

Status perceptions matter: Understanding disliking among adolescents

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Abstract:	The emergence of disliking relations depends on how adolescents perceive the relative informal status of their peers. This notion is examined on a longitudinal sample using dynamic network analysis (585 students across 16 classes in 5 schools). As hypothesized individuals dislike those who they look down on (disdain) and conform to others by disliking those who they perceive as being looked down on by their peers (conformity). The inconsistency between status perceptions also leads to disliking, when individuals do not look up to those who they perceive to be admired by peers (frustration). No evidence is found that adolescents do not dislike those who they look up to (admiration). Results demonstrate the role of status perceptions on disliking tie formation.



Status Perceptions Matter: Understanding Disliking among Adolescents

Interpersonal relationships among adolescents play a central role in their social development. Recent research suggests that although disliking ties are reported less frequently than liking relations, they are present in adolescents' everyday life and therefore drive their development in fundamental ways (Card, 2010). Compared to positive emotional relationships, such as friendship or liking, disliking ties are relatively rare (e.g., Baldwin, Bedell, & Johnson, 1997; Card, 2010; Gersick, Dutton, & Bartunek, 2000; Labianca, Brass, & Gray, 1998). Although disliking ties are scarce, they are very powerful: studies that successfully measured them found that disliking relations have a disproportionately greater effect on satisfaction, mood, performance and stress than liking relations, which has been described as a “*negative asymmetry*” (Labianca, Brass, & Gray, 1998; Labianca & Brass, 2006; Moerbeek & Need, 2003).

Disliking relations should be studied in a network context, given that they are *not independent* from each other (Huitsing et al., 2012). Disliking nominations depend on each other in various ways. They are often reciprocated (e.g., Berger & Dijkstra, 2013; Card, 2010) and balanced in triadic relations (Cartwright & Harary, 1956; Hummon & Doreian, 2003; Ludwig & Abell, 2007; Marvel, Kleinberg, Kleinberg, & Strogatz, 2011; Wang & Thorngate, 2003). Moreover, heterophobia exists as people dislike dissimilar others (Flache & Mäs, 2008). Going beyond these elementary structural processes, we argue that a crucial factor that requires particular attention for the explanation of the emergence of disliking relations is *status*.

Gaining status among peers represents a major goal for adolescents (Lindenberg & Steg, 2007; Pellegrini & Long, 2002), and high status adolescents are more influential than their low status peers as they have a major role to set the norm in a class (Rambaran, Dijkstra, & Stark, 2013). Status competition and the resulting status perceptions in particular are important drivers of the formation of relational ties and peer influence (e.g., Brechwald & Prinstein, 2011; Faris & Ennett, 2010; Faris & Felmlee, 2011; Faris, 2012). Only few studies attempted thus far to explain how status is responsible for the emergence of disliking ties (e.g., Berger & Dijkstra, 2013; Nangle, Erdley, Zeff, Stanchfield, & Gold, 2004).

Status competition has been understood in several different ways in the literature, just as status itself has various conceptualizations. *Sociometric popularity* (Nangle, Erdley, & Gold, 1996) and an *aggregated status attribution* measure, which was constructed as the difference between “popular” and “not popular” nominations by peers, have previously been

related to negative relations (Berger & Dijkstra, 2013). Due to substantial differences in their meaning, we argue that different status measures might have radically different implications for positive and negative tie formation (Moody, Brynildsen, Osgood, Feinberg, & Gest, 2011; Rodkin, Farmer, Pearl, & Van Acker, 2000). A conceptual clarification is needed, therefore, so that we can determine which forms of status competition can be attributed to the emergence of disliking relations.

We propose to differentiate between *first-degree status perception*, which reflects relative status difference between two individuals (e.g., *i* reports to look up to / look down on *j*), and *second-degree status perception*, which reflects status assessment of other peers (e.g., *i* reports that he/she thinks that *j* is looked up to / looked down on by peers). Based on classical sociological (Lanski, 1954; Merton, 1968) and social psychological (Berger, Rosenholtz, & Zelditch, 1980; Fiske, Cuddy, Glick, & Xu, 2002) literature, we hypothesize that not only the first-degree upward (downward) status perception, but also the *inconsistency* between *first-* and *second-degree* upward and downward status perceptions could be major determinants of disliking relations, due to tendencies for *frustration* and *conformity* that we explicate below.

Based on these theoretical origins, we propose a novel network-based perspective on how status processes can result in disliking among adolescents. We test our hypotheses in secondary school classes using stochastic actor-based models and a meta-analytical approach (Snijders, van de Bunt, & Steglich, 2010).

Theory and hypotheses

We define disliking as negative feelings that one individual holds towards another (Labianca & Brass, 2006). Disliking might be explained by social mechanisms similar to liking (e.g., by reciprocity). *Homophily* is a major dyadic force behind the emergence of liking relationships among individuals (McPherson, Smith-Lovin, & Cook, 2001). Friendship relations become more stable when they are based on similarity in behavior, social status, opinions and values (Nangle, Erdley, & Gold, 1996; Newcomb, 1956). *Heterophobia* is the mirror image of homophily, and describes the disliking of dissimilar others (e.g., Flache & Mäs, 2008).

In social networks, popular individuals often receive disproportionately more liking nominations such that there is a preferential attachment in friendship nominations (Dijkstra, Cillessen, & Borch, 2013; Eder, 1985). By contrast, individuals with radically different characteristics (Barrera, 2008) or members of low-status groups (e.g., Nangle, Erdley, &

Gold, 1996; Rydgren, 2004) are often considered as “black sheep” in the group and receive disliking nominations because peers dislike them.

Reciprocity is generally observed in friendship networks and has also been found in disliking relations (Berger & Dijkstra, 2013; Huitsing et al., 2012; Card, 2010). However, we cannot expect to find similarly strong effects in the disliking domain as in the friendship domain. The recipient of disliking nominations could accommodate to the situation and still maintain neutral or even positive evaluations of the popular sender (Della Fave, 1980; Stolte, 1983; Cook, Hegtvedt, & Yamagishi, 1988).

Due to *balancing motives*, disliking relations and friendship ties are interdependent (Cartwright & Harary, 1956; Hummon & Doreian, 2003; Ludwig & Abell, 2007; Marvel et al., 2011; Wang & Thorngate, 2003). From this perspective, disliking ties create balance in triads as friends create common “enemies”. In addition, common enemies might bring individuals together.

In the everyday life of adolescent groups, it is particularly important to consider how *status* and *disliking* are interrelated. Competition for status is a force that structures the adolescent community (Coleman, 1961). In closed groups, such as school classes, those who have high status are more likely to make decisions for the group, while having low status is associated with adjusting to opinions of other group members, and not participating in decision-making (Berger, Rosenholtz, & Zelditch, 1980; Anderson, Srivastava, Beer, Spataro, & Chatman, 2006). In order to study the impact of status processes on relational tie formation, we should first define the processes that might be relevant. Status, as a major aim adolescent compete for among themselves, has been understood and defined in various ways in the literature. Many studies, and social network studies in particular, suggested conceptualizing status as *sociometric popularity* (Freeman, 1979; Borgatti, 2005; Moody, Brynildsen, Osgood, Feinberg, & Gest, 2011; Logis, Rodkin, Gest, & Ahn, 2013). These studies typically measure status by adding up the nominations that individuals receive in the friendship network (Moody, Brynildsen, Osgood, Feinberg, & Gest, 2011). Based on the centrality index developed by Bonacich (1987), Gest et al. (2007) adjusted the definition to account for the status of the individuals who provide those nominations. Few of these studies related sociometric popularity to disliking relations (cf. Nangle, Erdley, & Gold, 1996; Nangle, Erdley, Zeff, Stanchfield, & Gold, 2004), although status measurements that combine liking and disliking ties are readily available (Bonacich & Lloyd, 2004).

An alternative way is to conceptualize status in a way that it reflects the degree to which individuals are perceived as being accepted or rejected by their peers in the group (Asher &

Coie, 1990; Gest & Rodkin, 2011; LaFontana & Cillessen, 2002). *Perceived popularity* describes the perception group members have about *who is considered popular* in the community (Luthar & McMahon, 1996; Rodkin, Farmer, Pearl, & Van Acker, 2000; Anderson, Srivastava, Beer, Spataro, & Chatman, 2006). A related approach combines nominations for popularity and unpopularity by subtracting the indegree of “not popular” nominations from the indegree of “popular” nominations (LaFontana & Cillessen, 2002; Berger & Dijkstra, 2013). If there is dissimilarity in status, lower status individuals reject higher status peers, or the opposite occurs, high status individuals dislike lower status peers (Berger & Dijkstra, 2013).

In our study, we refer to this indegree-based status measure as *aggregated status attribution*.

In line with earlier studies (LaFontana & Cillessen, 2002; Parkhurst & Hopmeyer, 1998), we argue that different status conceptualizations have different structural and behavioral meanings and implications. Sociometric popularity and aggregated status attributions are correlated, but the overlap might be low (Parkhurst & Hopmeyer, 1998; Cillessen & Rose, 2005). It seems that adolescents do not necessarily consider those peers as popular who they nominate as friends (Adler, 1998). Both status conceptualizations among adolescents, that is, sociometric popularity and aggregated status, however, seem to be important determinants of different behavioral and structural processes, including aggressive behavior (Moody, Brynildsen, Osgood, Feinberg, & Gest, 2011; Rodkin, Farmer, Pearl, & Van Acker, 2000).

Gaining a more fine-grained picture of which forms of status perceptions are detrimental to disliking relations, and necessary along with mapping how these perceptions are acted upon. In particular, we focus on first-degree and second-degree status perceptions as defined above. As these are different, it might happen that dyadic status perceptions are dissonant. Dissonance in status perception can result in anger, envy, jealousy and internal conflicts. This will in particular be the case when individuals perceive dissonance regarding the relatively high status of their peers. As the belief disconfirmation paradigm underlines, cognitive dissonance can occur when people are confronted with information that is inconsistent with their beliefs (Festinger, 1962). Status inconsistency theory also suggests that people whose status is inconsistent between dimensions are more frustrated and dissatisfied than people whose status is consistent through different dimensions (Lanski, 1954). In another tradition, relative deprivation theory reveals that internal conflicts occur when individuals compare their expectations of their own positions to the perceived status position of relevant

others and realize that these are dissimilar (Merton, 1968). According to these theoretical paradigms, dissonance can create frustration, which is an emotional response to social situations (Pastore, 1950). Frustration is particularly strong in case of fierce social competition (Dill & Anderson, 1995). Besides frustration that results from dissonance in status perception, individuals might try to resolve status inconsistencies by assimilating their emotions according to the perception they have on how others feel towards their peers (Fiske, Cuddy, Glick, & Xu, 2002; Smith, 2000).

This *conformity* process is in line with the fact that people tend to accommodate to the norms and beliefs of the community they are members of (Cialdini & Goldstein, 2004). For instance, dissonance regarding the perception of *low* status peers might result in conforming to the opinion of the majority, and individuals might start to dislike those who they perceive as being looked down on by others.

Stepping beyond the direct effects of status differentiations, we argue that dissonance in status perceptions which results in frustration or conformity could explain how disliking ties develop. For status perceptions, we operationalize

1.) *first-degree upward status perception* by asking individuals to nominate peers who they look up to;

2.) *first-degree downward status perception* by asking individuals to nominate peers who they look down on;

3.) *second-degree upward status perception* by asking individuals to nominate peers who they think other peers look up to;

4.) *second-degree downward status perception* by asking individuals to nominate peers who they think other peers look down on.

5.) In addition, similarly to Berger & Dijkstra (2013), we define *aggregated status attribution* as the difference between indegree ties of first-degree upward and first-degree downward status perceptions. Table 1 summarizes the status concepts and their measurement in our study.

Table 1: HERE

We formulate four main hypotheses on how different status conceptualizations could be related to the formation of disliking ties. The first two are direct effects of status perceptions.

H1 (*admiration hypothesis*): Individual i , who has a *first-degree upward status perception* of individual j , is *less* likely to develop a disliking tie to j .

H2 (*disdain hypothesis*): Individual i , who has a *first-degree downward status perception* of individual j , is *more* likely to develop a disliking tie to j .

The third and fourth hypotheses relate to status inconsistencies between first- and second-degree status perceptions. Note that it is the *inconsistency* between the first- and second-degree status perceptions, and *not* the direct effect of second-degree status perceptions, that is hypothesized to result in the emergence of disliking relations.

H3 (*frustration hypothesis*): Individual i , who has a *second-degree upward status perception* of individual j (who believes that j is looked up to by peers), but has no first-degree upward status perception of j , is more likely to develop a disliking tie to j .

H4 (*conformity hypothesis*): Individual i , who has a *second-degree downward status perception* of individual j (who believes that j is looked down on by peers), but have no first-degree downward status perception of j , is more likely to develop a disliking tie to j .

Table 2: HERE

As we discussed earlier, disliking relations are not independent from liking relations. This is also reflected in our conceptualization: we consider friendship, liking, disliking, and hate as part of the same one-dimensional scale. Consequently, in our analyses, we handle disliking together with friendship and we control for a number of related mechanisms in the disliking as well as in the friendship network. In particular, we take into account that, due to homophily and balancing motives, friendship ties are often reciprocated. Furthermore, friends of friends become friends, high status often attracts more friends than low status attribution, and friends will agree about having the same enemies (Davis, 1967; Heider, 1958; McPherson, Smith-Lovin, & Cook, 2001).

We control for possible differences between males and females. Gender plays a significant role in group and identity formation, especially among adolescents. Same gender interactions and friendships are more frequent than cross-gender interactions and friendship ties, and most disliking is also directed to same-gender peers (Garandau, Wilson, & Rodkin, 2010).

In addition, we also control for the similarity in socio-economic background, as it is a major factor for tie development among adolescents. Research studying friendship showed

that those who are from families with similar income and parental educational level are more likely to become friends (Mayer & Puller, 2008; Verbrugge, 1983). By contrast, we do not know whether dissimilarities in socio-economic background result in disliking or not.

Method

Participants

A subsample of 16 classes out of 40 of three waves of the Hungarian longitudinal network study “Wired into Each Other” is included in the analysis. Students were 9th graders in the first and in the second, and 10th graders in the third wave. The subsample was selected based on criteria that assured convergence of the estimation method. The reliable estimation of interdependence requires a sufficient number of observations and is highly sensitive to missing data (Huisman & Steglich, 2008). We selected classes with at least 20 students, with fewer than 20% missing participants and in which the disliking networks were sufficiently dense and stable.

Table 3 contains descriptive statistics of the participants. The subsample comprises 585 respondents ($N_1 = 535$, $N_2 = 522$, $N_3 = 501$). On average, 1.81 (*st. dv.* = 1.83) students per class joined or left between wave 1 and wave 2, while 6.44 (*st. dv.* = 6.32) joined or left between wave 2 and wave 3. On average, students were 15.26 years old in wave 1 (*st. dv.* = 2.78), and the average number of enrolled students per school class was 32.46 (*st. dv.* = 2.78). 62.5% of students in the subsample were female. This could be explained by the fact that our subsample is not representative of the relevant cohort population in Hungary. The subsample consists of classes from the three school types available in the Hungarian educational system: secondary grammar school (twelve classes), vocational school (three classes), and vocational training school (one class). Six classes are in the capital city Budapest, six classes are in towns with approximately 13,000 inhabitants, while four out of sixteen classes are located in a town with a population of 55,000 inhabitants.

Measures

Self-administered pencil-based surveys that included information about social background and educational attitudes were completed during regular classes with the help of trained interviewers. The data collection in each class took no more than 45 minutes. Parents had to give written consent for their child to participate in the study. Students without permissions were not included in the analysis, and students who were absent during the data collection were coded as missing. Students were assured that their answers would be kept

confidential and used for research purposes only. Relational information was collected between classmates only. School classes can be understood as small communities which become and remain closed groups during high school years in Hungary. For gathering network items, the full roster method was used, so that all students in a class could indicate their relationships with all classmates.

Dependent variables: disliking and friendship relations

A five-point Likert-scale is used to create disliking and friendship variables. Each student had to indicate their relationship with all classmates according to the following descriptions: “I hate him/her” (-2), “I dislike him/her” (-1), “He/she is neutral to me” (0), “I like him/her” (+1), or “He/she is a good friend” (+2). We merged the values -1 and -2 of the scale to create disliking social networks. For friendship, we used only the +2 value of the scale. Due to the design of the scale, disliking and friendship networks are mutually exclusive. Based on this scale, we created two binary adjacency matrices (disliking and friendship) for each school class (16) in each of the three waves. The total number of matrices was $16 \times 3 \times 2 = 96$. If student i , for example, dislikes student j , then the corresponding entry (i, j) in the disliking matrix is marked 1 (0 otherwise). A row i in a disliking/friendship matrix includes all disliking/friendship nominations of student i ; a column j in the matrix includes all the relationship nominations by others regarding student j . If a student joined the class after the data collection started or left during the data collection, and would therefore not appear in some of the questionnaires, this student is nevertheless included in all matrices, however, all values in the corresponding row and column are marked “structural zeros” to indicate that sending or receiving nominations was technically not possible (as the student was not the member of the class in the given period).

Independent variables: Dyadic status perceptions

As we outlined in Table 1, we used the following network items in order to test our hypotheses. With regard to the *admiration hypothesis* (H1), we used the question “who do you look up to” (indicating first-degree status upward perception). For the *disdain hypothesis* (H2), the question “who do you look down on” (indicating first-degree status downward perception) was used. For the *frustration* (H3), and the *conformity* (H4) hypotheses, we created two variables: (1) when individual i perceives j as being high in status in general (i has second-degree status upward perception of j), but does not look up to j himself (i does not have first-degree status upward perception of j); and (2) the mirror case for downward status perceptions: individual i perceives j as being low in status in general (i has second-degree status upward perception of j), but does not look down on j himself (i does not have first-

degree status downward perception of j). We created binary coded matrices for these status perception measures similarly to disliking and friendship networks. We used the first two waves of status perception measures in our analysis, because we tested the effect of status perceptions at the beginning of a period on sub-sequent changes in disliking and friendship ties.

Participant covariates

In addition to the dyadic status perceptions discussed above, we also constructed an aggregated status attribution variable. It was calculated by subtracting *first-degree status downward perception* (“who do you look down on”) from *first-degree status upward perception* (“who do you look up to”). Then, we standardized the values creating z-scores within classes. In line with the procedure described by Berger and Dijkstra (2013), status was transformed into a categorical variable. The continuous z-score as cut-off points were used to create the 4-point scale status measure, where 1 indicates when someone has low, and 4 when someone has high aggregated status attribution.

Socio-economic background (SES) is an essential demographic covariate. For capturing SES, factor points were calculated from the mother’s highest education level and the number of books families has at home using categorical principal component analysis (CATPCA). The goal was to decrease an original set of variables into a smaller set of uncorrelated components that represent most of the information found in the original variables. This approach aims at the same goals as traditional principal component analysis, but it is suited for variables of mixed measurement level that may not be linearly related to each other (Manisera, Van der Kooij, & Dusseldorp, 2010, p. 101). As the mother’s education level and the number of books families have did not change significantly in the majority of cases during the time of the data collection, we calculated the average values of the three waves. Missing data on factor points were imputed using average or single values of data from the other waves. We created a 3-category variable based on quintiles (Vyas & Kumaranayake, 2006), where scores between 0-40% quintiles were coded as low, scores between 40-80% were coded as medium, and over 80% they were coded as high socio-economic status. In addition, we included gender as an important constant covariate. Male students were coded by 0 and female students by 1.

Analysis

We modeled the effect of dyadic status perceptions on change in disliking and friendship relations longitudinally with stochastic actor-oriented models (SAOMs, Snijders, van de Bunt,

& Steglich, 2010). Models were estimated with RSiena 4.0 (Ripley, Snijders, Boda, Vörös, & Preciado, 2014). The SAOMs that we specified assumed that two mutually exclusive networks (disliking and friendship) evolve as a stochastic process based on actors' preferences. The preferences are described as linear elements in actor-oriented objective functions. The elements represent if changes in the set of outgoing ties of one actor are endogenously determined (e.g., structures in the disliking network explain changes of disliking relations), if they depend on participant covariates (e.g., gender homophily), if they depend on dyadic covariates (e.g., status perceptions), or if the networks co-evolve (e.g., students who have a common "enemy" are more likely to become friends).

SAOMs assume that each actor in a network is evaluating their position in the current network according to the current network's characteristics, which are the specifications found in the model. More formally, when there is an opportunity for an actor to make a change, the probability of any given change is assumed to be proportional to the exponential transformation of the objective function (Snijders, van de Bunt, & Steglich, 2010). In our analysis, we used both disliking and friendship as dependent network variables. For both networks, we examined the following structural network effects: *outdegree* (density, the number of outgoing ties), *reciprocity* (the tendency that ties will be reciprocated), *indegree-related popularity* (the tendency that actors with a high number of incoming ties will attract extra incoming ties; in the case of disliking relations this is called "black-sheep effect"), *outdegree-related popularity* (the tendency that actors with a high number of outgoing ties will attract extra incoming ties; in the case of disliking relations this is called "hater effect"), *transitive triplets* (the tendency of individuals to be "friends with the friends of their friends" or to be "enemies with the enemies of their enemies"), and *3-cycles* (the tendency of actors to form circular friendship or disliking structures). We also included the *outdegree isolates* effect to represent the transition from 0 to 1 as it is not the same as the transition from n to $n+1$ nominations. Some individuals have and maintain an outdegree of zero, especially in the disliking network.

For testing the effect of status perceptions on disliking ties, we created changing dyadic covariate effects ("varDyadCovar"). We used first-degree status upward perceptions to test hypothesis 1, and first-degree status downward perceptions to test hypothesis 2. We used the inconsistency measures for examining hypothesis 3 (referred to as "inconsistency up") and for hypothesis 4 (referred to as "inconsistency down"). The definition of these four effects is in line with the hypotheses outlined in Table 2.

We created a changing covariate (“varCovar”) effect to control for status attributions. We tested whether those who score high on the aggregate status scale tend to nominate more disliked peers and friends (*ego effect*), tend to be more frequently nominated than those low on the scale (*alter effect*), and whether participants tend to nominate those who are on a similar level of the status scale (*similarity effect*).

To control for whether students with high socio-economic background are more likely to send or receive nominations, or those who are similar in socio-economic background are more likely to nominate each other as disliked, we also used a constant covariate (“coCovar”) effect. Similarly to socio-economic background (SES), gender is also a constant covariate. Girls are more likely to send and receive friendship and disliking nominations. Same-gender nominations are more likely than cross-gender nominations in both networks.

Finally, we included two multiple network effects. The effect of *friendship leads to disliking agreement* reflects that being friends will lead to disliking the same person. The effect of *disliking agreement leads to friendship* models whether sharing the same disliking ties facilitates friendship creation. Both effects exhibit the interplay between multiple networks by showing how the disliking and friendship networks influence each other over time.

Additionally, the two networks are combined by the design of the questionnaire, as a participant cannot maintain a friendship and a disliking tie with the same person at the same time: the estimation process takes this into account. The estimation is done in two steps. First, we analyzed classes separately while making sure that the algorithm converged well according to the procedure described in Ripley, Snijders, Boda, Vörös, & Preciado (2014, p. 57). Second, we conducted a meta-analysis of the results per class as described in Snijders and Baerveldt (2003).

To test how well the proposed model specifications fit a set of observations, we ran goodness of fit (GOF) analyses. GOF compares static network descriptive statistics of the empirical networks with the same descriptive statistics of the simulated networks (Ripley, Snijders, Boda, Vörös, & Preciado, 2014, pp. 48–49). We ran GOFs class by class for indegree and outdegree distribution both in the disliking and friendship networks. Results showed that p values in 13 classes are over 0.1, so we managed to capture statistically good model specifications in most of the classes, thus meta-analysis could be performed.

Results

Descriptive statistics

Table 3: HERE

The upper part of Table 3 presents descriptive statistics of the disliking and the friendship network, information about aggregated status attribution and gender. The average number of disliking nominations received through the three observed waves is 2.39 ($st.dv.=3.06$), which is a lower value than half of the number of friendship nominations ($M=5.85$, $st.dv.=3.47$). The rather high standard deviation in the case of disliking ties reflects that there might be few students who receive many disliking nominations (“black sheep”). In disliking networks, the clustering coefficient is much lower ($M=0.18$, $st.dv.=0.8$) than in friendship networks ($M=0.5$, $st.dv.=0.08$). This suggests that in disliking networks it is less common that actors form structures in which three are all connected to each other. Indegree centralization indicates whether a network is rather centralized (value over 0.5) or decentralized (value lower than 0.5). The mean indegree centralization is slightly higher in the case of disliking networks (0.28 compared to 0.2), so both networks are rather decentralized. The Jaccard-indices indicate that friendship relations tend to be more stable over time than disliking relations (friendship: 0.34-0.38; disliking: 0.17-0.18). However, there is significant change in both networks. A value of 1 would indicate that there is no tie in the network between subsequent data collection waves, a value of 0.5 indicates that 50% of the ties are observed in either of the two waves.

Table 4: HERE

Table 4 shows the cross tabulation of the main independent variables that are related to the hypotheses formulated in the theory section. Dyadic status perceptions of the first two waves are presented in the table, as they are included in the RSiena analysis as changing covariates. We find that 12.05% of the nominations are first-degree upward nominations, which may explain the absence of disliking relations according to the *admiration* hypothesis (H1). We find that 19.84% of the nominations are first-degree status downward nominations related to the test of the *disdain hypothesis* (H2). We find that 19.04% of the nominations are only second-degree upward nominations, but not first-degree upward nominations. This

relates to the *frustration hypothesis* (H3). We find that 49.07% of the nominations are only second-degree status downward perception ties, but not first-degree downward nominations. These cases should explain disliking according to the *conformity hypothesis* (H4).

Table 5a and 5b: HERE

Table 5a and Table 5b contain the values of the Pearson and Spearman correlations between standardized proposition values of indegree and outdegree of the main dependent, independent and control variables in wave 1 and wave 2. We can see that both first- and second-degree downward status perceptions correlate positively and significantly with disliking indegree, while we can see the opposite for friendship ties. We also find that those who have high values on aggregated status attribution and socio-economic background are more likely to receive friendship nominations, while we can see that low status indicates disliking nominations. Correlations results do not show evidence for the association between gender, indegree and outdegree nominations.

Table 6a and 6b: HERE

SAOM results

The results of the estimated stochastic actor-oriented models (Snijders, van de Bunt, & Steglich, 2010) are presented in Table 6a and Table 6b. Two models were estimated. Model 1 is a baseline model which includes all control variables. Model 2 additionally includes the effects related to the hypotheses of this paper. We use this two-step model construction to investigate whether the inclusion of the novel status attribution effects change the estimates and the significance of the control effects. This, however, is not the case. Each of the two models consists of two sub-parts. In Table 6a are presented all effects that are related to the dynamics of the disliking networks, in Table 6b are presented the effects related to the friendship network dynamics. The two processes are interdependent. The simulation-based RSiena method takes the disjoint nature of both networks into account and does not allow for the existence of overlapping disliking and friendship ties. If a disliking tie is to be turned into a friendship tie, this can only happen in two steps, first, by dissolving the disliking tie, second, by adding a friendship tie. Further, the two processes are combined by the inclusion of triadic cross-network effects of *disliking agreement leads to friendship* and *friendship agreement*

leads to disliking that are discussed below. Each model is described by the effects included, the effect estimates and their standard errors. The reported estimates and standard errors are based on separately estimated models of the 16 school classes, which are combined in a meta-analysis (Snijders & Baerveldt, 2003). Significance levels are indicated. We further report the estimated standard deviation of estimates between school classes (σ) and whether the standard deviation significantly differs from zero. The final column in each model shows the number of school classes that were used in the meta-analysis. More information on the estimation method, meta-analysis and effect interpretation can be found in the RSiena manual (Ripley, Snijders, Boda, Vörös, & Preciado, 2014).

Disliking and friendship explained by endogenous effects

Disliking and friendship can partly be explained by endogenous network effects. Endogenous disliking effects are shown in rows 3-9 in Table 6a, while endogenous friendship effects in rows 26-32 in Table 6b. In both networks we find that the number of ties maintained by an actor is limited (*negative density* effects), and that individuals tend to reciprocate both friendship (1.78***) and disliking (0.52***) nominations (*reciprocity* effects). The *transitive triplets* effect (“friends of a friend become my friend”) is positive and significant in friendship networks (0.25***), but not in disliking networks (“enemies of an enemy are not necessarily my enemies”). This is not surprising and it occurs mainly because we control for outdegree isolates. In contrast, we find that in disliking networks circular tie formation (three-cycle effect, -0.15***) is avoided (“enemies of an enemy are not my enemies”). Both findings are in line with balance motives.

Indegree popularity is the tendency to dislike those / become friends with those who are disliked / liked by many. In the disliking network this effect is clearly observed (0.09***). This finding relates to the “black sheep effect” in disliking networks. In the friendship network, however, we do not observe a similar tendency towards indegree centralization. *Outdegree popularity* is the tendency that actors with a high number of outgoing ties will attract extra incoming nominations. In the disliking network, the effect is positive, but not significant, which means that we do not find evidence that there are “haters who are becoming hated”. The negative and significant outdegree popularity effect means that those who nominate many friends are less likely to be nominated as friends (-0.15**). This finding is probably related to hierarchical tendencies in the friendship network. The friendship three-cycle effect, which is often interpreted as revealing tendencies for hierarchization, was indeed negative and significant without this parameter being included. The *outdegree isolate* effect is significant only in the disliking network. Its negative value indicates that the transition from 0

to 1 disliking nominations is less likely (-3.13^{***}) than a transition from $n > 0$ to $n + 1$ disliking nominations. Some students may intentionally choose not to participate in the “disliking game” by not nominating anyone. Results show that the transitions from 0 to 1 and from n to $(n + 1)$ disliking nominations are very different in the disliking and the friendship network.

Disliking and friendship explained by first- and second-order status attributions

The effect of first-degree status perceptions and the inconsistency between the first- and second-degree status perceptions (effects 10-13 in disliking and 33-36 in friendship networks in Model 2) are the core effects in this article and are, in the disliking submodel, directly related to our four hypotheses.

Hypothesis 1 (admiration) states that individuals who look up to someone (first-degree status upward perception) are less likely to nominate this person as someone they dislike. This argument is in line with the work of Fiske, Cuddy, Glick, & Xu (2002). We find no evidence for this admiration mechanism in the disliking networks.

Hypothesis 2 (disdain) states that individuals who look down on someone (first-degree status upward perception) are more likely to dislike this person. This expectation is based on the findings by Pastore (1950) and Dill and Anderson (1995). We find clear evidence for this hypothesis. The effect *disliking: first-degree status downward perception* (0.20^*) indicates that the log odds of creating a disliking tie to someone who is perceived to be in a lower-status position are 1.22.

Hypothesis 3 (frustration) is also supported by the empirical results. The hypothesis states that individuals who perceive someone as popular in the eyes of others (positive second-degree status perception), but do not look up to this person themselves (no positive first-degree status perception) will be more likely to dislike this person. The argument is based on the inconsistency and relative deprivation theory discussed in the theory section in Cronje (2005), Lenski (1954) and Merton (1968). The positive inconsistency effect (0.13^*) indicates that this mechanism is prevalent. The log odds of a disliking tie to emerge in the situation of positive status inconsistency are 1.14. Creating such a tie is, therefore, 14% more likely than the creation of a disliking tie with an individual whose high status is not perceived as inconsistent by the sender of the tie.

Hypothesis 4 (conformity) states that downward status inconsistency will lead to disliking rather than to a positive emotional response. If someone is perceived as low in status according to others (second-degree status perception downward) but ego does not look down on the same person (no second-degree status perception downward), then the probability of disliking will still increase. We argue that in the case of negative status attributions, the

second-degree effects will outweigh the first-order effects. This argument is in line with Cialdini and Goldstein (2004). We find strong evidence for this conformity effect (0.22^{**}). The log odds of a corresponding choice are 1.25. Therefore, creating a disliking tie with an individual whose high status is not perceived as inconsistent by the sender of the tie is 25% more likely.

The four effects that relate to the four hypotheses on disliking relations were also included in the friendship network model. We find that looking up to someone (first-degree status upward perception) increases the probability of creating a friendship tie (0.36^{***}), whereas looking down on someone (first-degree status downward perception) decreases the probability of friendship relations (-0.38^{**}). These two findings are in line with the predictions of the admiration (H1) and the disdain hypothesis (H2). In the case of positive status inconsistency, however, we find that the reaction to creating friendship ties is the opposite to create disliking ties. Individuals who perceive that someone is popular in the eyes of others but do not look up to the same person will yet be more likely to become friends with that person (0.12^*). In the friendship network we observe a positive conformity effect rather than frustration as a response to this perceived inconsistency (H3). The effect of negative status discrepancy on friendship is on the borderline of being significant, but the negative estimate (-0.22^*) indicates that in this case too conformity processes dominate decisions on the creation of network ties.

Disliking and friendship explained by aggregated status attribution

We used the aggregated status attribution measure (LaFontana & Cillessen, 2002; Berger & Dijkstra, 2013) as a baseline control variable in both Model 1 and Model 2. We mostly confirm the findings of Berger and Dijkstra (2013), and net of these effects we have clear results regarding the dyadic status perception effects. Ego and alter effects in the disliking network are positive (*ego* = -0.07^{**} in Model 2, and -0.08^{**} in Model 2; *alter* = -0.09^{***} in Model 1, and -0.07 in Model 2). Unlike Berger and Dijkstra (2013, p. 22), we do not find evidence for aggregated status homophily in the disliking network. In the friendship network, ego effects are negative (-0.06^{***} in Model 1, and -0.07^{***} in Model 2), which means that low aggregate status participants are less likely to nominate friends. However, we report a positive alter effect (0.07^{**} in Model 1, and 0.06^* in Model 2), which indicates that high aggregate status participants are more likely to be nominated as friends. The effect of friendship status homophily is positive and not significant. The estimates and standard errors of the aggregate status effects do not vary a lot between Model 1 and Model 2,

in which the novel first- and second-degree status attribution effects are included. This indicates that these two types of status measures indeed evaluate different dimensions.

Disliking and friendship explained by control effects

We control for the effect of socio-economic status and gender on the formation and maintenance of disliking and friendship ties. We test whether females and those who have higher SES are more likely to create and maintain disliking and friendship ties (*ego effect*), and tend to be more frequently nominated (*alter effect*). We test whether we find a higher probability of ties emerging between same-gender students or participants of similar social background (*similarity effect*). In the case of friendship network ties, we refer to this similarity effect as homophily. We only find evidence for one of the SES-related covariates in Model 2: higher SES students seem to be more likely to attract disliking nominations (0.1*). Among the six gender-related control mechanisms we find weak to strong evidence for three: same-gender students are slightly more likely to dislike one another (0.11+) and to become friends (0.34***). The latter indicates gender homophily in the friendship network. Further, boys tend to induce more friendship nominations (-0.20***) than girls.

Disliking and friendship explained by cross-network effects

The effect “*friendship agreement leads to disliking*” describes the tendency of individuals to dislike those people their friends dislike. This effect is significantly positive and strong in Model 1 and Model 2 as well (0.17***). The log odds of disliking someone are 1.19 for each additional friend who dislikes that person. The effect shows the tendency to become and remain friends with someone ego has a common “enemy” with. The effect “*disliking agreement leads to friendship*” (0.07*) indicates that the log odds to become friends with someone are 1.07 for each third person that both of them dislike.

Change rates of disliking and friendship

Disliking and friendship relations change over time and the estimated rate parameters indicate the average number of considered network changes per actor per period. As the analyses are based on three waves of data collection, rates for two in-between periods are estimated in each network. We find that the friendship networks tend to change faster (Model 1: 11.65 and 10.01; Model 2: 11.69 and 10.15) than the disliking networks (Model 1: 8.24 and 8.85; Model 2: 8.60 and 8.67). The rates differ significantly between classes. Note that due to the outliers in a small number of classes, not all estimates were considered for the meta-analysis (10 parameters in Model 1 and 13 in Model 2).

Discussion

Competition for status among adolescents often manifests in disliking ties – the emergence of these can indeed be explained by status perceptions. Thus, in this paper, we investigated how disliking and status considerations are interrelated. Our starting point was the broad knowledge about mechanisms which lead to friendship formation among adolescents, such as reciprocity, transitivity and homophily on different attributes. Taking these known mechanisms of friendship formation into account, we searched for a deeper understanding of how status perceptions relate to disliking tie formation.

We analyzed the effect of dyadic status perceptions on disliking tie formation among adolescents from a longitudinal social network perspective. We used a stochastic actor-oriented network tool implemented for RSiena. In the models estimated we considered the simultaneous co-evolution of disliking and friendship ties, structural effects, as well as the impact of socio-economic background and gender. We differentiated between who is “looked up to” or “looked down on” (defined respectively as *first-degree* status upward and downward perceptions) and “who is seen as looked down on or looked up to by others” (defined respectively as *second-degree* upward and downward status perceptions) in the eye of the focal actor. We formulated four hypotheses. According to the first hypothesis (*admiration*, H1), if an individual i looks up to individual j (first-degree status perception); i is less likely to develop a disliking tie to j . Our results did not confirm the admiration hypothesis. According to the second hypothesis (*disdain*, H2), if an individual i looks down on individual j ; i is more likely to develop a disliking tie to j . Our analysis showed support for this hypothesis. Furthermore, we hypothesized that *frustration* occurs when there is an inconsistency between first -and second degree status upward perceptions: individual i believes that j is looked up on by peers, but i does not look up on j ; and this leads to the emergence of disliking (H3). The frustration hypothesis has also received support in our data. Finally, we proposed that when an inconsistency occurs between first- and second-degree downward measures, such that individual i believes that j is looked down on by peers, but i does not look down on j , i will be more likely to develop disliking towards j (*conformity*, H4). We found support also for this mechanism.

We found that three of the mechanisms operate inversely in the friendship networks. Interestingly, however, we found evidence that inconsistency in positive status perceptions relates to the creation of both disliking and friendship ties. We also controlled for network-related parameters in our analysis. We found that disliking ties are often reciprocal, and indegree popularity is also positive, thus “black sheep” actors are more likely to be disliked.

We found evidence for different balance mechanisms, such as “the enemies of friends tend to be enemies.” Furthermore, we found that in disliking networks circular tie formation is avoided (“enemies of an enemy are not my enemies”). We also found that the *outdegree isolate* effect is significant only in the disliking network, thus some students do not nominate anyone as disliked. In line with the work of Berger and Dijkstra (2013), we found that lower position in the aggregated (and not dyadically measured) status perception hierarchy leads to the formation of disliking ties, as those who are low in the hierarchy are also more likely to be nominated as disliked. We found evidence that same-gender students are slightly more likely to dislike one another or to become friends (however, this pattern differs significantly between schools). The latter indicates gender homophily in the friendship network. Further, boys received more friendship nominations than girls.

Naturally, our study has its limitations. First, we have data from a geographically restricted (Hungarian) sample. Future research needs to validate our results in other cultures to assess whether the observed processes apply generally. Second, we have not included popularity and other possible conceptualizations of status such as respect in our analysis. Third, we did not treat status perceptions as a co-evolving dependent variable. For example, when a disliking emotion between i and j develops first between high status peers, but i does not conform to this, this might make j angry and a disliking tie can develop from j to i . Fourth, although we have conducted additional analyses that controlled for possible effects of some background characteristics, we could have missed some individual variables, such as self-esteem and fundamental psychological traits, which are relevant for disliking tie formation. Fifth, we did not hypothesize any main effect of second-degree status perceptions. Although we did not report them, we also ran models in which we tested the effect of second-degree downward and upward status perceptions on disliking tie formation. We found a relationship between second-degree downward status perception and disliking, but not between second-degree upward status perception and disliking. Furthermore, to avoid complex models, we did not differentiate between possible differences in creating and maintaining disliking relations.

Besides these limitations, there are many potential future research directions. Our data showed that disliking ties are more likely to occur between friends; therefore, one could also move beyond the dyadic level and analyze the emergence of disliking ties in wider contexts, for example in cliques. Laursen et al. (2010) examined opposition between cliques in schools, and found that disliking ties develop as a consequence of dissimilarity and competition between groups. In addition, it might be of interest to investigate the relation between personality traits and disliking ties. Selfhout and his colleagues (2010), for example, explored

this relation in the context of friendship networks. For instance, those who are seen introverted or less open are more likely to be disliked. Ethnicity is also a strong predictor of forming friendships (Feld & Carter, 1998; Kao & Joyner, 2004; McPherson et al., 2001). Even though our dataset contains classes with different ethnic composition, we were not able to control for ethnicity, because the presence of ethnic minorities in the classroom was correlated with larger turnover and lower response rates.

We believe that our paper is a notable contribution to the research on status and disliking, a study, which demonstrates the importance of dyadic status perceptions in the formation of disliking relations as well as the interplay between friendship and disliking. We hope that this novel way of analyzing status perceptions helps to understand more how rejection and acceptance occur between adolescents.

For Review Only

Appendix

1. Stability is measured with the Jaccard-index. The Jaccard-index describes the proportion of stable relations of the total number of created, dissolved and stable relations. The value is between 0.0 and 1.0, where 1.0 indicates that the two networks are exactly the same, and there is no structural change. For dynamic network analysis, according to Ripley, Snijders, Boda, Vörös, & Preciado (2014), it is recommended to include networks where the Jaccard-indices are above 0.3. However, we observe that, because of the scarcity of disliking networks, the values are in general lower than 0.3. For this reason, we consider a threshold value of 0.1 as acceptable for capturing disliking tie changes.
2. The increase in the number of those who joined and left between waves is mainly explained by the fact that the first and second wave of the data were gathered in the same, while the third were collected in the consecutive academic year.
3. We did not estimate models for liking separately, as friendship represents a stronger emotional feeling with stronger structural determinants than liking. Moreover, with regard to density and stability, friendship is more similar to disliking than liking.
4. Mother's educational level was measured by 7 categories: 1=fewer than 8 years of primary school, 2=primary school, 3=vocational training school, 4=vocational school, 5=secondary grammar school, college (BA/Bsc), university (MA/Msc); Number of books had 6 categories: 1=0-10, 2=11-25, 3=26-100, 4=101-200, 5=201-500, 10=more than 500 books.
5. Mother's educational level and the number of books were used as factor points as their eigenvalue (1.46) and variance (0.73) were the highest among all the possible other variables, such as the father's educational level, a list of objects possessed at home, and whether the student has a room where he/she can study without being disturbed.

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Tables

Table 1
Definition of the different status dimensions

<i>Terminology</i>	<i>Definition</i>	<i>Type</i>	<i>Survey question</i>	<i>Abbrev.</i>
First-degree upward status perception	The perception of <i>j</i> 's relative high status by <i>i</i>	Dyadic	"I look up to him/her."	1↑
First-degree downward status perception	The perception of <i>j</i> 's relative low status by <i>i</i>	Dyadic	"I look down on him/her."	1↓
Second-degree upward status perception	The perception of <i>i</i> about <i>other</i> actors' opinions of <i>j</i> 's high status	Dyadic	"I think he/she is looked up to (by others)."	2↑
Second-degree downward status perception	The perception of <i>i</i> about <i>other</i> actors' opinions of <i>j</i> 's low status	Dyadic	"I think he/she is looked down on (by others)."	2↓
Aggregated status attribution	Defining <i>i</i> 's position by subtracting nominations of first-degree downward status perception from first-degree upward status perception	Attribute	Indegree of "I look up to him/her." <i>minus</i> Indegree of "I look down on him/her."	

Table 2
Proposed hypotheses on disliking

		<i>Second-degree status perception</i>		
		Upward 2↑	No nomination	Downward 2↓
<i>First-degree status perception</i>	Upward 1↑	H1 -		
	No nomination	H3 +		H4 +
	Downward 1↓		H2 +	

Table 3
Descriptive statistics of the sample and the main variables

	Mean	SD	Min.	Max.
<i>General descriptive statistics</i>				
Class size w1	32.46	2.78	25.00	37.00
Network missings per class (%)	8.00	10.02	0.00	27.27
Number of students joining & leaving w1-w2	1.81	1.83	0.00	6.00
Number of students joining & leaving w2-w3	6.44	6.32	1.00	19.00
Age w1	15.26	0.54	14.25	18.33
<i>Disliking Network</i>				
Indegree w1-w3 (D)	2.39	3.06	0.00	19.00
Reciprocity (D)	0.18	0.12	0.00	0.45
Clustering (D)	0.18	0.08	0.00	0.41
Indegree centralization (D)	0.28	0.11	0.12	0.51
Jaccard coefficient w1-w2 (D)	0.18	0.04	0.11	0.23
Jaccard coefficient w2-w3 (D)	0.17	0.05	0.10	0.27
<i>Friendship Network</i>				
Indegree w1-w3 (F)	5.85	3.47	0.00	24.00
Reciprocity (F)	0.56	0.10	0.26	0.72
Clustering (F)	0.50	0.08	0.36	0.69
Indegree centralization (F)	0.20	0.06	0.09	0.42
Jaccard coefficient w1-w2 (F)	0.38	0.10	0.21	0.55
Jaccard coefficient w2-w3 (F)	0.34	0.11	0.16	0.51
<i>Control variables</i>				
Aggregated status attribution w1-w3	2.49	1.14	1.00	4.00
Socio-economic status (SES)	2.26	0.67	1.00	3.00
Female (%)	62.50			

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Table 4

Cross tabulation of the first- and second-degree status perceptions in waves 1-2

		<i>Second-degree status perception</i>			Sum
		Upward 2↑	No nomination	Downward 2↓	
<i>First-degree status perception</i>	Upward 1↑	523 (5.35%)	503 (5.15%)	149 (1.52%)	1175 (12.03%)
	No nomination	1860 (19.04%)		4793 (49.07%)	6653 (68.12%)
	Downward 1↓	65 (0.66%)	890 (9.11%)	983 (10.06%)	1938 (19.84%)
	Sum	2448 (25.06%)	1393 (14.26%)	5925 (60.66%)	9766 (100%)

Table 5a
Correlations of the main variables in waves 1-2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
<i>Indegree</i>															
(1) Friendship															
(2) Disliking															
(3) Upward 1↑	0.40	***	-0.25	***											
(4) Downward 1↓	-0.29	***	0.70	***	-0.21	***									
(5) InconsistencyUp↑	0.25	***	-0.18	***	0.71	***	-0.18	***							
(6) InconsistencyDown↓	-0.14	***	0.39	***	-0.11	***	0.08	**	-0.11	***					
<i>Outdegree</i>															
(7) Friendship	0.39	***	-0.14	***	0.13	***	-0.15	***	0.08	**					
(8) Disliking	-0.04	n.s	0.16	***	-0.04	n.s	0.10	**	0.00	n.s					
(9) Upward 1↑	0.10	**	-0.05	n.s	0.07	*	-0.01	n.s	0.08	*					
(10) Downward 1↓	-0.01	n.s	0.09	**	-0.07	*	0.05	n.s	-0.09	**					
(11) InconsistencyUp↑	0.10	**	-0.06	*	0.07	*	-0.05	n.s	0.09	**					
(12) InconsistencyDown↓	-0.05	n.s	0.09	**	-0.07	*	0.12	***	-0.06	*					
(13) SES	0.36	***	-0.42	***	0.57	***	-0.41	***	0.44	***					
(14) Status	0.08	**	-0.04	n.s	0.16	***	-0.03	n.s	0.08	*					
(15) Gender	0.04	n.s	0.04	n.s	0.07	*	0.00	n.s	0.06	n.s					

*p < 0.05; ** p < 0.01; ***p < 0.001

Note: indegree and outdegree are continuous variables, based on proportions. Pearson correlations were calculated. Control variables are categorical. We calculated Spearman correlations.

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Table 5b
Correlations of the main variables in waves 1-2

	-6	-7	-8	-9	-10	-11
<i>Indegree</i>						
(1) Friendship						
(2) Disliking						
(3) Upward 1↑						
(4) Downward 1↓						
(5) InconsistencyUp						
(6) InconsistencyDown						
<i>Outdegree</i>						
(7) Friendship	-0.07 *					
(8) Disliking		-0.07 *				
(9) Upward 1↑	-0.06 *	0.16 ***	-0.03			
(10) Downward 1↓	0.06 n.s	-0.01 n.s	0.37 ***	0.12 ***		
(11) InconsistencyUp↑	-0.06 *	0.12 ***	0.00 n.s	0.77 ***	0.11 ***	
(12) InconsistencyDown↓	0.02 n.s	-0.01 n.s	0.31 ***	0.12 ***	0.83 ***	0.15 ***
(13) SES	-0.39 ***	0.10 **	-0.01 n.s	-0.06 n.s	0.02 n.s	-0.03 n.s
(14) Status	-0.11 ***	0.07 *	-0.08 **	0.02 n.s	0.01 n.s	-0.02 n.s
(15) Gender	-0.07 *	-0.01 n.s	0.09 **	-0.04 n.s	-0.05 n.s	-0.03 n.s

*p < 0.05; ** p<0.01; ***p<0.001

Note: indegree and outdegree are continuous variables, based on proportions. Pearson correlations were calculated. Control variables are categorical. We calculated Spearman correlations.

Table 6a
 Results for the SIENA meta-analysis (N=585)

	<i>Model 1</i>				<i>Model 2</i>			
	Est.	SE	σ	N	Est.	SE	σ	N
<i>Disliking network</i>								
(1) Rate (period 1)	8.24	0.63	0.00	10	8.60	0.69	1.09	13
(2) Rate (period 2)	8.85	0.65	1.15 +	15	8.67	0.67	1.24 +	13
(3) Density	-1.42 ***	0.08	0.16	15	-1.42 ***	0.08	0.17	15
(4) Reciprocity	0.50 ***	0.09	0.00	16	0.52 ***	0.08	0.00	16
(5) Transitive triplets	-0.03	0.04	0.08	16	-0.01	0.04	0.07	16
(6) 3-cycles	-0.15 **	0.05	0.00	15	-0.16 **	0.05	0.00	14
(7) Indegree popularity	0.09 ***	0.01	0.03 *	16	0.09 ***	0.01	0.03 +	16
(8) Outdegree popularity	0.03	0.02	0.00	15	0.03	0.02	0.00	15
(9) Outdegree isolate	-3.13 ***	0.15	0.00	15	-3.07 ***	0.15	0.00	15
(10) Upward 1 \uparrow (H1)					0.00	0.12	0.00	15
(11) Downward 1 \downarrow (H2)					0.20 *	0.08	0.00	16
(12) InconsistencyUp (H3)					0.13 *	0.06	0.00	16
(13) Inconsistencydown (H4)					0.22 **	0.07	0.10	16
(14) Aggregated Status Ego	-0.07 **	0.03	0.06 +	16	-0.08 **	0.03	0.06 +	16
(15) Aggregated Status Alter	-0.09 ***	0.02	0.02	16	-0.07 ***	0.02	0.00	16
(16) Aggregated Status Similarity	-0.06	0.07	0.13	16	-0.05	0.06	0.10	16
(17) SES Ego	0.04	0.05	0.08 +	16	0.02	0.04	0.07 +	16
(18) SES Alter	0.09 +	0.05	0.10	16	0.10 *	0.05	0.07	16
(19) SES Similarity	-0.11 +	0.06	0.00	16	-0.09	0.06	0.00	16
(20) Gender Ego	0.04	0.08	0.16	15	0.06	0.08	0.14	15
(21) Gender Alter	0.06	0.07	0.09	15	0.05	0.06	0.00	15
(22) Same Gender	0.11 +	0.07	0.12	15	0.11 +	0.06	0.10	15
(23) Friends agreement on disliking	0.17 ***	0.04	0.07	16	0.18 ***	0.04	0.06	16

+ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001

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Table 6b
Results for the SIENA meta-analysis (N=585)

	Model 1					Model 2				
	Est.	SE	σ	N		Est.	SE	σ	N	
<i>Friendship network</i>										
(24) Rate (period 1)	11.65 ***	1.08	3.69 ***	15		11.69 ***	1.12	3.74 ***	14	
(25) Rate (period 2)	10.01 ***	0.70	1.89 **	14		10.15 ***	0.75	2.07 ***	14	
(26) Density	-1.46 ***	0.11	0.25 +	16		-1.45 ***	0.11	0.25 *	15	
(27) Reciprocity	1.76 ***	0.09	0.23 **	15		1.75 ***	0.09	0.24 **	15	
(28) Transitive triplets	0.25 ***	0.02	0.06 ***	15		0.24 ***	0.02	0.06 ***	15	
(29) 3-cycles	-0.04	0.02	0.00	15		-0.03	0.02	0.00	15	
(30) Indegree popularity	0.01	0.01	0.03 *	15		0.01	0.01	0.03 *	15	
(31) Outdegree popularity	-0.15 ***	0.01	0.00	16		-0.15 ***	0.01	0.00	16	
(32) Outdegree isolate	2.84	2.02	7.44 ***	14		3.41	2.34	8.65 ***	14	
(33) Upward 1↑						0.36 ***	0.06	0.00	16	
(34) Downward 1↓						-0.38 **	0.14	0.00	15	
(35) InconsistencyUp						0.11 *	0.05	0.07	16	
(36) InconsistencyDown						-0.22 *	0.10	0.20 +	16	
(37) Aggregated status ego	-0.06 ***	0.02	0.00	16		-0.07 ***	0.02	0.00	16	
(38) Aggregated status alter	0.07 **	0.02	0.05 *	16		0.05 *	0.02	0.06 *	16	
(39) Aggregated status similarity	0.04	0.05	0.06	16		0.03	0.05	0.04	16	
(40) SES ego	0.05	0.05	0.12 *	16		0.07	0.05	0.11 *	16	
(41) SES alter	0.01	0.03	0.00	15		0.00	0.03	0.00	16	
(42) SES similarity	0.06	0.06	0.11 +	16		0.07	0.06	0.14 +	16	
(43) Gender ego	-0.05	0.07	0.18 *	16		-0.04	0.07	0.20 **	16	
(44) Gender alter	-0.20 ***	0.05	0.09	15		-0.20 ***	0.05	0.06	16	
(45) Same gender	0.35 ***	0.04	0.00	15		0.34 ***	0.04	0.00	16	
(46) Disliking agreement on friendship	0.07 *	0.03	0.00	16		0.07 *	0.03	0.00	16	

+ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001