Risk Factor Popularity and Risk Buffer Likeability Combined in Predicting Adolescent Aggression: The Interactions with Educational Level and Sex

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Abstract

Aggressive behavior is intentional behavior to harm another person, and can lead to negative outcomes for the perpetrator and the victim. In order to effectively reduce aggression, factors that could influence aggression, such as social status, should be investigated. This study examines if different social status groups, based on popularity and likeability combined, are related to aggression, and whether adolescents in higher educational levels and boys show more aggression within these groups. Longitudinal data of the Social Network Analysis of Risk behavior in Early adolescence (SNARE) project are used. Data on popularity, likeability, and aggression were collected through peer-nominations, using a questionnaire ($N = 1785$). The results of a multiple regression analysis implied that being popular, whether or not the adolescent was likeable, acted as a risk factor in predicting more aggression. Furthermore, likeability acted as a small risk buffer in neutralizing some of the effects of popularity on aggression. Lastly, neither educational level nor sex moderated all relations between social status and aggression. Future research should aim to uncover the reasons why adolescents are prone to use aggression to attain a popular status, in order to effectively reduce aggression and negative outcomes in the future.

Keywords: popularity, likeability, aggression, adolescents

Samenvatting

Agressief gedrag is opzettelijk gedrag om iemand pijn te doen en kan leiden tot negatieve gevolgen voor de dader en het slachtoffer. Om het gebruik van agressie effectief te kunnen reduceren, moeten de factoren die agressie kunnen beïnvloeden, onderzocht worden. Deze studie onderzoekt of verschillende sociale statussen, gebaseerd op populariteit en aardigheid gecombineerd, agressie voorspellen en of adolescenten in hogere opleidingsniveaus en jongens meer agressie vertonen binnen deze groepen. Longitudinale data van het Social Network Analysis of Risk behavior in Early adolescence (SNARE) project zijn gebruikt. Data over populariteit, aardigheid en agressie zijn verzameld via peernominaties ($N = 1785$). De resultaten van een multipele regressie analyse suggereren dat hoge populariteit, al dan niet gecombineerd met hoge aardigheid, functioneerde als een risicofactor in het voorspellen van agressie. Daarnaast functioneerde aardigheid als een kleine risicobuffer voor het neutraliseren van een deel van het effect van populariteit op agressie. Als laatste modereerde noch opleidingsniveau, noch geslacht alle relaties tussen sociale status en agressie. Toekomstig onderzoek zou zich moeten richten op het blootleggen van redenen waarom adolescenten regelmatig agressie gebruiken voor een populaire status, om op deze manier interventies te kunnen ontwerpen, die agressie en bijbehorende negatieve uitkomsten in de toekomst effectief kunnen verminderen.

Kernwoorden: populariteit, aardigheid, agressie, adolescenten

Introduction

Aggressive behavior is intentional behavior to harm another person, such as physical harm, hurting feelings, or damaging social relationships (Allen & Anderson, 2017). This behavior can lead to various negative outcomes for both the victim and the perpetrator, like poor peer relationships, academic problems, delinquency, substance use, anxiety, and depression (Loeber, 1990; Pederson, Fite, & Bortolato, 2018; Wolke, Copeland, Angold, & Costello, 2013). According to Moffitt (1993), antisocial behavior, such as aggression, is heightened in adolescence. To reduce aggression and consequent negative outcomes, it is important to gain knowledge of what factors possibly predict aggression in adolescence. One such factor can be social status, which becomes increasingly important in adolescence (Salmivalli, 2010). Social status can depend, among others, on two factors: popularity and likeability (Parkhurst & Hopmeyer, 1998). Popularity (being perceived as popular by peers) and likeability (being liked by peers) are both associated with having friends, but differ from each other in other aspects (Sandstrom & Cillessen, 2006). Likeability is related positively to prosocial behaviors, such as inclusion of others and being helpful, whereas popular adolescents generally show more antisocial behaviors, such as aggression and manipulation. As popularity and likeability are distinct domains (Parkhurst & Hopmeyer, 1998), people can attain different social statuses based on popularity in combination with likeability. Because popularity is positively related to aggression, while likeability is negatively related to aggression (Cillessen & Mayeux, 2004a), it would be especially interesting to gain knowledge about adolescents who are both popular and likeable, or both not popular and not likeable. If for example both popularity and likeability are high, would the prosocial tendencies associated with likeability neutralize the aggressive tendencies of popularity? This will be examined in the current study. Furthermore, the visibility of aggression can differ across educational levels (Garandeau, Ahn, & Rodkin, 2011; Jonkmann, Trautwein, & Lüdtke, 2009). Because students in higher educational levels are generally less disruptive than students in lower educational levels (Van Wonderen, 2005), extremely visible behavior such as aggression is accentuated by the calmness in the higher educational levels, possibly creating an extra 'cool' value to aggression. Therefore, educational level could function as a moderator on the relation between social status and aggression. Finally, Sandstrom and Cillessen (2006) suggest that boys value popularity more than girls; the latter often refrain from using aggression out of fear of losing friends, while boys do not fear this consequence as much. Thus, sex could moderate the relation between social status and aggression as well. In sum, it is expected that social statuses, based on a combination

of popularity and likeability, predict aggression and that educational level and sex could moderate these effects.

The influence of social status on aggression

Many studies have examined the relations between popularity, likeability, and aggression using a variable-centered approach. For example, Cillessen and Mayeux (2004a) followed 905 adolescents from grade 5 up to grade 10, analyzing how popularity and likeability, and relational- and physical aggression were related to each other. They concluded that being popular predicted more aggression than not being popular, and being liked predicted less aggression than not being liked; these results have been found in other studies as well (LaFontana & Cillessen, 2002; Prinstein & Cillessen, 2003; Rose, Swenson, & Walker, 2004). However, these studies do not examine how aggression is influenced if popularity and likeability are combined. By examining these factors within individuals, combining their scores on popularity and aggression, an extra dimension can be given to the results.

Lease, Kennedy, and Axelrod (2002), and Parkhurst and Hopmeyer (1998) used such person-centered approach by calculating the scores on popularity and likeability for all participants in their research and creating four groups, using the combined score on popularity and likeability. Based on peer-nomination data of 727 participants, Parkhurst and Hopmeyer (1998) categorized 70 participants as low popularity and high likeability (LP/HL), 85 as high popularity and low likeability (HP/LL), 39 as high popularity and high likeability (HP/HL), and 71 as average on popularity and likeability. No group was distinguished as low popularity and low likeability (LP/LL), and unfortunately, many participants that did not fit into any group were excluded, losing a lot of potentially interesting data. However, the results are still interesting and relevant for the current study, as it reveals that LP/HL participants were perceived by peers to show the least aggression of all groups. This result was replicated by Lease and colleagues (2002), using the same group distinction but with elementary school participants. LP/HL people are characterized as kind, trustworthy, and non-aggressive (Parkhurst & Hopmeyer, 1998) and show a prosocial behavior pattern (Sandstrom & Cillessen, 2006). The combination of prosocial characteristics of HL and low aggressive tendencies of LP (Cillessen & Mayeux, 2004a; Sandstrom & Cillessen, 2006), indicate that LP/HL adolescents aggress least often of all social status groups. Thus, it is expected that the result of LP/HL adolescents aggressing the least of all groups will be replicated in the current study.

As Sandstrom and Cillessen (2006) suggest, adolescents who are the most likeable and most popular combined (HP/HL), are the adolescents who show both prosocial and aggressive

behavior. These 'bi-strategic adolescents' have as many friendships as adolescents who are average on both popularity and likeability, but are more often nominated as 'best friend', have more conflicts, and show higher levels of aggression (Hawley, 2007). They use both coercive and prosocial strategies in order to attain a certain goal, such as social status within a peer group. It is possible they show aggression in order to be socially visible and enhance their popularity (Andreou, 2006; LaFontana & Cillessen, 2002; Lease et al., 2002), and show prosocial behavior in order to successfully persevere their popularity and the corresponding aggression. Based on these findings, it is expected in the current study that HP/HL adolescents tend to show more aggression than LP/HL adolescents.

In contrast, adolescents who score low on likeability tend to be more aggressive than those high on likeability, whether or not they are popular (e.g. Cillessen & Mayeux, 2004a). Consequently, studies found that HP/LL adolescents score significantly higher on aggressive behaviors than LP/HL adolescents and HP/HL adolescents (Lease et al., 2002; Parkhurst & Hopmeyer, 1998). This high score on aggression could be the consequence of HP/LL adolescents realizing their popularity can be maintained by using coercive strategies (Estell, Farmer, Pearl, Van Acker, & Rodkin, 2003; Haywel, 2007). Perhaps aggression is shown when a peer threatens the social position of the popular adolescent, who hopes to secure this popular position by intimidating the threatening peer (Cillessen & Mayeux, 2004a). Moreover, aggression is perceived as 'cool' and 'popular' behavior by peers, creating a popularity-enhancing value to this behavior (Salmivalli, 2010). Combining the tendency of being aggressive of HP with the absent prosocial behaviors of LL, leads to the hypothesis in the current study that HP/LL adolescents show the most aggression of all groups. Additionally, it is expected to replicate the finding that HP/HL adolescents show somewhat less aggression than HP/LL, as the latter does not have the high likeability to potentially act as a risk buffer to somewhat neutralize the positive effect of popularity on aggression (Lease et al., 2002; Parkhurst & Hopmeyer, 1998).

LP/LL adolescents have not been studied widely in person-centered studies yet (Lease et al., 2002; Parkhurst & Hopmeyer, 1998). However, Prinstein and Cillessen (2003) found that adolescents with low likeability, while being unpopular, showed high levels of aggression, similar to HP/LL adolescents. These high levels of aggression of LP/LL could be explained by the theory of belongingness of Baumeister and Leary (1995). Everyone has a need to belong to a group of people to feel socially satisfied. LP/LL adolescents do not have many (strong) bonds and can therefore feel like this need is not satisfied. To increase their popularity, they can show more aggression in presence of peers, to radiate social power (e.g. Cillessen & Mayeux, 2004a).

Furthermore, as stated before, adolescents with low likeability generally tend to show more aggression than those high on likeability, independent of their popularity (Cillessen & Mayeux, 2004a). Thus, it is hypothesized in this study that LP/LL will show more aggression than LP/HL adolescents.

The moderating influence of educational level and sex

Educational level might influence the relations between social status and aggression (Garandeau et al., 2011; Jonkmann et al., 2009). The positive link between popularity and aggression, and the negative link between likeability and aggression, found by using data of respectively 789 children and 5468 adolescents, both seemed stronger in classrooms with little disruption. According to Van Wonderen (2004), these are primarily the classrooms with higher educational levels. An explanation of this interaction could be that visible behavior, such as aggression, is more accentuated in the calmer environment of higher educational levels, than in the more disruptive environments of lower educational levels (Van Wonderen, 2004). As Lease and colleagues (2002) explain, social visibility is fundamental to achieve and maintain popularity. Following this line of thinking, it is possible that adolescents who strive for more popularity (so, all groups except LP/HL) are perceived by peers to show somewhat more aggression in higher educational levels than in lower educational levels, because aggressive behavior is more visible in higher educational levels, and can consequently enhance popularity. In the current study, it is therefore expected that adolescents of all social status groups are perceived to show more aggression in higher educational levels than in lower educational levels.

Baumeister and Sommer (1997) suggest that boys show relatively more aggression than girls to achieve and/or maintain popularity, because boys value this status more than girls. They state that boys generally seek for more connections with multiple people in order to earn more popularity, whereas girls attach more importance to closer relations with more intimacy. Consequently, girls will not use much aggression, as they are afraid that this would jeopardize their strong social bonds; boys however are not as afraid of this possible consequence (Cross & Madson, 1997). To our knowledge, this theory has not been empirically tested yet in combination with status profiles. Hence, the moderating effect of sex on the relation between social status and aggression will be tested in the current study. It is expected that boys show more aggression than girls in all different status profiles.

Current study

In the current study, the following research question will be answered: Do social statuses based on combinations of popularity and likeability of Dutch adolescents predict aggression, and do educational level and sex moderate these effects? Four mutually exclusive and collectively exhaustive groups will be created, based on scores of popularity and likeability: 'HP/HL', 'LP/LL', 'HP/LL', and 'LP/HL'. The group of LP/HL adolescents will be used as the reference group to compare the aggression scores of the groups HP/HL, LP/LL, and HP/LL. This reference group is chosen because it is expected that LP/HL adolescents will show the least amount of aggression of all clusters, which eases the interpretation of the results of the other groups. The current study expects to replicate the findings about LP/HL, HP/HL, and HP/LP mentioned above and aims to add to the previously mentioned framework of knowledge, by adding the group of adolescents who are LP/LL that has not been acknowledged before. Furthermore, the current study will bring insight into what direction the relations between social status and aggression go, as longitudinal data is used. Lastly, the moderation effects of educational level and sex have not been examined in combination with the distinct status profiles yet, and will thus be added in this study. The research model is depicted in Figure 1.
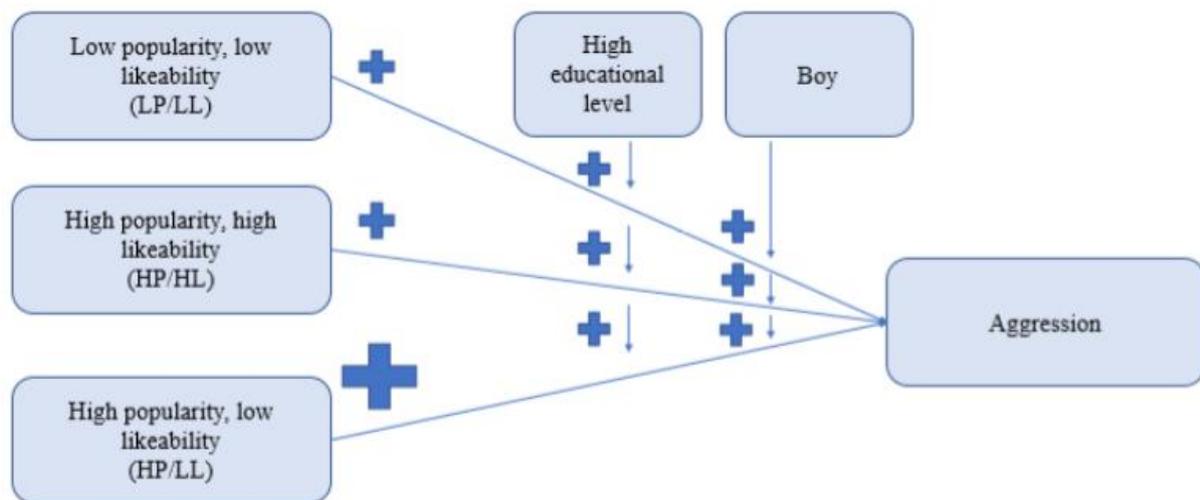

Figure 1. Research model.

Note. Reference group clusters consists of participants with low popularity and high likeability (LP/HL).

Methods

Procedure and participants

For the current study, longitudinal data of the Social Network Analysis of Risk behaviors in Early adolescence (SNARE) study are used. This study collected data on risk behaviors and peer relations from Dutch adolescents for 12 waves in total, with measurements in October, December, and March from schoolyear 2011/2012 until 2014/2015. Data were collected from one secondary school in the middle of the Netherlands and one in the north, that were willing to participate (Dijkstra et al., 2015). The students from the first and second year of all educational levels had received an information letter and based on this letter they could decide to voluntarily participate. The parents of the students received an information letter as well; they could send a reply card or an e-mail if they wanted to refrain their child(ren) from participating. Sixty-seven students refrained from participating (Dijkstra et al., 2015), resulting in 1850 adolescents participating in the SNARE study.

The participants were instructed by a researcher about the 45-minute questionnaire, which they filled out on the computer during class (Dijkstra et al., 2015). This took place during regular lessons and the teacher was present as well. Students who were not able to fill in the questionnaire that day were assessed within a month. Throughout this process, all participants remained anonymous and privacy was guaranteed. Data of waves 2 and 3 are used in the current study: December of 2011 and March of 2012. These waves were chosen because participants can still become more popular in the beginning of the school year, but this stabilizes during the year (Adler & Adler, 1995). Stable data are a more accurate representation of the real population, which is why data about social status gathered in wave 2 are used instead of wave 1. The variables popularity, likeability, and aggression consist of peer-nominations, which means that peers could still provide data about missing participants. Those data about the missing participants are therefore included in the analyses. Cases are only excluded from the dataset when peer-nomination data about them was missing. After deleting those cases, 1785 participants of the original 1850 participants were included.

Measures

Popularity (W2). The independent variable popularity was measured by two questions: 'Who are the most popular?' and 'Who are the least popular?'. The participants could nominate three peers from their class for each question. For each individual the nominations on each question were counted. In order to attain a proportional score, the number of nominations for

each question was divided by the number of classmates. The scores on the questions then varied between 0 (no nominations) and 1 (nominated by all classmates). Following Cillessen and Mayeux (2004a), the scores of 'least popular' were subtracted from the scores of 'most popular', and were standardized to simplify the interpretation and to ease the process of producing groups.

Likeability (W2). The independent variable likeability was measured by the questions: 'Who do you like (nice)?' and 'Which classmates do you dislike?'. For these questions, the participants could nominate three classmates as well. The same procedure was followed for likeability that had been followed for popularity. In the last step, the 'dislikes' were subtracted from the 'likes' and these final scores were standardized.

Aggression (W3). The dependent variable aggression was measured by peer-nominations on four questions: 'Who ridicules others?', 'Who are regularly bold against teachers?', 'Who sometimes fight and/or pick a quarrel with you?', and 'Who sometimes spread rumours/gossip about you?'. Participants could nominate three peers per question who fit the question best. Nominations for each question were counted for every individual. The scores on all four questions were made proportional, by dividing the number of nominations on each question by the number of classmates. The scores then varied between 0 (no nominations) and 1 (nominated by all classmates). To attain an overall score on aggression, the mean of the scores on the four questions was calculated for each participant. The Cronbach's Alpha for aggression was $\alpha = .75$ (standardized $= .82$).

Educational level (W2). The participants had different educational levels, ranging from lower than VMBO-bb to VWO/Atheneum/Gymnasium. The scores were made binary: lower than VMBO-bb to VMBO/HAVO were labelled 0, and HAVO to VWO/Atheneum/Gymnasium were labelled 1.

Sex (W2). Data on this variable were made binary: 0 = girl, 1 = boy.

Control variable. Aggression on W2 was included as control variable. The scores on this variable were coded in the same manner as Aggression on W3.

Creating clusters and statistical analyses

In order to statistically analyze the data, IBM SPSS Statistics 25 was used. As it was already known what clusters were to be created, they were made manually. To reach a sufficient number of participants in each cluster, the cut-off point of the z-scores for high and low was zero for both popularity and likeability. Participants were clustered as 'HP/HL' if both scores were above zero; they were 'LP/LL if both scores were below zero; they were 'LP/HL' if

popularity was below zero and likeability above zero; and they were 'HP/LL' if popularity was above zero and likeability below zero. To analyze the main effects, the bivariate effects, the effect of the control variables, and the moderators, a sequential multiple regression analysis was conducted, resulting in six models. To include the moderators, interaction terms of each moderating factor and each social status group was produced, resulting in 6 interactions. The three interactions for educational level were added in Model 4, and the interactions for sex were added in Model 5. Model 0 was included as well to examine the bivariate effects of the predictors.

Results

Descriptive results

The sample consisted of 1785 Dutch adolescents with M age = 13.05 (SD = .72, range = 11.09-17.69). 885 participants (49.6%) were female and 823 participants (46.1%) followed low education. In Table 1 the demographics of the sample and the descriptive results of the proportional scores of popularity, likeability, and aggression are shown. The mean of popularity was lower than the mean of likeability, meaning more people were nominated as liked than nominated as popular. The total mean of aggression was relatively close to zero, as well as the standard deviation, which could signify that in general few participants were nominated as behaving aggressively in this sample. Boys showed significantly more aggression (M = .067) than girls (M = .041) and girls were generally more liked (M = .354) than boys (M = .262).

Pearson correlations

In Table 2, the Pearson correlations of popularity, likeability, and aggression are shown. All correlations have a strong statistical significance, although likeability and aggression are not as strongly correlated as popularity and aggression. As expected, the correlation between likeability and aggression is negative, whereas the correlation between popularity and aggression is positive. Even though being liked and being popular are distinct domains (Parkhurst & Hopmeyer, 1998), the correlation between popularity and likeability is relatively strong (r = .51, $p \leq .01$). The moderators educational level and sex were not included in the correlations, as these are categorical variables with binary values, which would not produce any informative correlations.

Table 1

Demographics, and Mean, Standard Deviation, and Range of Popularity, Likeability, and Aggression (N = 1785)

Demographics	*N*	*M*	*SD*
Age	1785	13.05	.72
Gender			
Female	885 (49.6%)	-	-
Male	900 (50.4%)	-	-
Educational level	1784	-	-
Low	823 (46.1%)	-	-
High	961 (53.9%)	-	-

Research variables	*M*			*SD*			Range
	Girls	Boys	Total	Girls	Boys	Total	Total
Popularity	.009	.015	.012	.264	.301	.284	-.926 – .864
Likeability	.354	.262***	.308	.224	.240	.237	-.793 – .882
Aggression	.041	.067***	.054	.065	.083	.076	.000 – .556

Note. *N* girls = 885, *N* boys = 900. *** statistically different for girls and boys at $p \leq .001$.

Table 2

Pearson Correlations with Popularity, Likeability, and Aggression (N =1785)

Variable	Popularity	Likeability	Aggression
Popularity			
Likeability	.51** (.55**, .51**)	-	
Aggression	.34** (.30**, .38**)	-.19** (-.16**, -.17**)	-

Note. Total (Girls (N=885), Boys (N=900)). ** = statistically significant at $p \leq .01$.

The clusters

The four clusters were formed, and all participants were categorized into the appropriate group based on how they scored on popularity and likeability. After categorizing the participants, the groups were shaped as shown in Table 3. In correspondence with the results of

Table 1, girls were categorized more often into LP/HL than boys, who were more often categorized into HP/LL. Most participants (63.2% of the total sample) were clustered into either HP/HL or LP/LL. LP/HL will be used as the reference group, because it is expected that this group shows the least aggression, which eases the interpretation of the scores of the other groups.

Table 3

Composition of the Social Status Groups (N = 1785)

Variable	Girls (*N* = 885)	Boys (*N* = 900)	Total
Low popularity/low likeability (LP/LL)	210 (40%) [a]	315 (60%) [a]	525 (29.4%) [b]
High popularity/high likeability (HP/HL)	332 (55%)	271 (45%)	603 (33.8%)
Low popularity/high likeability (LP/HL)	238 (63%)	140 (37%)	378 (21.2%)
High popularity/low likeability (HP/LL)	103 (36.9%)	176 (63.1%)	279 (15.6%)

Note. [a] The percentage of girls/boys of the total number of participants in that cluster. [b] The percentage of adolescents who belong to that group of the total sample.

Assumption check

Before testing the hypotheses using multiple linear regression analysis, the assumptions for this analysis were checked. The residual statistics showed a maximum of 7.419, exceeding the allowed maximum of 3. A boxplot was made to check for outliers; 29 participants scored relatively high on aggression. However, because the data were collected via peer nomination and not self-report, and these data hold potentially interesting information about the participant, the outliers were not excluded from the analyses. Furthermore, the scatterplot showed a trend with many scores around zero on aggression, but because the sample size is big, it is expected this will minimally influence the analyses that will be run.

The clusters and aggression

Model 0 (Table 4) shows the bivariate relations between the predictors and aggression, to examine the direct relationship of each predictor separately. All factors, except the HP/HL participants scored significantly higher on aggression than LP/HL adolescents. The direct relationship of the clusters on aggression were tested in Model 1 of Table 4. All clusters had a significant positive effect on aggression, meaning that having one of these three status profiles predicted more aggression than the LP/HL group. HP/LL predicted the most aggression with β = .464 ($p \leq .001$).

In Model 2 educational level and sex were included as predictors, showing a significant effect of sex on aggression, but not of educational level. In Model 3, aggression on W2 was added as a control variable. Aggression on W2 significantly predicted a large portion of aggression on W3 (β = .768, $p \leq .001$), also accounting for much of the predictive power of all social status profiles and sex, which have decreased in their predictive value β and statistical significance from Model 2 to Model 3. However, the effects of the two groups HP/LL and HP/HL remain significant, suggesting a predictive power of social status on aggression. The explained variance of the model increases from $R^2 = .177$ for Model 2 to $R^2 = .647$ for Model 3.

Moderation effects

In Model 4 (Table 4), the interactions of the groups with educational level were added. Educational level had a positive effect on the relation between the HP/LL group and aggression (β = .026, $p \leq .01$). This means HP/LL adolescents show more aggression in higher educational levels than in lower educational levels (Figure 2). There was no significant interaction found with the other groups. In the last model, Model 4, sex was included as a moderator, but did not produce any significant moderating effects.
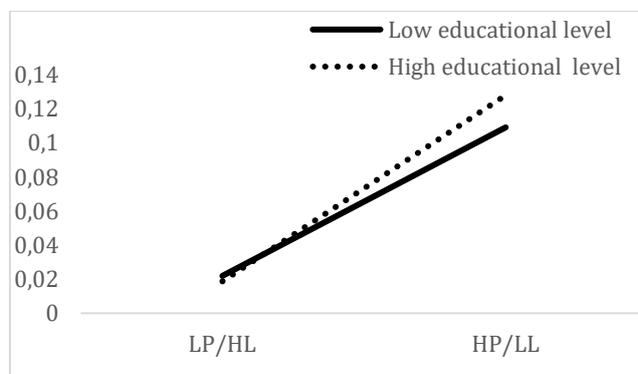

Figure 2. Interaction effect of educational level and LP/HL and HP/LL on aggression.
Note. Y-axis is mean score on aggression (W3).

Table 4.

Multiple Regression Analysis with Dependent Variable Aggression (W3), the Groups, Aggression (W2), and Moderators Educational Level and Sex (N = 1785)

Predictor	Model 0 B	SE B	β	Model 1*** B	SE B	β	Model 2*** B	SE B	β	Model 3*** B	SE B	β	Model 4*** B	SE B	β	Model 5*** B	SE B	β
LP/LL[a]	-.019	.004	-.115***	.021	.004	.124***	.016	.005	.095***	.001	.003	.013	.003	.005	.020	.006	.006	.034
HP/HL[a]	.006	.004	.039	.038	.005	.239***	.037	.005	.228***	.007	.003	.047*	.010	.005	.061*	.008	.005	.052
HP/LL	.074	.005	.356***	.097	.005	.464***	.091	.006	.437***	.017	.004	.088***	.009	.005	.043	.005	.007	.026
Aggression (W2)	.879	.016	.801***							.838	.017	.768***	.838	.017	.764***	.836	.017	.762***
Educational Level[b]	-.009	.004	-.059***				-.002	.003	-.015	-.001	.002	-.007	-.001	.005	-.009	-.001	.005	-.009
x LP/LL													-.004	.006	-.021	-.004	.006	-.019
x HP/HL													-.005	.006	-.024	-.005	.006	-.025
x HP/LL													.021	.007	.026**	.020	.007	.066**
Sex[c]	.026	.004	.169***				.020	.003	.129***	.004	.002	.028	.004	.002	.028	.003	.005	.019
x LP/LL																-.003	.006	-.017
x HP/HL																.004	.006	.019
x HP/LL																.007	.007	.026
R²				.161			.177			.647			.651			.652		

Note. [a] Reference group in every model is LP/HL. [b] Reference group is low educational level. [c] Reference group is girls. Model 0 are the bivariate effects of the predictors on aggression. x are interactions-terms. * statistical significance at p ≤ .05, ** statistical significance at p ≤ .01, *** statistical significance at p ≤ .001.

Discussion

In the current study, it has been examined if different status profiles, based on combinations of popularity and likeability, are related to aggression, and if educational level and sex interact with those relations. As predicted, all social status profiles showed more aggression in comparison with LP/HL. Furthermore, in line with the expectations, the results suggest that HP/LL adolescents show the most aggression of all status profiles, probably because they want to maintain their dominant social position (e.g. Cillessen & Mayeux, 2004a), and are not afraid to decrease their likeability, as they already are relatively not well-liked. The associations between the groups and aggression are strongest when examined cross-sectionally. When the longitudinal effect is examined, controlling for previous aggressive behavior, some of the links disappear. It appears that LP/LL adolescents do not show more aggression than LP/HL adolescents when examined longitudinally. However, because there was a strong positive association when not controlling for previous aggression, it is possible that for this group reversed causality is at play. Instead of LP/LL predicting more aggression, it could be that aggression predicts LP/LL. Firm conclusions cannot be drawn, as this direction of the effect has not been tested in the current study. Lastly, in line with expectations, HP/LL and HP/HL showed more aggression in comparison with LP/HL when controlled for previous aggression. In other words, popular adolescents, whether or not they were likeable, showed more aggression than when they would not be popular. This suggests that popular adolescents are at risk for being more aggressive, and therefore popularity can possibly act as a risk factor for aggression. This is in line with previous studies, showing a positive relation between popularity and aggression (e.g. Andreou, 2006; Cillessen & Mayeux, 2004a; LaFontana & Cillessen, 2002). Because HP/HL was related to somewhat less aggression than HP/LL, it seems that likeability acts as a small risk buffer for aggression. This is possible, because likeability is negatively related to aggression (e.g. Andreou, 2006; Cillessen & Mayeux, 2004a), and likeable adolescents are overall regarded as non-aggressive (Parkhurst & Hopmeyer, 1998). However, this risk buffer is not strong enough to completely extinguish the positive relation between popularity and aggression. This is possibly due to the weaker correlation between likeability and aggression than the correlation between popularity and aggression. These results suggest that popularity is of higher importance in predicting future aggression than likeability.

Partly as expected, HP/LL adolescents in higher educational levels showed slightly more aggression than HP/LL adolescents in lower educational levels, which was in line with the theory of Garandeau and colleagues (2011), and Jonkmann and colleagues (2009). However, this moderating effect was not found for HP/HL and LP/LL. Only one out of three interactions has been proven to be significant, and the moderation on the relation between HP/LL and aggression was weak. Therefore, the hypothesis that educational level moderates all relations between social status and aggression is rejected in the current study. The exact reason why a weak moderation has been found for HP/LL and not the other groups, is unclear. The main effect of the group HP/LL on aggression is the strongest of all groups, which could explain why it was more likely to find an interaction with this relation than with the relations of the other groups. Future research should further investigate whether a difference can be found in aggression shown by different social statuses in different educational levels, as the current research has shown divergent results.

The last hypothesis was rather explorative, but it was expected that in all social status groups, boys would show more aggression. The hypothesis was rejected, as no significant effect of sex on any of the relations between the clusters and aggression was found: for every social status, boys and girls show the same amount of aggression. This result suggests that both sexes aspire to be popular, and use aggression in the same manner to achieve this. As Cillessen and Mayeux (2004a) suggest, aggression may be a more stable personality trait; one that transcends sex. This implies that it depends on the individual's personal characteristics, rather than sex, how the relation between social status and aggression is established. An alternative explanation could be that social status explains all variance of the effect of sex. An extensive review of Björkqvise (2018) about gender differences in aggression shows significant results of men showing more aggressive behaviors, which was also found in the current study. However, not many studies have controlled for social status of the individuals. It is possible that in the current study no moderating effect of sex was found, because social status of the individual explains all variance in aggression, and thus transcends the effect of sex. When looking at the make-up of the clusters, it is clearly visible that LP/HL primarily consists of girls and HP/LL of boys. This implies that the effect of sex, where boys are more interested in attaining popularity than girls (Baumeister & Sommer, 1997), is already processed in the making of the clusters, which is why the effect is absent when adding sex as a moderator. As Hawley (2007) suggests, boys and girls do not behave accordingly

to their sex, but to their social status. Both explanations are possible, and future research should aim to discover where sex comes into play when social status and aggression are related.

Strengths and limitations

The current study has some strengths and limitations that need to be discussed. A great strength of the current study is that the predictors and outcome were measured by peer-nominations. It would not be necessary to give socially desirable answers, as it would not incriminate one's own behavior. Furthermore, if participants were absent during a test-day, peers could still nominate these participants, resulting in a minimum of missing data. Using longitudinal data is another strength, as this reveals more information about the direction of the relation between the factors. Controlling for previous aggression and still finding a positive effect of social status on aggression, suggests there really is an effect of social status on aggression. However, the effect of aggression on social status has not been tested. As LP/LL showed no longitudinal effect on aggression, it is possible that the effect is established the other way around; aggression leading to low popularity and low likeability. This reversed causality should be tested in further research with all groups to gain more insight into the LP/LL adolescents, and into the potential interplay with the other social status profiles as well. The flipside of using peer-nominations is that if participants had the feeling their answers were being observed by peers, they could still answer socially desirable to not incriminate them. The only solution to this problem is to let the participants fill out the questionnaire completely in isolation. It remains a struggle to make this feasible.

Conclusion and implications

In conclusion, LP/HL adolescents showed the least aggression, where LP/LL adolescents, HP/HL adolescents, and HP/LL adolescents showed, respectively, increasing aggression. However, only HP/LL adolescents and HP/HL adolescents differed significantly from the LP/HL group in predicting future aggression. Thus, high popularity, whether or not likeability was high, was a risk factor for aggression. This has implications for future research. Popularity is a stronger predictor of aggression than likeability, suggesting that the value adolescents give to popularity is higher than to likeability; they are even willing to aggress to attain popularity (Cillessen & Mayeux, 2004a). However, this antisocial behavior can lead to many negative outcomes, for both the perpetrator and the victim (Allen & Anderson, 2017; Loeber, 1990; Pederson et al., 2018). If

more information is gained about the reasons why adolescents value popularity over likeability, interventions could aim to mitigate the importance of using aggression to become popular. This information could be gained by conducting interviews with adolescents, and learning to understand their way of thinking about the constructs popularity and likeability. Furthermore, to further understand the interplay between the social status profiles and aggression, longitudinal, person-centered research should be conducted, using multiple waves of data, examining the relationship reciprocally. Cillessen and Mayeux (2004a) tried to uncover this reciprocal effect, but did not use a person-centered approach. If this approach is used in future research, more conclusions can be drawn upon the exact effects of social status, combining popularity and likeability, and aggression on each other.

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