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Master's thesis

The Effect of Popularity on Adolescent Romantic Relationships

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The Effect of Popularity on Adolescent Romantic Relationships

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Abstract

Two major concerns in adolescents' lives are popularity and romantic relationships. This study focuses on how popularity affects the propensity of adolescent romantic relationships, that is whether popularity increases chances of dating and number of dating episodes and how those effects change with the inclusion of other characteristics related to popularity, such as physical maturition, physical attractiveness, risk behavior, aggressive behavior, prosociality and unsupervised time spending. Results showed that popular adolescents were more prone to date, however, only age and gender predicted the number of dating episodes. There were also gender differences, for example, physical maturation was only important for boys, and not for girls.

Keywords: Adolescence; Romantic relationships; Popularity; Hurdle model.

The Effect of Popularity on Adolescent Romantic Relationships

Even though young people spend a great deal of time thinking about, talking about, and being in romantic relationships, for a long time adolescent dating has been dismissed as superficial (Furman & Shaffer, 2003; Collins, Welsh, & Furman, 2009). However, more and more scholars argue that these relationships play a pivotal role in the lives of adolescents (Feiring, 1996; Furman, 2002; Collins, 2003; Collins et al., 2009). For example, according Sullivan (1953), the establishment of romantic relationships during adolescence is one of the most important developmental tasks of that age. It not only influences the course of subsequent relationships but romantic relationships are also important for adolescents' autonomy development, identity status, intimacy skills and conflict management (Seiffge-Krenke & Connolly, 2010). Previous research has mostly focused on the outcomes of romantic relationships (Collins et al., 2009; Furman & Shaffer, 2003), the effects of family and parental relationships (Ivanova, Mills, & Veenstra, 2011; Overbeek et al., 2003) as well as psychological functioning of adolescents who start dating (Zimmer-Gembeck, Siebenbruner, & Collins, 2001). However, research investigating how peer-valued characteristics affect adolescents' romantic relationships is still scarce. Thus this study aims to fill the gap in the research on the determinants of the adolescent romantic relationships and answer the question "who dates?" with the focus on the peer context.

Besides dating, another major concern in adolescents' lives is popularity (Adler & Adler, 1998; Dijkstra, Cillesen, Lindenberg, & Veenstra, 2010). Popularity represents the social standing in the peer group and is an important aspect of peer relationships that influence adolescents' social and emotional development (Collins & Steinberg, 2007; Rubin, Bukowski, & Parker, 2007). The central aspect of popularity is the idea that the popular adolescent is attractive

to many and someone who peers in general want to hang out, affiliate, or associate with (Dijkstra et al., 2010).

Furthermore, popularity is known to be associated with other characteristics, such as physical development, physical attractiveness, athletic abilities, risk behavior, aggressive behavior, and prosociality (Adler & Adler, 1998; Dijkstra et al., 2009; 2010). One explanation is that these characteristics are related to popularity, because it shows peers that one can successfully bridge the maturity gap, referring to the discrepancy between biological and social maturation (Moffitt, 1993), by engaging in adult behaviors that underline maturation and autonomy (Dijkstra et al., 2010). Previous research showed that characteristics that affect popularity are also related to dating behavior (Ha, Overbeek, & Engels, 2009). For example, physical attractiveness (Furman & Winkles, 2010), risk behavior (Miller et al., 2009), intrasexual peer aggression (Gallup, O'Brien, & Wilson, 2011), mature appearances (Zimmer-Gembeck & Collins, 2008) increases chances of dating in adolescents. However, to our knowledge there has not been a study that incorporates all these characteristics into one model.

The aim of the current study is to investigate the effects of popularity on dating propensity. This study attempted to answer the following research question: *Does popularity increase chances of dating and number of dating episodes, and how other characteristics change this effect?* In addition, we also look to what extent this might differ for boys and girls*?*

Popularity and related characteristics

Increased interaction with cross-gender peers is one of the most noticeable developmental changes occurring in early adolescence. There is a developmental pathway from same-gender friendship groups before adolescence into the emergence of mixed-gender crowds in adolescence (Connolly et al., 2000; Connolly et al., 2004). Cross-gender friendships can serve as a conduit for heterosexual romantic relationships and, in fact, may result into romantic relationships in some

cases (Furman & Shaffer, 1999). Dating occurs along a continuum with youth typically progressing from involvement in mixed-gender peer group activities in early adolescence to group dating to finally dyadic dating outside of the group later in adolescence (Brown, 1999). Previous research hints to the direction that high status in the peer group may be a precursor to the establishment of early romantic relationships (Brown, 1999; Connolly et al., 2000). Popular adolescents are usually the first ones who become involved in the mixed-gender groups which create opportunities for heterosexual dating (Adler & Adler, 1998). Moreover, according to sexual selection theory, human mating is strategic and one seeks particular mates to solve specific adaptive problems (Buss & Schmitt, 1993). Popularity might increase the chances of success in the reproductive competition by signaling dominance and hierarchical standing in the group.

Higher standing among peers has been shown to be positively associated with the likelihood of having dating experience (Franzoi et al., 1994, Miller et al., 2009). Moreover, Brown (1999) presents the developmental pathway approach to analyze adolescence romantic relationships, arguing that social standing is of high importance in the emergence of the first romantic relationships. Popularity can affect one's ability to initiate and establish romantic relationship. This leads to the first hypothesis: *Popular adolescents are more likely to date than their less popular peers (H1).*

Furthermore, popularity is associated with various characteristics, such as physical attractiveness, athletic abilities, risk behavior, and prosocial behavior (Dijkstra et al., 2009). These are the "building blocks" of popularity. In addition, physical development and unsupervised time spending can be related to both popularity and dating. In relation to dating behavior, all mentioned characteristics can be divided into three conceptual blocks: *maturation*, *competition*, and *opportunity*.

Maturation

Physical changes associated with puberty are the central marker of the transition from childhood to adolescence. The appearance of adult characteristics becomes linked with expectations for adult behavior (Petersen et al., 1988). Moreover, biological maturation is associated with an increased interest in sexual behavior and romantic interests (Miller & Benson, 1999). Romantic interactions often begin to emerge with such interests. However, there are gender differences in pubertal timing: pubertal timing for girls starts earlier compared to boys. Thus it can be expected that in the middle adolescence, at the beginning of dating, girls are already quite mature, whereas there is more variability in physical development among boys. This leads to the second hypothesis: *Later physical development has negative effect on boys' dating propensity (H2a)*.

Next to physical development, physical attractiveness and athletic abilities can also signal maturation. They are in fact two sides of the same coin, and are both important in partner selection (Ha et al., 2010). Being good looking and sportive both represent health and reproductive success and can therefore signal maturation and increase attractiveness for cross-gender peers. According to Furman and Winkles (2010), physical appearance is related to the degree of causal and serious romantic involvement. Ha with colleagues (2010) investigated what characteristics in a partner increases dating desire. They found that attractiveness was the primary factor for boys' dating desire. For girls, however, it appeared that both attractiveness and social status of a potential partner were important for their dating desire (Ha et al., 2010). We hypothesize, that *physical attractiveness and athletic abilities increase chances of dating (H2b).*

Competition

There is a competition in the dating market for the most desired partners. Various behaviors increase ones chances of having a romantic relationship. From a developmental

perspective, it has been argued that adolescents face a discrepancy between their biological maturation and social opportunities to be fully acknowledged as adult, resulting in various strategies to overcome this "maturity gap" (Moffitt, 1993). According to Moffitt (1993) adolescent rule-breaking behavior serves as a means to establish one's "grown-up" status. Previous research showed that popular adolescents were indeed higher in risk behavior, which can be used to overcome the maturity gap (Dijkstra et al., 2009). Their successful way of dealing with the maturity gap might give popular adolescents an advantage in the competition with peers. Thus it might be the case that adolescents involved in rule breaking behavior have higher dating propensity. We hypothesize, that *risk behavior has a positive effect on dating propensity (H3).*

Earlier studies suggest that aggressive behavior is important in the initiation of romantic relationships (Gallup et al., 2011). If there is competition in the mating market, aggression against same-gender peers can be strategically used to increase reproductive chances (Griskevicius et al., 2009). We hypothesize, that *aggression has strong positive effect on dating propensity (H4).*

More positive behavior can also increase one's likeability and chances of dating. However, no clear direction of prosociality on romantic relationship initiation has been found in the literature. Popular adolescents are known to use both risk taking and prosocial behavior to achieve popularity (Dijkstra et al., 2009), and consequently increase chances of initiating romantic relationships. Thus it is important to control for the effect of prosocial behavior when predicting dating.

Opportunity and control variables

Opportunities for cross-gender interaction are not directly related to popularity, but are of great importance for dating. If adolescents spend a lot of time with their friends unsupervised by their parents, they have more opportunities to establish romantic relationships.

Additionally, social economic status (SES) could be directly or indirectly related to opportunities of dating. For example, adolescents who get more pocket money can spend them in dating activities (e.g. going to the movies, buying gifts). Or it might be that parents with higher SES can afford paying for their children's extracurricular activities and in this way increase their children's time spent outside home.

There are more determinants that effect adolescent romantic relationships. Previous research on adolescent romantic relationships has found that experiencing parental divorce speeds up the transition to the first romantic relationship (Ivanova et al., 2011). This is due to heightened sensitivity to stress during the transition period of adolescence. Therefore, it is important to control for a possible effect of parental divorce on adolescents' dating behavior.

In sum, we test the effect of popularity on adolescents' dating propensity as well as characteristics related to popularity. To understand why popularity is related to dating we test whether the predictive power of popularity on propensity to date is decreased by these characteristics.

Methods

Sample

Data were used from TRAILS (Tracking Adolescents' Individual Lives Survey). TRAILS is a prospective cohort study of Dutch adolescents who will be measured biennially from the age around 11 until they are at least 25 years old. TRAILS is designed to chart and explain the development of mental health and social development from preadolescence into adulthood (de Winter et al., 2005). It is a longitudinal study: the first wave (T1) took place in 2001-2002, the second wave (T2) was in 2003-2004, and the data for the third wave (T3) was gathered in 2005-2007. Details about the study are published elsewhere (Huisman et al., 2008; Winter et al., 2005).

The TRAILS target sample involved preadolescents living in five municipalities in the north of the Netherlands, including both urban and rural areas (De Winter et al., 2005). Of all children and parents approached for the participation in the TRAILS study 76.0% gave consent, which resulted in an initial sample of 2,230 participants (*M* age = 11.11; *SD* = 0.56).

During the second wave of data collection, *peer nominations* were assessed in classes with at least three regular TRAILS participants. Schools provided the names of classmates of TRAILS participants. All eligible students then received an information letter for themselves and their parents, in which they were asked to participate. If students or their parents wished to refrain from participation, they were requested to send a reply card within 10 days. Approximately two weeks after the information letter had been sent, a TRAILS staff member visited the selected school classes to assess the peer nominations. The assessment of the peer nominations lasted about 15 minutes and took place during regular lessons. Respondents could nominate an unlimited number of same-gender and cross-gender classmates in their responses to all questions. This resulted in a subsample with peer nominations from both TRAILS participants and their classmates, including 3,312 students from which 1,007 were TRAILS participants (*M* age = 13.60; *SD* = 0.66).

In the third wave of TRAILS the *Event History Calendar* (EHC) interviews were performed, during which the adolescents were asked to report important life events (e.g., the start and end of romantic relationships) on a detailed monthly calendar going back to the beginning of the TRAILS data collection (approximately 5 years). A total of 1,513 adolescents filled the EHC interview (*M* age = 16.25; *SD* = 0.67). For the purpose of our study we were interested in timing and number of romantic relationships of participants as derived from the EHC.

In the current study we used data from peer nominations and EHC. In total, we had for 724 respondents information about their dating behavior and peer nominations. 134 of those

respondents reported having their first romantic relationships before the second wave (early daters). Because the goal of this study is to test the effect of popularity on dating propensity, it is important that explanatory variables come before the outcome variable. In this way the inference about the effects of popularity on dating can be strengthened. It might be the case that not only popularity increases chances of dating, but that dating also increases popularity. In order to avoid bewilderment between dependent and independent variables, early daters were excluded, yielding the final sample of N = 590 adolescents (57% girls) who indicated dating after the second wave and had peer nomination data.

The target sample was compared with the early daters in order to see if there are any significant differences between both groups. Early daters were on average 12.70 (SD = .85) years old at the beginning of the first romantic relationship, whereas adolescents in the target sample reported first dating at the average age of 14.90 (SD = .90). An independent sample T-tests revealed that compared to the early daters, respondents in the target sample came from families with higher SES, $t(714) = 7.11$, $p < .05$, Cohen's $d = 0.35$ ($M_{\text{target}} = .21$, $SD = .77$; $M_{\text{early daters}} = -.06$, $SD = .78$), reported spending less unsupervised time, $t(157.96) = 7.13$, $p < .05$, Cohen's $d = -.59$ ($M_{\text{target}} = 0.70$, $SD = 0.80$; $M_{\text{early daters}} = 1.31$, $SD = 1.23$), and showed less externalizing problems, $t(159.45) = 2.87$, $p < .05$, Cohen's $d = -0.32$ ($M_{\text{target}} = .20$, $SD = .17$; $M_{\text{early daters}} = .26$, $SD = .20$). Comparison on the explanatory variables from the peer nomination data showed that compared to the early daters, selected participants were lower in popularity $t(175.46) = 4.02$, $p < .05$, Cohen's $d = -0.44$ ($M_{\text{target}} = .09$, $SD = .12$; $M_{\text{early daters}} = .15$, $SD = .15$), less physically developed $t(213.392) = 3.00$, $p = .03$, Cohen's $d = -0.28$ ($M_{\text{target}} = -0.02$, $SD = 1.01$; $M_{\text{early daters}} = 0.25$, $SD = 0.91$), scored higher on risk behavior $t(213.392) = 3.00$, $p = .03$, Cohen's $d = -0.28$ ($M_{\text{target}} = -0.02$, $SD = 1.01$; $M_{\text{early daters}} = 0.25$, $SD = 0.91$), but did not differ on prosociality.

Overall, these comparisons indicated that the target sample is somewhat biased with regard to the key variables, which should be kept in mind when interpreting the results.

In addition, we compared the target sample (N = 590) and the initial TRAILS sample at T1. Compared to the target sample, other TRAILS participants (N = 2,230 – 590 = 1,640) were more likely to be boys, $\chi^2(2,230) = 10.98$, $p < .05$ Cramer's $\varphi^2 = 0.07$, came from families with a lower socioeconomic status (SES), $t(2,188) = -9.49$, $p < .05$, Cohen's $d = -.46$ ($M_{others} = -.14$, $SD = .77$; $M_{target} = .21$, $SD = .79$), and reported more externalizing problems in T1, $t(1,208.95) = 1.97$, $p = .05$, Cohen's $d = .09$ ($M_{others} = .28$, $SD = .20$; $M_{target} = .26$, $SD = .17$).

Measures

Dating. During the EHC interviews adolescents were asked to report the timing of their romantic relationships (reported at the M age = 16.22). Our dating variable captured the number of dating episodes. Note that we do not have information whether respondents dated the same person for several occasions or whether each romantic relationship was with a different person. The purpose of using the number of romantic relationships as an outcome variable is twofold. First, it distinguishes non-daters (those who reported of not having romantic relationship) from daters (those who reported having one or more romantic relationships). Second, it enables to model the number of dating episodes as a function of various characteristics of interest. So it is possible to investigate whether specific characteristics increase chances of dating and if these characteristics also affect the number of dating episodes one has.

Peer nominations. Respondents were asked to nominate peers on the following characteristics: **popularity** ('Who do others want to be associated with?'), **physically attractiveness** ('Who is good looking?'), **athletic abilities** ('Who is good at sports?'), **risk behavior** ('Who drinks alcohol and/or takes (soft) drugs on a regular basis?' and 'Who breaks the rules often (e.g. steals things, demolishes a bus shelter)?'), **physical aggression** ('Who starts fights?'), **relational**

aggression ('Who spreads rumor/gossip about others?'), and **prosociality** ('Who helps you emotionally?' and 'Which classmates give you practical support (e.g., with homework)?'). The number of nominations received was divided by the total number of participating classmates, resulting in proportion scores ranging from 0 to 1.

Physical development. The stage of physical development was assessed at T2. Adolescents were asked to report the degree of their own pubertal change on a number of relevant characteristics (Petersen et al., 1988). All adolescents were asked to indicate whether they started experiencing the growth spurt, the growth of body hair (e.g., pubic hair), and changes in skin (e.g., pimples). Boys were also asked about the growth of their facial hair and changes in voice, whereas girls were asked about their breast growth and menstruation. Answers to these questions were combined (Cronbach's α for boys = .77, for girls = .74) and *z*-standardized within gender.

Unsupervised time spending. At T2 respondents were asked how many hours per day they spend on activities, such as watching TV and doing homework. Answer categories ran from 0 (none), 1 (half an hour), 2 (about an hour), 3 (about 2 hours), up to score 9 (about 8 hours) per day. The activities relevant to the current study were those which happen outside home without supervision by parents. These activities were 'spending time with friends on the street', 'spending time in youth centers', and 'going-out with friends'. The correlations between three types of unsupervised time-spending were moderate ($r > .32$, $p < .01$). For the sake of parsimony, we aggregated these scores into one variable indicating the approximate amount of unsupervised time spending

Socioeconomic status. The family's SES was assessed at T1, based on the education and occupational levels of both parents and the family income level. SES was measured as the average of the five items, which were standardized to $M = 0$ and $SD = 1$. The measurement captured 61.2% of the variance in five items with high internal reliability (Cronbach's α of .84).

***Parental divorce*.** During EHC interviews adolescents were asked to report the date when their parents got divorced (if the case). The dummy variable was computed yielding 1 if the respondent experienced parental divorce before the date of peer nomination assessment (*M* age 13.41).

Age at EHC interview. We also controlled for age at the interview of EHC, ranging from 14.8 to 18.0, to account for differences in the recall period of dating history.

Analytical strategy

A series of generalized linear models were tested in order to investigate whether popularity predicted dating, and how this association changed with the addition of other covariates related to popularity. Due to specifics of the outcome variable, the hurdle regression model was used, which is able to incorporate over-dispersion and excess zeros - two problems that typically occur in count data (Zeileis, Kleiber & Jackman, 2008). The hurdle model consists of two parts. First, it models zero versus larger counts using a hurdle component (never in a romantic relationship versus in a romantic relationship). Second, for positive counts it employs a truncated count component, in this case binomial probability. By comparing daters and non-daters a hurdle model reveals the same results as logistic regression. In addition, a truncated count component reveals whether the same determinants affect the number of dating episodes for daters. The general concept underlying the hurdle model is that a binomial probability model governs the binary outcome of whether a count variable has a zero or a positive value. If the value is positive (i.e., in a romantic relationship), the 'hurdle' is crossed, with the conditional distribution of the positive values governed by a zero-truncated count model.

Initially, a basic model was fitted, which included control variables (i.e., gender, age, and divorce) and the main predictor (i.e., popularity). Afterwards, each "building block" of popularity was added separately in order to see to what extent the effect of popularity changed.

Lastly, the full and parsimonious models were fitted, yielding nine models overall. Interactions with gender were added to the models in order to test gender differences in dating propensity. However, only one significant interaction effect was found, and therefore left in the final models. All of the analyses were carried out using the R version 2.12.2.

Results

Descriptive statistics

Half of the respondents (51.4%) indicated that they had at least one romantic relationship between T2 and T3: 57.4% of girls and 43% of boys indicated dating. The mean age at the start of the first romantic relationship was 14.90 (*SD* = .90), ranging from the age of 12.91 to the age of 17.57. With regard to the number of dating episodes, two respondents indicated having 5 and 6 romantic relationships, whereas 29.8% of the sample reported only one romantic relationship, and 15.8% - two romantic relationships.

Table 1 shows the descriptive statistics of the explanatory and control variables used in this study. After comparing the mean and the median it was visible that some of the variables, e.g. popularity, physical attractiveness, athletic abilities, and unsupervised time were positively skewed (skewed to the right, when the median is smaller than mean). For the peer nomination variables this was due to the nature of the measure, that is, a lot of respondents did not receive any nomination for certain questions. The maximum value of popularity was 0.65, meaning that no one was indicated as being popular by all classmates. More than a third of respondents (37.8%) were not considered as being popular by their peers (popularity score = 0). For the physical attractiveness and athletic abilities the scores were a bit higher, as well as for prosocial behavior. The propensity of risk behavior was low with 63.9% of respondents scoring 0, which means that their peers did not indicate them as people who break rules, drink alcohol and/or use drugs. The average age at the EHC interview was 16.22, with 80% ranging between age 15.5 and

17.0. As it was mentioned before, the variability in age at the EHC interview was quite substantial and could have an effect on dating propensity, because older adolescents had more opportunities, that is, more time, to initiate a romantic relationship. The positive mean of SES indicated that sample contained quite a big proportion of respondents from higher SES families.

---------- TABLE 1 ----------

Table 2 shows the correlations between covariates for girls and boys. As expected, popularity was correlated with all peer-nomination variables in a positive direction. In other words, higher popularity scores were correlated with higher physical attractiveness and athletic abilities, more risk behavior as well as more prosocial behavior. The strongest correlation was between popularity and physical attractiveness both for males (r = .46) and females (r = .50). Also popularity correlated positively with unsupervised time spending. The latter was also moderately correlated with risk behavior, which was twice as strong for girls compared to boys. Physical attractiveness was correlated with athletic abilities and prosocial behavior for both genders. Finally, there was a gender difference in the association between risk behavior and prosociality: although not significant, the correlation was positive for girls (r = .07) and negative for boys (-.13). This seems to indicate that girls in the sample were more controversial than boys by being both risk taking and prosocial.

---------- TABLE 2 ----------

Furthermore, in order to see if there were differences between daters and non-daters, and between boys and girls, a series of two-way ANOVA were performed. Table 3 shows the group

means for every covariate and effect sizes of the ANOVA. Almost all covariates differed significantly for daters and non-daters. Compared to non-daters, daters were older (at EHC interview), from lower SES families, and scored higher on popularity, physical attractiveness, and risk behavior, and spent more time unsupervised. In line with the second hypothesis, there was a significant interaction term for physical development, which meant that it became important in the combination of gender and dating. In other words, boys who date were significantly more mature than non-dating boys. Additionally, athletic abilities, physical attractiveness, and prosocial behavior differed significantly within gender with boys having a higher mean for the first covariate and girls scoring higher on the latter ones. These results hinted to the expected direction: popularity was higher for daters, gender had a moderating effect in physical development, daters and girls scored higher on physical attractiveness, whereas boys scored higher on athletic abilities. What is more, daters were more involved in risk behavior, but did not differ on prosociality. Lastly, daters spent more unsupervised time compared to non-daters. To summarize, the selected parameters seem to be important to be included in the following analysis.

---------- TABLE 3 ----------

Count data analysis

The next step was to see how the propensity to date could be predicted by explanatory and control variables. The forward selection strategy was used in order to see how inclusion of each covariate changes the main effect of popularity. First, the core model was estimated, consisting of all covariates together with the main explanatory variable, i.e. popularity. In the next steps each covariate was added separately to the model together with the interactions with gender (not

presented here). For the final model only covariates and interaction terms that in the previous steps were statistically significant were selected. Table 4 shows the results of the models.

The first part of table 4 shows the results of the zero hurdle models which indicate the effect sizes in predicting whether an adolescent has a romantic relationship or not. The second part of table 4 shows the estimates of the count models indicating which covariates were significant in predicting the number of dating episodes.

First, the results of the zero hurdle part of both models will be discussed. In line with the first hypothesis, popularity had a statistically significant positive effect on dating propensity (B = 3.40, $p < .05$). However, the effect of popularity became 44% smaller (in final model B = 1.91, $p < .05$) when other explanatory variables were added to the model. This indicated that a reasonable proportion of its variation is explained by other explanatory variables. Particularly physical attractiveness, risk behavior and unsupervised time spending had a significantly positive effect on dating. Prosocial behavior however decreased chances of dating, but only for girls. For boys there was no effect. Hence, our findings on the positive effects of risk behavior on dating propensity were in line with hypothesis *3*. Neither physical nor relational aggression had a significant effect on dating.

Another goal of this study was to test whether there were different underlying mechanisms for boys and girls when predicting dating. First, the main effect of gender is almost identical in both core and final models in the zero hurdle part. It indicates that boys had a lower chance of having a romantic relationship compared to girls. In order to test our hypothesis about the moderating effect of gender on our three maturity measures, interaction terms were added to the intermediate logistic regression models. It appeared that only the interaction term between gender and physical development was statistically significant and thus left in the final model.

This is consistent with hypothesis *2a*, but not with hypothesis *2b*. Gender did not have any moderating effect on physical attractiveness or on athletic abilities.

Additionally, only physical attractiveness had a significant main effect in the final model from all three maturity measures (i.e. physical development and athletic abilities did not have statistically significant effects on dating propensity), showing that higher physical development for boys increased chances of dating. Girls at this age are already quite physically developed, whereas boys have bigger variation in physical development.

Moreover, the effect of prosocial behavior was moderated by gender in the zero hurdle part of the final model. The main effect of prosociality was negative, however, the interaction term between gender and prosociality had a positive effect on dating. This means that for boys prosocial behavior had negative effect on the likelihood of dating whereas for girls the effect became positive. The interaction between prosociality and risk behavior was also tested (not presented here).

---------- TABLE 4 ----------

The second part of the table 4 shows the estimates of the count model. It indicates the effect covariates predicting the number of dating episodes for daters, answering the question to what extent popular adolescents have more romantic relationships than their less popular peers? Results show that only age and gender had significant effect on the number of romantic relationships. Once again, boys seemed to have less dating episodes compared to girls (in final model $B = 0.51$, $p < .05$); and adolescents who were older at the EHC interviews had more dating episodes than their younger peers (in the final model $B = 0.23$, $p < .05$).

In order to facilitate the interpretation of the effect sizes, the odds ratios were added to the Table 4. Because peer-nomination variables vary from 0 to1, it is not sensible to interpret the increase of dating propensity with the increase of one unit of the peer-nomination covariate. In order to get interpretable odds, the exponent was taken from a twentieth of the effect size of peer-nomination covariates (because classrooms consist of approximately 20 students). Therefore, *Exp(B)* indicates the increase of an effect size with the five per cent increase in the particular peer-nomination score, which on average corresponds to the addition of one nomination (in other words, how the effect changes by receiving additional nomination for a particular question).

In the core model popularity had the strongest effect – the likelihood of dating increased by 1.19 with the increase of five percent of the popularity score. However, with the addition of other covariates the odds of dating increased only by 8% with the increase of five percent of the popularity score, i.e. with the additional nomination in popularity.

The intercept in the final model indicated that the probability of not dating is 44% for girls, and participants who did not experience parental divorce, with a mean SES, a mean age at EHC, with mean popularity and mean in other covariates. The final model showed that the odds of dating for boys were 41% lower than for girls. The interaction terms suggested that for boys an increase of one unit in physical development increased the odd of dating almost twice; and an increase in five per cent of prosociality increased the odds of dating by 23%.

Discussion

This study aimed to investigate the determinants of dating in adolescence. The study performed a hurdle regression analysis on a subsample taken from three waves of TRAILS data, which comprised general information about respondents, and data from peer nominations and EHC interviews. The results showed that half of the respondents had been dating in the observed

period of time. This is in line with other researches on prevalence of dating (Friedlander et al., 2003).

The analysis of the zero hurdle models, which corresponds to a logistic regression model, showed that popularity has a significant positive effect on dating propensity. Popular adolescents were more likely to date than their less popular peers. The significance of popularity might increase due to "selective partnering" (Collins, 2003). According to Buss and Schmitt (1993), human mating is strategic by seeking similarity, equity, and complementarity. Simon et al. (2008) found that prior to their relationship adolescents and partners were significantly alike on popularity and physical attractiveness. This would explain the selective partnering – popular adolescents seek to date other popular adolescents, thus if one is popular, ones chances to date increase substantially. However, the effect of popularity decreased when related characteristics were added to the model. This is due to the multicolinearity between covariates and builds on previous research (Dijkstra et al., 2009).

Popularity is related to other characteristics that signal maturity and facilitate the competition in a dating market. For example, physical attractiveness, which was correlated with popularity, increased likelihood of dating. However, athletic abilities and physical development did not show significant main effects in predicting dating. The interaction effect between gender and physical development revealed that, more physically developed boys had higher chances of having romantic relationships compared to their less matured male peers. For girls, this was not the case. Additionally, holding all other covariates constant, physical attractiveness had a statistically significant positive effect on dating propensity. This is in line with previous research emphasizing the importance of looks for both popularity and dating initiation (Ha et al., 2010, Simon et al., 2008).

It was argued that risk taking behavior also helps overcoming the maturity gap and therefore might increase chances of dating. Our findings were in line with this. Additionally, it was found that unsupervised time spending increased chances of having romantic relationship. Moreover, the relation between unsupervised time spending and risk taking behavior was stronger for girls than for boys. The speculative explanation might be that girls are more monitored by their parents compared to boys, and thus spend less time unsupervised reducing the opportunities for risk-taking behavior.

In the core model of zero hurdle regression part only divorce did not have a statistically significant effect on dating propensity. It might be the case that this measure distinguished between adolescents who had and had not experienced parental divorce before the assessment of peer nominations, but did not indicate if parental divorce happened between age 11 and 13. Previous research showed that adolescents in this age interval have heightened sensitivity and thus are more affected by changes in their family structure. However, in the current sample there were only 8 respondents who experienced parental divorce at that age (too small group to be included in the analysis separately), and 79 respondents were younger than 11 when their parents got divorced. Thus it might be the case that experiencing parental divorce in the younger age does not trigger the initiation of the romantic relationship.

With regard to the number of dating episodes, a count model part in the hurdle regression revealed that only age and gender had significant effects on the occurrence of the romantic relationships.

There were several unexpected findings. First, prosociality was negatively associated with dating propensity for girls, whereas for boys prosociality was unrelated to the likelihood of dating. It might be the case that girls value prosocial behavior in boys, whereas for boys prosocial behavior does not matter in the selection of a dating partner. However, further

investigation is needed into the role of prosociality in dating. A more precise measure of same-gender and other-gender prosociality might enlighten whether being prosocial with the same-gender peers has the same effect as being prosocial with other-gender peers. In a similar way, neither physical nor relational aggression did not have effect in dating, which might also be due to the fact that the aggression measure did not differentiate between same-gender and other-gender aggression. Second, SES showed a negative effect on dating. It could be speculated that dating is associated with a risk taking behavior and adolescents from lower SES are more prone to that kind of behavior.

One of the aims of this study was to test whether there were different underlying mechanisms of dating for boys and girls. Various interactions between covariates and gender were tested, however, only two that were mentioned above, i.e. interaction with physical development and prosociality, were found significant. This suggests that similar mechanisms come into play for both boys and girls when predicting dating.

The strength of this study is the use of large sample, allowing finding at least medium effect sizes (Cohen, 1992). The generalizability of our findings is however somewhat limited. The analyzed sample represents adolescents from the North of the Netherlands, which is known to be less ethnically heterogeneous and more rural than the rest of the Netherlands. According to Brown (1999), dating behavior is culturally dependable, meaning that what is normal in one county might not be appropriate in another (it could even be true for rural and urban areas). Cultural norms strongly influence the degree and timing of romantic involvement (Miller & Benson, 1999; Furman & Winkles, 2010) and might also influence which characteristics are valued and contribute to popularity among peers.

This study did not look at the effect of dating on popularity. Previous research showed the dual relationship between social standing and dating behavior by selection and socialization

processes (Simon et al., 2008). It might be the case that dating is a desirable activity because it increases popularity among peers (socialization). In order to examine this effects information on both adolescents and their romantic partners is needed.

To summarize, this study investigated the relation between adolescent's popularity and dating propensity taking into account peer context. This study is the first to test relations between popularity and dating in this configuration and gave further insight into underlying mechanisms of adolescents' dating behavior. Popularity increased chances of dating however did not affect the number of dating episodes.

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Table 1

Descriptive Statistics of Independent Variables

Variable	Min. value	Max. value	Median	Mean	SD
Age at EHC interview	14.80	18.01	16.13	16.22	0.60
SES	-1.73	1.74	0.27	0.21	0.77
Popularity	0.00	0.65	0.05	0.09	0.12
Physical development	-3.21	2.30	0.14	-0.02	1.01
Physical attractiveness	0	1	0.13	0.19	0.20
Athletic abilities	0	1	0.22	0.29	0.26
Physical aggression	0	1	0	0.05	0.12
Relational aggression	0	0.75	0.08	0.12	0.14
Risk behavior	0	0.56	0	0.03	0.07
Prosociality	0	0.58	0.17	0.17	0.10
Unsupervised time	0	5.76	0.48	0.70	0.80

		Frequencies (%)		
Gender	Girls	334 (57%)	Boys	256 (43%)
Parental divorce	Not divorced	503 (85%)	Divorced	87 (15%)
Dating	Non-daters	287 (49%)	Daters	303 (51%)
Number of romantic relationships (for daters)	1	176 (58.1%)		
	2	93 (30.7%)		
	3	27 (8.9%)		
	4	5 (1.7%)		
	5	1 (0.3%)		
	6	1 (0.3%)		

Table 2

Correlations between Study Variables

		1	2	3	4	5	6	7	8	9	10	11
1	Age at EHC interview	–	-.01	.08	.19	-.05	*.03*	.11	.11	.01	-.08	.07
2	SES	-.09	–	.04	-.15	.10	.04	-.08	*-.32*	-.13	.12	-.23
3	Popularity	.06	-.06	–	-.03	.46	.38	.27	.27	.30	.17	.26
4	Physical development	.17	-.03	.02	–	-.04	-.07	.14	.04	.02	-.04	.16
5	Physical attractiveness	.00	-.01	.50	.09	–	.49	.11	.08	.14	.32	.08
6	Athletic abilities	*-.15*	.01	.30	-.06	.44	–	.16	*.21*	.13	.27	.16
7	Risk behavior	.17	-.21	.30	.07	.22	.02	–	*.43*	.16	*-.13*	*.23*
8	Physical aggression	.15	*-.13*	.29	-.04	.04	*.03*	*.28*	–	.39	-.14	.22
9	Relational aggression	.17	-.08	.42	.02	.19	.09	.26	.44	–	-.02	.14
10	Prosociality	-.02	.03	.27	.01	.44	.35	*.07*	-.02	.06	–	-.02
11	Unsupervised time	.19	-.26	.18	.07	.04	.03	*.46*	0.11	.12	.59	–

Note. Correlations for boys (n=251) above and girls (n=326) below the diagonal; $r > |.17|$, $p < .01$*;*
Italics - significant gender differences (Fisher z), $p < .05$ (two-tailed).

Table 3

Differences between Boys and Girls and Daters and Non-Daters on the Study Variables

	Estimates (SE)			
Independent variables	Intercept	Gender	Dating	Gender×Dating
Age at EHC interview	16.11 (0.05)**	0.05 (0.05)	0.21 (0.07)**	-0.05 (0.10)
SES	0.37 (0.06)**	-0.08 (0.09)	-0.28 (0.08)**	0.11 (0.13)
Popularity	0.07 (0.01)**	-0.01 (0.01)	0.05 (0.01)**	-0.01 (0.02)
Physical development	-0.08 (0.08)	-0.17 (0.12)	0.10 (0.11)	0.43 (0.17)*
Physical attractiveness	0.22 (0.02)**	-0.12 (0.02)**	0.07 (0.02)**	-0.03 (0.03)
Athletic abilities	0.21 (0.02)**	0.14 (0.03)**	0.02 (0.03)	0.06 (0.04)
Risk behavior	0.01 (0.01)	0.01 (0.01)	0.03 (0.01)**	0.01 (0.01)
Physical aggression	0.01 (0.01)	0.05 (0.01)**	0.02 (0.01)	0.04 (0.02)*
Relational aggression	0.13 (0.01)**	-0.06 (0.02)**	0.06 (0.01)**	-0.04 (0.02)
Prosociality	0.20 (0.01)**	-0.06 (0.01)**	-0.01 (0.01)	0.01 (0.02)
Unsupervised time	0.44 (0.06)**	0.12 (0.09)	0.44 (0.09)**	-0.07 (0.13)

Note. * $p < .05$; ** $p < .01$. Gender is coded as 0 = girls and 1 = boys.

Table 4

Zero Hurdle Model Analyses (Binomial with Logit Link) on Whether or Not an Adolescent Has Had a Romantic Relationship

	Basic model			**Maturity model**			**Risk model**			**Aggression model**			**Prosociality model**			**Unsupervised time model**			**Full model**			**Parsimonious model**		
	B	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
Intercept	-7.61**	2.42		-7.34**	2.52		-6.83**	2.46		-7.27**	2.45		-7.20**	2.44		-7.30**	2.49		-5.97*	2.65		-6.00*	2.62	
SES	-.34**	.12	0.72	-.32**	.12	0.72	-.29*	.12	0.75	-.28*	.12	0.75	-.34**	.12	0.72	-.26*	.12	0.77	-.20	.13	0.82	-.23*	.13	0.77
Age at EHC interview	.47**	.15	1.60	.44**	.15	1.55	.42**	.15	1.52	.44**	.15	1.55	.47**	.15	1.60	.43**	.15	1.54	.36*	.16	1.44	.37*	.16	1.45
Parental divorce	.47	.26	1.60	.57*	.27	1.76	.46	.26	1.59	.47	.26	1.60	.43	.26	1.54	.43	.27	1.54	.43	.28	1.54			
Gender (male)	-.55**	.18	0.57	-.48*	.22	0.62	-.63**	.18	0.53	-.56**	.20	0.57	-.98**	.38	0.38	-.57**	.18	0.57	-1.30**	.42	0.27	-1.31**	.40	0.27
Popularity	.17**	.04	1.19	.13**	.04	1.14	.14**	.04	1.15	.14**	.04	1.15	.18**	.04	1.20	.15**	.04	1.16	.08	.05	1.08	.10*	.05	1.10
Physical development				.03	.12	1.03													.03	.12	1.03	.03	.12	1.03
Physical development × gender				.48**	.18	1.61													.43*	.19	1.53	.42*	.19	1.52
Physical attractiveness				.87	.56	2.38													.08*	.03	1.08	.08**	.03	1.08
Athletic abilities				.36	.40	1.43													.01	.02	1.01			
Risk behavior							.32**	.10	1.38										.17	.10	1.19	.21*	.10	1.24
Physical aggressions										.07	.05	1.07							.05	.05	1.05			
Relational aggressions										.05	.04	1.05							.04	.04	1.04			
Prosociality													-.10	.06	0.90				-.19**	.07	0.83	-.20**	.07	0.82
Prosociality × gender													.11	.10	1.11				.22*	.11	1.25	.23*	.11	1.26
Unsupervised time																.60**	.14	1.82	.53**	.15	1.70	.55**	.15	1.74
Log-likelihood	-669.10			-651.30			-662.20			-666.20			-667.50			-648.70			-629.10			-632.70		
df	13			21			15			17			17			15			33			25		
AIC	1364.16			1344.52			1354.43			1366.46			1369.00			1327.35			1324.21			1315.46		
N	585			581			585			585			585			577			577			577		

Note: *OR* = Odds Ratio (e^b); *p < .05. **p < .01.

Table 4 (*continuation*)

Count Model Analyses (Truncated Negative Binomial with Log Link) on the Number of Dating Episodes

	Basic model			**Maturity model**			**Risk model**			**Aggression model**			**Prosociality model**			**Unsupervised time model**			**Full model**			**Parsimonious model**		
	B	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*	*B*	*SE*	*IRR*
Intercept	-3.72*	1.61		-4.17*	1.68		-3.67*	1.62		-3.57*	1.63		-3.71*	1.65		-3.46*	1.62		-3.58*	1.73		-3.46*	1.71	
SES	.06	.10	1.06	.07	.10	1.07	.06	.10	1.07	.07	.10	1.07	.06	.10	1.06	.07	.10	1.07	.09	.11	1.09	.07	.10	1.07
Age at EHC interview	.23*	.10	1.26	.25*	.10	1.29	.23*	.10	1.26	.22*	.10	1.25	.23*	.10	1.26	.21*	.10	1.24	.22*	.10	1.24	.22*	.10	1.24
Parental divorce	.09	.18	1.09	.10	.18	1.11	.09	.18	1.09	.09	.18	1.10	.09	.18	1.09	.06	.18	1.07	.08	.18	1.09			
Gender (male)	-.52**	.17	0.59	-.53*	.21	0.59	-.53**	.17	0.59	-.54**	.20	0.59	-.69	.36	0.50	-.53**	.17	0.59	-.79	.41	0.46	-.65	.37	0.52
Popularity	.00	.03	1.00	-.02	.03	0.98	.00	.03	1.00	-.01	.03	0.99	.00	.03	1.00	-.01	.03	0.99	-.04	.03	0.96	-.03	.03	0.97
Physical development				.15	.10	1.16													.15	.10	1.16	.13	.10	1.14
Physical development × gender				-.28	.17	0.75													-.27	.17	0.77	-.28	.17	0.76
Physical attractiveness				.19	.38	1.21													.02	.02	1.02	.02	.02	1.02
Athletic abilities				.40	.34	1.49													.02	.02	1.02			
Risk behavior							.01	.05	1.01										.00	.05	1.00	.00	.05	1.00
Physical aggressions										.02	.03	1.02							.02	.04	1.02			
Relational aggressions										.01	.03	1.01							.01	.03	1.01			
Prosociality													-.01	.04	0.99				-.03	.05	0.97	-.03	.05	0.97
Prosociality × gender													.06	.10	1.06				.08	.11	1.08	.07	.10	1.07
Unsupervised time																.09	.08	1.09	.08	.08	1.08	.08	.08	1.09
Log-likelihood	-669.10			-651.30			-662.20			-666.20			-667.50			-648.70			-629.10			-632.70		
df	13			21			15			17			17			15			33			25		
AIC	1364.16			1344.52			1354.43			1366.46			1369.00			1327.35			1324.21			1315.46		
N	585			581			585			585			585			577			577			577		

Note: *IRR* = Incidence Rate Ratios (e^b); *p < .05. **p < .01.