a good basketball player, and a very unpopular but excellent basketball player. Participants were asked to indicate how likely it is that they will choose the popular peer, who is not good at basketball, and how likely it is that they will choose the unpopular peer, who is good at basketball.

There were two items per subscale, consisting of a 6-point Likert scale, ranging from a low to a high priority for popularity. After appropriate recoding, all answers were averaged to calculate a total score per participant on a scale from 1 to 6, where a higher score indicated a higher general priority for popularity over other domains.

**General importance of popularity.** As an alternative measure of the wish for popularity, there was a 6-point Likert-scale item asking how important participants deemed

being popular. Participants were asked to indicate how important they deemed being popular, ranging from ‘not important’ (1), to ‘very important’ (6). This item will be further referred to as the general importance of popularity. This question has successfully been used in previous studies (e.g. Rodkin et al., 2013).

**Social status.** Social status was assessed using peer nominations, where participants were asked to select classmates matching certain descriptions. There were two measures of popularity: ‘Who do you think is most popular?’ and ‘Who do you think is least popular?’, and two measures of likeability: ‘Who do you like most?’ and ‘Who do you like least?’. These measures are frequently used to assess social status (e.g., Van den Berg et al., 2015; Sandstrom & Cillessen, 2006; Parkhurst & Hopmeyer, 1998; Rose et al., 2004; Shoulberg et al., 2011). Participants were not allowed to nominate themselves, but they were allowed to nominate an infinite number of same and cross gender classmates. Unless explicitly stated, most-popular nominations were used as an indicator of popular status, and most-liked nominations as an indicator of likeability. Status scores were divided by the number of possible nominations within each classroom, to take differences in classroom size into account. Participants thus obtained a score between zero (nominated by no classmates) and one (nominated by all classmates). Before analysis, these scores were standardised and used as popularity and likeability indicators.

### **Data analysis**

All data were encoded and analysed using IBM SPSS Statistics 23.0. For hypotheses 1 and 2, testing the association between the wish for popularity and social status, Pearson’s product-moment correlation was used. We included scores for prioritising popularity, the general importance of popularity and Z-scores of most-popular, least-popular, most-liked, and least-liked nominations. For hypothesis 3, testing for gender differences, a two-tailed

independent samples t-test was used, supplemented by a multiple regression analysis. For the other hypotheses (hypotheses 4 and 5), several multiple regression analyses were conducted. For interpretation of the results, a significance level of .05 was used. For correlations, in line with Cohen (1988), a value between 0.10 and 0.30 was considered a weak correlation, one between 0.30 and 0.50 as moderate, and one greater than 0.50 as strong.



## Results

### Descriptive statistics

Means and standard deviations of all study variables in total and per gender are shown in table 1. The table shows that on average, boys scored higher than girls on almost all study variables, with the exception of most-liked nominations. The results of the Pearson's product-moment correlation analysis are shown in table 2. To investigate possible gender differences, the same correlation analysis was carried out for boys and girls separately, see table 3.

**Table 1**

*Descriptive statistics for all study variables in total and per gender*

	Total <i>M (SD)</i>	Boys <i>M (SD)</i>	Girls <i>M (SD)</i>
Prioritising popularity	2.68 (.72)	2.75 (.71) <sup>a</sup>	2.61 (.72) <sup>b</sup>
General importance of popularity	3.29 (1.60)	3.49 (1.61) <sup>a</sup>	3.11 (1.58) <sup>b</sup>
Most popular	0 (.98)	.14 (1.08) <sup>a</sup>	-.13 (.84) <sup>b</sup>
Least popular	0 (.98)	-.23 (.81) <sup>a</sup>	.15 (1.05) <sup>b</sup>
Most liked	0 (.98)	.06 (1.03) <sup>a</sup>	0 (.94) <sup>a</sup>
Least liked	0 (.98)	.11 (1.10) <sup>a</sup>	-.12 (.84) <sup>b</sup>

*Note:* Range N: range of number of participants. Most-popular, most-liked, least-popular and least-liked are Z-scores. Different superscripts (a/b) indicate a significant difference between genders.

First, the associations between the main study variables were assessed. Table 2 indicates that most-popular nominations and most-liked nominations were moderately correlated ( $r = .262, p < .001$ ), as were least-popular nominations and least-liked nominations ( $r = .309, p < .001$ ). As expected, most-popular and least-popular nominations correlated negatively ( $r = -.432, p < .001$ ), as was the case for most-liked and least-liked nominations ( $r = -.417, p < .001$ ). These results were comparable when looking at girls and boys separately, see table 3. The results suggest that for these children, for both genders, popularity and likeability were moderately associated, but also distinct concepts. Moreover, prioritising popularity and the general importance of popularity were moderately associated ( $r = .217, p < .001$ ).

**Table 2**

*Correlations between main study variables (N = 448 - 486)*

	1.	2.	3.	4.	5.	6.
1. Prioritising popularity	1	.217**	.097*	-.039	-.045	.142**
2. General importance of Popularity		1	.288**	-.154**	-.006	.087
3. Most popular			1	-.432**	.262**	.031
4. Least popular				1	-.346**	.309
5. Most liked					1	-.417**
6. Least liked						1

Notes: \*  $p < 0.05$  \*\*  $p < 0.01$ .

**Table 3**

*Correlations between main study variables per gender (N boys=213-214, N girls=235-237)*

	1.	2.	3.	4.	5.	6.
1. Prioritising popularity		.205**	.073	.028	-.152* <sup>a</sup>	.216**
2. General importance of popularity	.210**		.268**	-.147*	-.080	.145*
3. Most popular	.099	.155*		-.424**	.268**	.076
4. Least popular	-.054	-.128*	-.424**		-.328**	.315**
5. Most liked	.055 <sup>a</sup>	.061	.246**	-.350**		-.449**
6. Least liked	.036	-.009	-.047	.417**	-.383**	

Notes: Correlations for males are presented above the diagonal, for females below the diagonal. \*  $p < 0.05$  \*\*  $p < 0.01$ . Superscripts (a) indicate a significant difference between genders.

### Correlation social status and the wish for popularity

To test whether prioritising popularity and the general importance of popularity were positively associated with actual popularity (hypothesis 1), the correlations between these constructs were investigated. Both prioritising popularity and the general importance of popularity were positively, respectively weakly and moderately, associated with most-popular nominations (respectively,  $r = .097$ ,  $p = .041$ , and  $r = .228$ ,  $p < .001$ ), supporting the

hypothesis. Also, using Pearson and Filon's z-calculation (see Pearson and Filon, 1898), we found that the association between the general importance of popularity and most-popular nominations was significantly stronger than the association between most-popular nominations and prioritising popularity ( $p < .001$ ). Whereas prioritising popularity was not associated with least-popular nominations ( $r = -.039, p = .408$ ), the general importance of popularity was correlated negatively with least-popular nominations ( $r = -.154, p = .001$ ). Thus, prioritising popularity and the general importance of popularity were positively associated with actual popularity.

To test whether prioritising popularity and the general importance of popularity were negatively associated with likeability (hypothesis 2), the correlations between these constructs were investigated. Most-liked nominations did not correlate with either prioritising popularity ( $r = .045, p = .345$ ) or the general importance of popularity ( $r = -.006, p = .900$ ), in contrast to hypothesis 2a, but in line with hypothesis 2b. Reversely, there was a positive correlation between prioritising popularity and least-liked nominations ( $r = .142, p = .003$ ). In contrast, the correlation between the general importance of popularity and least-liked nominations was not significant ( $r = .087, p = .063$ ). These results suggest that although prioritising popularity was not associated with being liked, it was associated with being disliked by classmates, thereby offering alternative support for hypothesis 2a, but not for hypothesis 2b.

### **Gender differences**

To investigate whether there were gender differences in prioritising popularity (hypothesis 3a) and in the general importance of popularity (hypothesis 3b), a two-tailed independent samples t-test was conducted. As indicated in table 1, boys prioritised popularity significantly more than girls (boys:  $M = 2.75, SD = .71$ , girls:  $M = 2.61, SD = .72, t(446) =$

2.07,  $p = .039$ ). Furthermore, for boys, popularity was generally more important than for girls (boys:  $M = 3.50$ ,  $SD = 1.61$ , girls:  $M = 3.11$ ,  $SD = 1.58$ ,  $t(446) = 2.60$ ,  $p = .010$ ). Therefore, for boys, the wish to be popular was greater than for girls.

On several occasions, there were significant correlations between the wish for popularity and likeability for one of the genders, whereas they were absent for the other (see table 3). Firstly, the correlation between prioritising popularity and likeability was significantly negative for boys, but absent for girls (boys:  $r = -.152$ ,  $p = .026$ ; girls  $r = .055$ ,  $p = .402$ ). Furthermore, the correlation between prioritising popularity and least-liked nominations was significantly positive, but also only for boys, and not for girls (boys:  $r = .216$ ,  $p < .001$ ; girls:  $r = .036$ ,  $p = .585$ ). Finally, the correlation between the general importance of popularity and least-liked nominations also only held for boys, and not for girls (boys:  $r = .145$ ,  $p = .034$ ; girls:  $r = -.009$ ,  $p = .896$ ), suggesting that the association between the wish for popularity and likeability was different for boys than for girls. Therefore, we investigated whether this was indeed the case using Fisher's  $r$ -to- $z$  transformation (after Fisherman, 1925). The results showed that only the correlation between prioritising popularity and most-liked nominations differed significantly between boys and girls.

To further investigate whether the association between the wish for popularity and popular status was moderated by gender (hypothesis 3, see table 4a), two multiple regression analyses were conducted. In the first analysis, prioritising popularity and gender were included in the first step of the regression (hypothesis 3a). These variables accounted for a small but significant amount of variance in popularity scores,  $R^2 = .03$ ,  $F(2,445) = 6.30$ ,  $p = .002$ . Prioritising popularity was not found to be significantly associated with popular status ( $b = .11$ ,  $t(445) = 1.78$ ,  $p = .076$ ), but gender was ( $b = -.26$ ,  $t(445) = -2.88$ ,  $p = .004$ ). In the second step, an interaction term between prioritising popularity and gender was added, which

did not account for any variance in popularity scores ( $\Delta R^2 = .00$ ,  $\Delta F(1,444) = .00$ ,  $p = .985$ ,  $b = .002$ ,  $t(444) = .018$ ,  $p = .985$ ).

The second multiple-regression analysis was conducted to investigate whether gender moderated the association between the general importance of popularity and popular status (hypothesis 3b, see table 4b). In the first step, the general importance of popularity and gender were included. These variables both accounted for a small but significant amount of variance in popularity scores,  $R^2 = .06$ ,  $F(2,448) = 15.39$ ,  $p < .001$ . The general importance of popularity and gender were both found to be significantly associated with popular status (importance of popularity:  $b = .13$ ,  $t(448) = 4.67$ ,  $p < .001$ , gender:  $b = -.22$ ,  $t(448) = -2.44$ ,  $p = .015$ ). The interaction term added in the second step, between the general importance of popularity and gender, was however not significant ( $\Delta R^2 = .01$ ,  $\Delta F(1,447) = .30$ ,  $p = .082$ ,  $b = -.16$ ,  $t(447) = -1.74$ ,  $p = .082$ ). Thus, gender did not moderate the association between the general importance of popularity and popular status, or the association between prioritising popularity and popular status, for that matter.

**Table 4a**  
*Regression analysis testing for gender as a moderator of the association between prioritising popularity and popular status.*

Step		B	SE	F	R <sup>2</sup>	ΔR <sup>2</sup>
1				6.30	.03	
	Prioritising popularity	.11	.06			
	Gender	-.26**	.09			
2				6.30	.03	.00
	Prioritising popularity x Gender	.002	.09			

*Dependent variable: popularity; B, unstandardised beta; SE, standard error; F, F statistic; R<sup>2</sup>, variance; ΔR<sup>2</sup>, change in variance. \*  $p < .05$ , \*\*  $p < .01$ .*

**Table 4b**

*Regression analysis testing for gender as a moderator of the association between the general importance of popularity with popular status.*

Step		B	SE	F	R <sup>2</sup>	ΔR <sup>2</sup>
1				15.39	.06	
	Importance of popularity	.13**	.03			
	Gender	.22*	.09			
2				15.69	.07	.01
	Importance of popularity x Gender	-.16	-.12			

*Dependent variable: popularity; B, unstandardised beta; SE, standard error; F, F statistic; R<sup>2</sup>, variance; ΔR<sup>2</sup>, change in variance. \*  $p < .05$ , \*\*  $p < .01$ .*

### **Interaction of the wish for popularity with likeability**

To investigate whether the association between prioritising popularity and popular status was moderated by likeability (hypothesis 4a), another multiple regression analysis was conducted. In the first step, prioritising popularity and likeability (most-liked nominations) were included, which accounted for a small but significant amount of variance in popularity scores,  $R^2 = .08$ ,  $F(2,445) = 20.36$ ,  $p < .001$ . Prioritising popularity and likeability were both significantly associated with popular status (prioritising popularity:  $b = .15$ ,  $t(445) = 2.40$ ,  $p = .017$ , likeability:  $b = .27$ ,  $t(445) = 6.01$ ,  $p < .001$ ). Thus, popular children appear to sometimes be liked as well. Also, either popular children prioritise popularity to a great extent, or prioritising popularity increases popularity. In the second step of the regression, an interaction term between prioritising popularity and likeability was added, which did not account for a significant proportion of the variance in popularity scores,  $\Delta R^2 = .01$ ,  $\Delta F(1,444) = 2.76$ ,  $p = .097$ ,  $b = -.074$ ,  $t(444) = -1.66$ ,  $p = .097$ , see table 5a. Thus, likeability did not moderate the association between prioritising popularity and popular status and hypothesis 4a was rejected.

To investigate whether the association between the general importance of popularity and popular status was moderated by likeability (hypothesis 4b), another multiple regression analysis was conducted. In the first step, the general importance of popularity and likeability

were included. These variables accounted for a significant amount of variance in popularity scores,  $R^2 = .12$ ,  $F(2,448) = 30.88$ ,  $p < .001$ . The general importance of popularity and likeability were both significantly associated with popular status (general importance of popularity:  $b = .14$ ,  $t(448) = 5.18$ ,  $p < .001$ , likeability:  $b = .26$ ,  $t(448) = 5.94$ ,  $p < .001$ ), see table 5b, thus suggesting that either popular children generally value their popularity, or that finding popularity generally important can indeed increase popularity. In the second step, an interaction term between the general importance of popularity and likeability was added, which accounted for a significant proportion of the variance in popularity scores,  $\Delta R^2 = .01$ ,  $\Delta F(1,447) = 5.41$ ,  $p = .021$ ,  $b = .11$ ,  $t(447) = 2.33$ ,  $p = .021$ . Thus, the association between the general importance of popularity and actual popularity depended on the level of one's likeability.

**Table 5a**  
*Regression analysis testing for likeability as a moderator of the association between prioritising popularity with popular status.*

Step		B	SE	F	R <sup>2</sup>	ΔR <sup>2</sup>
1				20.36	.08	
	Prioritising popularity	.15*	.06			
	Likeability	.27**	.05			
2				23.12	.09	.01
	Prioritising popularity x Likeability	-.07	.04			

*Dependent variable: popularity; B, unstandardised beta; SE, standard error; F, F statistic; R<sup>2</sup>, variance; ΔR<sup>2</sup>, change in variance. \*  $p < .05$ , \*\*  $p < .01$ .*

**Table 5b**  
*Regression analysis testing for likeability as a moderator of the association between the general importance of popularity with popular status.*

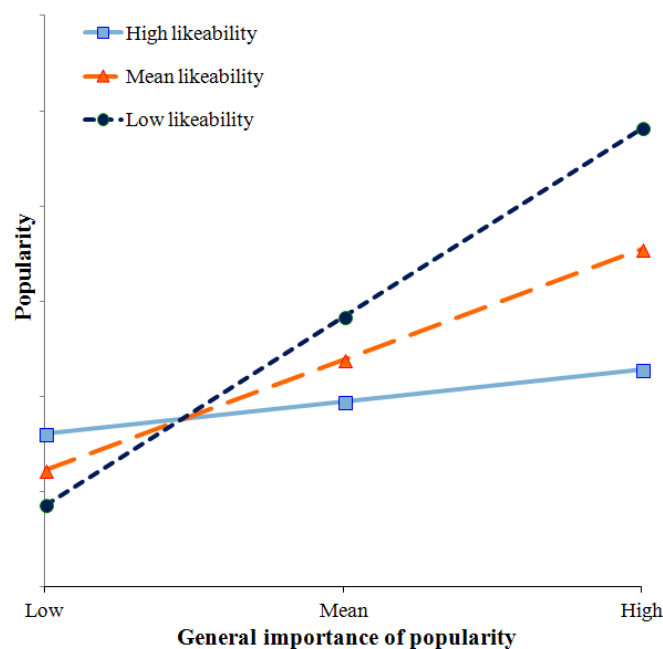
Step		B	SE	F	R <sup>2</sup>	ΔR <sup>2</sup>
1				30.88	.12	
	Importance of popularity	.14**	.03			
	Likeability	.26**	.04			
2				36.29	.13	.01
	Importance of popularity x Likeability	-.11*	.05			

*Dependent variable: popularity; B, unstandardised beta; SE, standard error; F, F statistic; R<sup>2</sup>, variance; ΔR<sup>2</sup>, change in variance. \*  $p < .05$ , \*\*  $p < .01$ .*

The two-way interaction between the general importance of popularity and likeability is plotted in figure 1. The association between popularity and general importance of popularity is plotted for participants who were relatively unliked (-1 SD), averagely liked (mean likeability score) and relatively well-liked (+1 SD). The figure shows that the association between popularity and the general importance of popularity was stronger for less liked rather than well-liked participants. Thus, hypothesis 4b was supported

**Figure 1**

*Plot of the interaction between the general importance of popularity and popular status, for children who scored low on likeability (-1 SD), had a mean score for likeability (mean) and who scored high on likeability (+1 SD)*



**Interaction of prioritising popularity and the general importance of popularity**

The last multiple regression was conducted to test whether prioritising popularity and the general importance of popularity interacted in predicting popular status (hypothesis 5). Firstly, prioritising popularity and the general importance of popularity were included, which accounted for a small but significant amount of variance in popularity scores,  $R^2 = .06$ ,



$F(2,445) = 13.64, p < .001$ . Prioritising popularity was not significantly associated with popular status ( $b = .06, t(445) = 1.02, p = .310$ ), but the general importance of popularity was ( $b = .14, t(445) = 4.78, p < .001$ ), see table 6. The interaction term between prioritising popularity and the general importance of popularity added in the second step did not account for any significant proportion of the variance in popularity scores,  $\Delta R^2 = .00, \Delta F(1,444) = .021, p = .884, b = -.006, t(444) = -.15, p = .884$ . Thus, there was a main effect of the general importance of popularity on popularity, but not of prioritising popularity. Also, prioritising popularity and the general importance of popularity did not interact in predicting popular status, and therefore, hypothesis 5 was rejected.

**Table 6**

*Regression analysis testing for an interaction between the general importance and prioritising popularity in predicting popular status.*

Step		B	SE	F	R <sup>2</sup>	$\Delta R^2$
1				13.64	.06	
	Prioritising popularity	.06	.06			
	Importance of popularity	.14**	.03			
2				13.66	.06	.00
	Prioritising popularity x Importance of popularity	-.006	.045			

*Dependent variable: popularity; B, unstandardised beta; SE, standard error; F, F statistic; R<sup>2</sup>, variance;  $\Delta R^2$ , change in variance. \*  $p < .05$ , \*\*  $p < .01$ .*

## **Discussion**

This study focused on the association of the wish for popularity with social status among children at the end of primary school. The results indicated that the wish to be popular was positively associated with popularity, and that prioritising popularity was associated with being more disliked, especially among boys. Also, the association between the general importance of popularity and actual popular status was stronger for children who were less liked, rather than more liked. Therefore, two measures of the wish to be popular, namely prioritising popularity and a general measure of the importance of popularity, can already be distinguished in late childhood. Further research might indicate whether children's behaviours coincide with these results.

### **Discussion of the results**

Older children might have two distinct ways of gaining and maintaining social status: for popularity, the associations with the two different measures of the wish for popularity were found to be similar, whereas for likeability, they differed from one another. In line with our expectations, prioritising popularity and the general importance of popularity were both positively associated with actual popularity (hypothesis 1). This finding is in line with previous research indicating that social status can be influenced by how important one deems popularity (Rodkin et al., 2013; Cillessen et al., 2014), and adds to it by showing that this association already exists in late childhood. It appeared that, even though the general importance of popularity and prioritising popularity were both associated with popular status, the association between the general importance of popularity and popular status was stronger. One possibility is that not all children have to give up other social domains, such as friendship, in order to be popular. Another explanation could be that children who are popular do feel a general need to stay popular, but they do not feel the need to give up other social

domains as much, since they are already popular. A longitudinal study might reveal if either of the explanations hold, by investigating the association between the wish for popularity and popular status in children who started out as being non-popular and became more popular over time.

Whereas prioritising popularity and the general importance of popularity were similarly associated with popular status, they were differently associated with likeability (hypothesis 2). This indicates that the two constructs of the wish for popularity can be distinguished in older children. Prioritising popularity was not associated with being liked, but it was associated with being disliked (hypothesis 2a), suggesting that, in line with our expectations, children who prioritise popularity more are sometimes more *disliked*. Previous research already indicated that the balance between prioritising popularity and being liked can be difficult (Dijkstra et al., 2010; De Bruyn & Van den Boom, 2005). When a child prioritises popularity, it will have to give up other social domains, such as being liked (LaFontana & Cillessen, 2010). Following our results, it might even be the case that prioritising popularity not only reduces likeability, but it actively increases being disliked. In prioritising popularity over other domains such as likeability, one might be more willing to adopt certain strategies in pursuing popularity; strategies that might consist of disruptive behaviours, that in turn threaten likeability. Thus, the more one prioritises popularity, the more one might be willing to be less liked.

Even though prioritising popularity was associated with being more disliked, there was no interaction between prioritising popularity and likeability in predicting popular status, rejecting hypothesis 4a. The above mentioned association between prioritising popularity and being disliked by peers can offer an explanation for this result. Given that a well-liked child already acquired a high social status through likeability, it seems understandable that he or she is not willing to give up this status for potential popularity. Therefore, well-liked children

are not expected to prioritise popularity to a great extent, because, as noted, this will probably affect their likeable status negatively. On the other hand, children who are not liked have no social status to lose by prioritising it and are therefore expected to prioritise popularity to a greater extent than children who are well-liked.

Whereas prioritising popularity was associated with being disliked, the general importance of popularity was not associated with likeability, supporting hypothesis 2b. Thus, for children who find popularity generally more important than peers, keeping the balance with likeability appears to be easier. This might be because generally deeming popularity important does not entail the preferring of popularity over any other domain of social status, like prioritising popularity does (LaFontana and Cillessen, 2010), thus not threatening likeability. Moreover, likeability moderated the association between the general importance of popularity and popularity (hypothesis 4b), where the association between finding popularity generally important and actual popular status was stronger for less liked children than for well-liked children. Firstly, these differences might exist because well-liked children are to some degree already popular. Reversely, less liked children are often not necessarily popular. Therefore, the extent to which less liked children find popularity important might have a larger impact on their popular status. Secondly, the general importance of popularity was not associated with likeability, and thus, children can apparently simultaneously be well-liked and find popularity important, but can also be well-liked and not find popularity important, therefore enabling an interaction.

In contrast to our expectations, we did not find an interaction between prioritising popularity and the general importance of popularity in predicting popularity (hypothesis 5), suggesting that finding popularity generally important can be associated with popularity, regardless of the willingness to give up other social domains for it. It seems straightforward to suggest that prioritising popularity and the general importance of popularity would overlap

to a certain extent, because they are in essence very similar; prioritising popularity only takes the wish for popularity one step further. Following this line of reasoning, we expected that the association between prioritising popularity and popular status would be stronger for those who deemed popularity generally important and weaker for those who did not. This hypothesis was however rejected by the lack of an interaction, suggesting that both measures had their own, independent influence on popular status.

Concerning gender (hypothesis 3), there were some differences in the wish for popularity between boys and girls. Boys prioritised popularity more than did girls and also found it generally more important, thereby replicating LaFontana and Cillessen (2010) and Cillessen et al. (2014). Also, for boys, the wish to be popular was associated with being less liked by peers, but this association did not exist for girls. In explaining this difference, popular boys might more often display negative behaviours than popular girls, which in turn decreases their likeability. Cillessen et al. (2014) indeed found that the antisocial behaviours accompanying popularity were stronger in adolescents who prioritised popularity more, and especially in boys. LaFontana and Cillessen (2010) proposed that boys might be less concerned about how their behaviours influence their social relationships, or maybe that boys are just not as good at balancing social status priorities as are girls. Even though we found that boys prioritised popularity to a greater extent than girls and deemed popularity more important in general, gender did not moderate the relation between the wish for popularity and actual popular status. This suggests that the differences between boys and girls in the associations between the wish for popularity and popular status are not dependent on gender itself.

Since our design is cross-sectional, no causal conclusions can be drawn. It is, however, possible to speculate on the directions of the associations. On the one hand, we presume that it is likely that the measures for the wish for popularity mainly have a positive

effect on popular status. As Rodkin et al. (2013) have found, third graders who indicated that popularity was important to them became more popular two years later, thus indicating that finding popularity important can influence popular status positively. Also, since prioritising popularity entails a “compromise [of] other priorities in favor of status [i.e., popularity]” (LaFontana & Cillessen, 2010, p.140), prioritising popularity is likely to cause a decrease in likeability. On the other hand, social status could have its own effect on the wish for popularity. Having a high social status is important to young individuals (Dijkstra et al., 2010) and thus, when a child is neither liked nor popular, it does not have a high social status. Therefore, it presumably wants to gain one and this might stimulate the dire wish to be popular. Further research will have to point out if these suggestions are accurate.

### **Implications**

This study offers insights in the development of the peer system of older children and in the driving forces behind it. Children at the end of primary school are apparently already willing to give up other social domains in order to be popular, indicating that in this age group, prioritising popularity can be distinguished from a general importance of popularity. Whereas prioritising popularity entails a giving up of social domains other than popularity in order to be popular, the general importance of popularity does not entail that. This study shows that at least some features about the wish for popularity in young adolescents also apply to children.

The insights in this study can be useful in studying peer group constructions inside the classroom and in extrapolating therefrom the reasons why certain children behave the way they do. For example, popular individuals have a large influence on group dynamics and can thus feel the need to remain at the top of the hierarchy (Mayeux, Sandstrom & Cillessen, 2008). When teachers better understand their pupils’ status motivations and possibly the

reason why popular children behave the way they do, they can deal with it accordingly and thus intervene appropriately.

Additionally, the study showed that a subgroup of children exists who find popularity generally important, but who are not less liked for it. Since children in this group seem to be able to balance popularity, the wish to be popular, and likeability, future research might further study them. For example, studying the strategies these children use in consciously or unconsciously balancing popularity and likeability, children could be made aware of the consequences of prioritising popularity. Furthermore, they could be taught ways in which they can better balance the two.

The findings of this study further contribute to the artificial intelligence field of social computing. The study might be useful in creating “intelligent entities that can interact with human users” (Wang et al., 2007, p.80). A good example of an interaction involving these intelligent entities is serious gaming, where characters should possess human-like social intelligence and exhibit social behaviour convincingly, while adapting to the social environment of the game (Wang et al., 2007). For children to appreciate such characters in a digital world, it is important that they attribute a positive social status to them. The results of this study indicate that, rather than prioritising popularity over other domains, such intelligent entities should focus on obtaining and maintaining popularity without losing sight of other domains in order to obtain the best balance between the wish to be popular and social status. Alternatively, serious games can be developed for children to practice balancing the ‘need to belong’ with the need to be popular. Such serious games may teach children the, to them possibly unknown, costs of prioritising popularity over other domains. When children experience in a virtual environment how prioritising popularity can lead to the loss of being liked, it may prevent them from being less liked in real life because they prioritise popularity to a great extent.

### **Strengths**

The way in which this study was carried out had some advantages over previous research in the field. Previous studies either only investigated social status (e.g., Van den Berg et al., 2015; Shoulberg, Sijtsema & Murray-Close, 2011; Van den Broek et al., 2015), the wish to be popular without measures of social status (LaFontana & Cillessen, 2010), or only the association between the wish for popularity and social status among adolescents (Cillessen et al., 2014). This study builds on those studies by simultaneously assessing prioritising popularity, the general wish to be popular, and actual social status in late childhood. Using this unique design and a large sample of children, several innovative findings emerged.

Many previous studies used a difference score subtracting the mean of most-liked and least-liked nominations as a measure for likeability. When doing this, it is possible that someone who is highly liked by some and highly disliked by just as many, will have the same likeability score as someone who received no nominations for either liked or disliked (see also Dishion, 2013). In this study, most-liked and least-liked nominations were not averaged but treated as two separate measures. Therefore, we were able to demonstrate that sometimes most-liked nominations were differently associated with the wish for popularity than least-liked nominations, which cannot be demonstrated when taking them together in one likeability score. Thus, these constructs can be investigated separately just as well as taken together in one likeability score.

### **Limitations and further research**

When interpreting the results of this study, there are some important points to take into consideration. Firstly, almost all associations found in this study had a relatively small effect size. It is possible that these were caused by the heterogeneity of the sample. All



children develop at their own pace, which makes it likely that there is a lot of individual variation between the children, especially in late childhood. Also, children in late childhood might not show a general trend, but differ drastically individually in status motivations. Since social status is largely a group construct, children who grow up in different social environments might behave very differently depending on the nature of that environment. Altogether, this may have caused the small effect sizes that we found, limiting the conclusions we can draw from them. Even so, the associations were generally in line with the existing literature, adding to their credibility.

Secondly, the study used a self-reported questionnaire which brings the risk of participants filling in socially desirable answers. To limit this social desirability, the participants were informed that the answers they gave would be processed anonymously. Also, peer reports as well as self-reports were used to prevent socially desirable answers and enable comparisons of the constructs from two different perspectives. Additionally, participants were asked how they would respond in a certain situation. Ideally, it could be investigated to what extent answers given by participants coincide with actual behaviour (see for further discussion LaFontana & Cillessen, 2010). For further research, we therefore suggest using multiple sources of information and to use real-life scenarios, to compare them with the answers given in the prioritising popularity questionnaire. This way, future studies could also investigate whether children in late childhood display the comparable negative behaviours to those of popular adolescents (LaFontana & Cillessen, 2010; Moffitt, 1993; De Bruyn, Cillessen & Wissink., 2009; Dijkstra, Lindenberg & Veenstra, 2008) and whether the wish to be popular influences this behaviour.

Thirdly, as the data was cross-sectional, causality could not be studied. Theoretically, it is just as possible that being popular makes one prioritise popularity more, as it is that prioritising popularity more, makes one more popular, not to mention other factors that could

be involved. We already speculated about our expectations concerning causality in a previous section. To shed some more light on the direction of the associations, future research could use a longitudinal research design, in order to investigate causal relations between social status and the wish for popularity.

In sum, our study showed that popularity and likeability are already different constructs at the end of primary school. Children around the age of ten additionally seem to differentiate between prioritising popularity and finding popularity generally important. Moreover, children who wanted to be popular were more likely to actually be more popular, and were also more likely to be disliked by peers as opposed to children who did not. Furthermore, the general importance of popularity was more related to popularity for less liked children than for well-liked children. The study adds to existing literature on popularity, likeability, and prioritising popularity, by investigating known associations from adolescence in late childhood. The results provide a solid base for the development of artificial intelligence in serious gaming, which might benefit children who have difficulties with balancing prioritising popularity with other social domains.

### References

- Agan, M. L., Costin, A. S., Deutz, M. H., Edelsbrunner, P. A., Záliš, L., & Franken, A. (2015). Associations between risk behaviour and social status in European adolescents. *European Journal of Developmental Psychology, 12*(2), 189-203. doi: 10.1080/17405629.2014.975790.
- Cillessen, A. H., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between aggression and social status. *Child development, 75*(1), 147-163. doi: 10.1111/j.1467-8624.2004.00660.x.
- Cillessen, A. H., Mayeux, L., Ha, T., de Bruyn, E. H., & LaFontana, K. M. (2014). Aggressive effects of prioritizing popularity in early adolescence. *Aggressive behavior, 40*(3), 204-213. doi: 10.1002/ab.21518.
- Cillessen, A. H., & Rose, A. J. (2005). Understanding popularity in the peer system. *Current Directions in Psychological Science, 14*(2), 102-105. doi: 10.1111/j.0963-7214.2005.00343.x.
- Cohen, L.H. (1988). Measurement of life events. In: Cohen L.H. (ed.). *Life Events and Psychological Functioning: Theoretical and Methodological Issues*. Sage: Newbury Park, California (pp. 11–30).
- De Bruyn, E. H., Cillessen, A. H., & Wissink, I. B. (2009). Associations of peer acceptance and perceived popularity with bullying and victimization in early adolescence. *The Journal of Early Adolescence*. doi: 10.1177/0272431609340517.
- De Bruyn, E. H., & Van den Boom, D. C. (2005). Interpersonal Behavior, Peer Popularity, and Self-esteem in Early Adolescence. *Social development, 14*(4), 555-573. doi: 10.1111/j.1467-9507.2005.00317.x.

- Dijkstra, J. K., Cillessen, A. H., Lindenberg, S., & Veenstra, R. (2010). Basking in reflected glory and its limits: Why adolescents hang out with popular peers. *Journal of Research on Adolescence*, 20(4), 942-958. doi: 10.1111/j.1532-7795.2010.00671.x.
- Dijkstra, J. K., Lindenberg, S., & Veenstra, R. (2008). Beyond the class norm: Bullying behavior of popular adolescents and its relation to peer acceptance and rejection. *Journal of abnormal child psychology*, 36(8), 1289-1299. doi: 10.1007/s10802-008-9251-7.
- Dishion, T. J. (2013). Stochastic Agent-Based Modeling of Influence and Selection in Adolescence: Current Status and Future Directions in Understanding the Dynamics of Peer Contagion. *Journal of Research on Adolescence*, 23(3), 596–603. doi:10.1111/jora.12068.
- Fisher, R.A. (1925). *Statistical Methods for Research Workers*. Edinburgh: Oliver and Boyd. ISBN 0-05-002170-2.
- Fiske, S. T. (2004). *Social beings: A core motives approach to social psychology*. New York: Wiley.
- Hawley, P. H. (2003). Prosocial and coercive configurations of resource control in early adolescence: A case for the well-adapted Machiavellian. *Merrill-Palmer Quarterly*, 49(3), 279-309.
- LaFontana, K. M., & Cillessen, A. H. (1998). The nature of children's stereotypes of popularity. *Social Development*, 7(3), 301-320. doi: 10.1111/1467-9507.00069.
- LaFontana, K. M., & Cillessen, A. H. (2010). Developmental changes in the priority of perceived status in childhood and adolescence. *Social Development*, 19(1), 130-147. doi: 10.1111/j.1467-9507.2008.00522.x.
- Lease, A. M., Kennedy, C. A., & Axelrod, J. L. (2002). Children's social constructions of popularity. *Social development*, 11(1), 87-109. doi: 10.1111/1467-9507.00188.

- Mayeux, L., Sandstrom, M. J., & Cillessen, A. H. (2008). Is being popular a risky proposition?. *Journal of Research on Adolescence*, *18*(1), 49-74. doi: 10.1111/j.1532-7795.2008.00550.
- Merten, D. E. (1997). The meaning of meanness: Popularity, competition, and conflict among junior high school girls. *Sociology of Education*, 175-191. doi: 10.2307/2673207.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psychological review*, *100*(4), 674-701.  
<http://dx.doi.org/10.1037/0033-295X.100.4.674>.
- Nangle, D. W., Erdley, C. A., & Gold, J. A. (1996). A reflection on the popularity construct: The importance of who likes or dislikes a child. *Behavior Therapy*, *27*(3), 337-352. doi: 10.1016/S0005-7894(96)80021-9.
- Oldehinkel, A. J., Rosmalen, J. G., Veenstra, R., Dijkstra, J. K., & Ormel, J. (2007). Being admired or being liked: Classroom social status and depressive problems in early adolescent girls and boys. *Journal of abnormal child psychology*, *35*(3), 417-427. doi: 10.1007/s10802-007-9100-0.
- Parkhurst, J. T., & Hopmeyer, A. (1998). Sociometric popularity and peer-perceived popularity two distinct dimensions of peer status. *The Journal of Early Adolescence*, *18*(2), 125-144. doi: 10.1177/0272431698018002001.
- Pearson, K., & Filon, L. N. G. (1898). Mathematical contributions to the theory of evolution. IV. On the probable errors of frequency constants and on the influence of random selection on variation and correlation. *Philosophical Transactions of the Royal Society of London. Series A, Containing Papers of a Mathematical or Physical Character*, *191*, 229-311.

- Puckett, M. B., Aikins, J. W., & Cillessen, A. H. (2008). Moderators of the association between relational aggression and perceived popularity. *Aggressive Behavior, 34*(6), 563-576. doi: 10.1002/ab.20280.
- Rodkin, P. C., Ryan, A. M., Jamison, R., & Wilson, T. (2013). Social goals, social behavior, and social status in middle childhood. *Developmental Psychology, 49*(6), 1139-1150. doi: 10.1037/a0029389.
- Rose, A. J., Swenson, L. P., & Waller, E. M. (2004). Overt and relational aggression and perceived popularity: developmental differences in concurrent and prospective relations. *Developmental psychology, 40*(3), 378-387. <http://dx.doi.org/10.1037/0012-1649.40.3.378>.
- Sandstrom, M. J., & Cillessen, A. H. (2006). Likeable versus popular: Distinct implications for adolescent adjustment. *International Journal of Behavioral Development, 30*(4), 305-314. doi: 10.1177/0165025406072789.
- Shoulberg, E. K., Sijtsema, J. J., & Murray-Close, D. (2011). The association between valuing popularity and relational aggression: The moderating effects of actual popularity and physiological reactivity to exclusion. *Journal of experimental child psychology, 110*(1), 20-37. doi: 10.1016/j.jecp.2011.03.008.
- Van den Berg, Y. H., Burk, W. J., & Cillessen, A. H. (2015). Identifying subtypes of peer status by combining popularity and preference a cohort-sequential approach. *The Journal of Early Adolescence, 35*(8), 1108-1137. doi: 10.1177/0272431614554704.
- Van den Broek, N., Deutz, M. H., Schoneveld, E. A., Burk, W. J., & Cillessen, A. H. (2015). Behavioral correlates of prioritizing popularity in adolescence. *Journal of youth and adolescence, 1*-11. doi: 10.1007/s10964-015-0352-7.
- Van der Linden, D., Scholte, R. H., Cillessen, A. H., te Nijenhuis, J., & Segers, E. (2010). Classroom ratings of likeability and popularity are related to the Big Five and the

general factor of personality. *Journal of Research in Personality*, 44(5), 669-672. doi: 10.1016/j.jrp.2010.08.007.

Wang, F. Y., Carley, K. M., Zeng, D., & Mao, W. (2007). Social computing: From social informatics to social intelligence. *IEEE Intelligent Systems*, 22(2), 79-83. doi: 10.1109/MIS.2007.41.