Journal of Adolescence 36 (2013) 925–933

Contents lists available at ScienceDirect

Journal of Adolescence

journal homepage: www.elsevier.com/locate/jado

Extrinsic relative to intrinsic goal pursuits and peer dynamics: Selection and influence processes among adolescents

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Keywords:
Goals
Values
Peer similarity
Peer selection
Peer influence

A B S T R A C T

Self-Determination Theory discerns goals and values in terms of whether they are intrinsic or extrinsic in nature. Although research substantiates the importance of goal preferences for a host of outcomes, few studies examined how such preferences develop, and studies that did pay attention to this focused on parental influence processes. The present study focuses on the role of peers. Social network analyses on longitudinal data gathered among senior high-school students ($N = 695$) confirm that peer similarity in goal pursuit exists, and that, although this similarity partly originates from adolescents selecting friends on the basis of perceived goal pursuit similarity, it also results from peers actively influencing each other. Hence, friends tend to become more alike in terms of goal pursuit over time. Data also suggest that, although changes in goal pursuit at this age can be predicted from peer dynamics, they cannot be attributed to parental goal promotion efforts.
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Goal-Content Theory, one of the five mini-theories of Self-Determination Theory (Deci & Ryan, 2000; Vansteenkiste, Niemiec, & Soenens, 2010), discerns the goals people pursue and the values they hold in terms of whether they are intrinsic or extrinsic in nature (Kasser & Ryan, 1996). Intrinsic goals such as self-development, affiliation, and community contribution would be inherently satisfying to pursue because they are focused on the human self-actualization tendency. In contrast, extrinsic goals such as financial success, physical attractiveness, and social popularity would be at odds with one's personal interests and potential, and would be directed at external indicators of worth (e.g., wealth or fame) instead (Vansteenkiste, Soenens, & Duriez, 2008). According to Goal-Content Theory, the valuation of extrinsic goals is not problematic as such, but becomes problematic when extrinsic goals are too central within a person's value-system (Sheldon & Kasser, 2008). In line with this idea, a high valuation of extrinsic relative to intrinsic goals was found to relate negatively to well-being indices such as self-esteem and life satisfaction, and positively to ill-being indices such as anxiety and depression (Kasser, 2002; Sheldon & Kasser, 2008; Vansteenkiste et al., 2008). In addition, a relatively more extrinsic goal pursuit was found to relate to poorer academic performance (Tabachnick, Miller, & Relyea, 2008; Vansteenkiste, Lens, & Deci, 2006), less persistence in physical exercising (Sebire, Standage, & Vansteenkiste, 2009) and bulimic symptoms (Verstuyf, Vansteenkiste, & Soenens, 2012). Finally, a relatively more extrinsic goal pursuit was found to yield social costs as well: It predicted poorer quality friendships and love relations (Kasser & Ryan, 2001), less ecological engagement (Brown & Kasser,

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http://dx.doi.org/10.1016/j.adolescence.2013.07.009

2005), less cooperation when resources are scarce (Sheldon, Sheldon, & Osbaldiston, 2000), more Machiavellianism (McHoskey, 1999), more right-wing authoritarianism and social dominance (Duriez, 2011a; Duriez, Vansteenkiste, Soenens, & De Witte, 2007), a less positive attitude toward immigrants (Duriez, 2011b; Duriez, Vansteenkiste et al., 2007; Van Hiel, Cornelis, & Roets, 2010), a greater proneness to feelings of in-group threat, and a greater readiness to respond to such threat with out-group derogation (Duriez, Meeus, & Vansteenkiste, 2012).

Although plenty of research substantiates the importance of the valuation of extrinsic relative to intrinsic goals, only few studies examined how a preference for a particular type of goals and values develops within the individual. In line with impressionable years models with regard to the socialization of goals, values, and attitudes (Sears, 1990), researchers typically assume adolescence to be a crucial formative phase for the development of a preference for a particular type of goals and values, and in line with the mainstream developmental literature, studies focused on the family context (e.g., Duriez, 2011a; Kasser, Koestner, & Lekes, 2002). Studies examining the parental antecedents of adolescent goal and value preferences found that adolescents reared in cold and controlling families were more likely to adopt a relatively more extrinsic value orientation, presumably because such environments fail to support individuals' basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000). Developing a more extrinsic value orientation would then be an attempt to cope with the resulting insecurities (Kasser, 2002). In addition, Duriez and colleagues (2011a; Duriez, Soenens, & Vansteenkiste, 2007) have shown that the type of goals and values parents promote rather than the parenting styles they employ also shapes adolescents' goal and value preferences. When parents stress extrinsic goals and values to a greater extent, adolescents are more likely to increase the valuation of such goals and values as well. In contrast, when parents stress intrinsic goals, this is likely to result in an increased valuation of intrinsic goals.

Whereas a focus on parenting often entails a rather passive view on adolescents in which parents mold their children into a certain type of goal pursuit, recent research highlights a more active role for adolescents. Specifically, a relatively greater valuation of extrinsic goals was found to evolve as a way of coping with an identity deficit (Dittmar, 2007), and it has been shown that goal and value preferences are shaped through the identity formation process (Duriez, Luyckx, Soenens, & Berzonsky, 2012; Soenens & Vansteenkiste, 2011), suggesting that adolescents actively select the goals and values that are important to them. Given that this search for a personal identity is largely conducted outside the family context, and that, throughout adolescence, time spent among peers increases (Brown & Dietz, 2009), the self-concept increasingly starts depending on obtaining positive regard from peers, which results in peers in general and friends in particular becoming more similar over time (Brechwald & Prinstein, 2011; Hartup, 2009). However, peer similarity can result from different processes: Peer influence, peer selection, and shared contexts (Bukowski, Motzoi, & Meyer, 2009; Hartup, 1996; Hartup & Stevens, 1997). In the latter case, similarity results from being subjected to, for instance, the same school environment. In the case of peer selection, similarity between friends results from friendships being formed on the basis of perceived similarity in pre-existing characteristics or preferences. Only in the case of peer influence, peers actually socialize each other.

To explain peer influence, two main theoretical models have been relied upon (Brechwald & Prinstein, 2011). The first, social learning theory (Bandura, 1977), is relied upon to provide insight in *how* peer similarity comes about. Specifically, social learning theory suggests that, in important social contexts, people tend to adopt behavior through modeling and imitation, such that friends would become increasingly similar over time. This process would be facilitated by the fact that behaviors contributing to peer similarity may be reinforced (e.g., by leading to peer acceptance), while behaviors leading to dissimilarity would be sanctioned (e.g., by leading to peer rejection). The second, social identity theory (Tajfel & Turner, 1979), is mainly relied upon to provide insight in *why* peer similarity comes about. Departing from the assumption that the self-image does not only consist of a personal but also of a social identity, social identity theory states that people will be motivated to identify with groups that provide a positive self-image. Specifically, social identity theory suggests that adolescents will be motivated to adopt the behavior of important others (e.g., best friends) and the norms perceived within an important social context (e.g., a peer group). By conforming to the behavior and norms of their friends, adolescents would achieve acceptance and positive regard from their peer groups, which would result in a positive social identity, and, hence, a positive self-image.

Research has shown peer socialization in externalizing problems (e.g., aggression, antisocial behavior, weapon carrying, and substance use; see Kiuru, Burk, Laursen, Salmela-Aro, & Nurmi, 2010; Sijtsema et al., 2010; Veenstra & Dijkstra, 2011), internalizing problems (e.g., self-injury, loneliness, depressive symptoms, and negative emotions; see Giletta et al., 2011; Prinstein et al., 2010; Stevens & Prinstein, 2005; Veenstra & Dijkstra, 2011), and socio-political attitudes (Poteat, Espelage, & Green, 2007; Poteat & Spanierman, 2010). However, the influence of peers on the development of goal and value preferences received little attention. The present study investigated whether, in adolescence, friends are important when it comes to developing an extrinsic relative to intrinsic goal preference. In other words, this study investigated whether peers actually influence each other's goal preferences. In order to be able to parse socialization from selection effects, high-school students were assessed at two time points (i.e., in the 11th and 12th grade). Specifically, to examine whether peer similarity arises from selection and/or influence processes, stochastic actor-based modeling was conducted. Stochastic actor-based modeling allows for a simultaneous estimation of selection and influence effects within networks that include multiple overlapping relationships (see Veenstra & Dijkstra, 2011). In line with the majority of the abovementioned studies in other domains (e.g., externalizing and internalizing problems and socio-political attitudes), we expected to find peer similarity in goal preferences to result from both selection and influence processes.

Given that previous research has shown that the goals parents promote play an important role in the formation of adolescents' goal and value preferences (Duriez, 2011a; Duriez, Soenens et al., 2007), we examined whether over-time changes in adolescents' goal preferences can actually be attributed to peer dynamics when accounting for parental goal promotion. To

this end, adolescents were asked to not only report on their own goals and values but also on the goals and values they perceived their parents to promote. We decided to ask adolescents about their perception of their parents' goal promotion rather than to sample their parents and ask them about their goal promotion efforts because adolescent perceptions of parenting are often more predictive of various developmental outcomes than parental perceptions or the communality of adolescent and parent perceptions (Miklikowska, Duriez, & Soenens, 2011). Controlling for parent effects also seemed essential because, apart from trying to socializing their children to internalize certain goals and values and apart from passing on genetic characteristics (both of which might to some extent explain a preference for certain goals and values; Brendgen & Boivin, 2009), parents have been shown to directly and indirectly influence their children's peer relations (Ross & Howe, 2009). Direct influence includes facilitating interactions with certain peers (e.g., by choosing a school or a sports team for their children), active participation, and efforts to stay aware of their children's activities and choice of friends (which create possibilities for supervising and managing peer relations). Indirect influence refers to the fact that children derive relationship models from intra-familiar experiences. Attachment theory provides the most comprehensive theoretical account of such indirect influence. Specifically, attachment theory assumes that the early parent–child relationship provides a blueprint for later interactions, including what can be expected from such interactions and what these should look like (Booth-LaForce & Kerns, 2009). Because changes in adolescent goal pursuit might results from either of these parental influences rather than from peer dynamics, we investigated whether over-time changes in adolescent goal preferences can be predicted from the goal preferences of their friends when controlling for (1) the direct influence of parental goal promotion (i.e., socialization and genetic effects) and (2) the fact that peer similarity might result from adolescents befriending peers with a preference for the same goals that are promoted by their parents (i.e., direct and indirect effects on adolescents' choice of friends).

Method

Participants and procedure

The first data wave (= Time 1) consisted of 695 11th graders following an academic track (Mean age = 15.91; range = 15–18; 49.80% male). Data were collected during school hours in three schools (*N*s = 280, 215, and 200, respectively) in the Dutch-speaking part of Belgium. Participants received a code to protect their confidentiality and signed a consent form informing them that they could discontinue participation at any time. One year later, 80% of the initial sample ($N = 545$) participated in the second data wave (= Time 2). All participants had Belgian nationality. At Time 1, 85% lived in an intact family, 13% had divorced parents, and 2% had at least one deceased parent of which only one was an orphan. Participants with and without complete data were compared using Little's (1988) Missing Completely At Random (MCAR) test. A non-significant chi-square ($\chi^2(33) = 44.67$, *ns*) confirmed MCAR, allowing the use of the total sample ($N = 695$) in the primary analyses.

Measures

On a five-point Likert scale ranging from *Completely disagree* to *Completely agree*, participants filled out a Dutch 12-item Aspiration Index (Duriez, Vansteenkiste et al., 2007) assessing the importance of the extrinsic goals of financial success, image, and fame, and the intrinsic goals of growth, community contribution, and affiliation. Each goal was measured with two items. Both at Time 1 and 2, after control for systematic response sets, the scree plot of a higher-order exploratory factor analysis pointed to a one-factor solution, explaining about 40% of the variance. At both time points, the intrinsic goals loaded >0.40 and the extrinsic goals loaded <−0.40 on this factor. After reversing the intrinsic items, a relative extrinsic to intrinsic goal pursuit score was computed by averaging all items (alpha = 0.75 and 0.76 at Time 1 and Time 2, respectively). A positive score indicates a predominant extrinsic goal preference. A negative score indicates a predominant intrinsic goal preference. Because stochastic actor-based models require outcomes to be discrete ordinal variables, scores were divided into six ordinal categories based on the mean and standard deviation (i.e., 1 = less than 1 *SD* below *M*; 2 = between 1 and 1/2 *SD* below *M*; 3 = between 1/2 *SD* below *M* and *M*; 4 = between *M* and 1/2 *SD* above *M*; 5 = between 1/2 and 1 *SD* above *M*; 6 = more than 1 *SD* above *M*).

At both time points, participants were asked to nominate their three best friends in order of importance from a roster of students including all their grade mates (Parker & Asher, 1993). Both cross- and same-gender nominations were allowed. In each school, adolescents selected their friends from a similar size pool of students (i.e., 280 in School A, 215 in School B and 200 in School C). Similar grade-wise peer nomination procedures are widely used to assess adolescent friendships (Poulin & Dishion, 2008). For each school and at each time point, these nominations were combined in adjacency matrices to represent friendship networks. Each matrix consisted of *n* rows by *n* columns (with *n* equal to school size), representing adolescents who gave nominations (i.e., nominators) and those who received nominations (i.e., nominees) respectively. The presence of a friendship tie between a nominator and a nominee is expressed by one and the absence of such a tie is expressed by zero.

At Time 1, participants also filled out a parental goal promotion questionnaire (Duriez, Soenens et al., 2007) assessing to which extent adolescents perceive their parents to promote the intrinsic and extrinsic goals mentioned above (e.g., 'My mother finds it important for me to have many expensive possessions'). After controlling for systematic response sets, for father reports and for mother reports, the scree plot pointed to a one-factor solution explaining about 40% of the variance. In both cases, the intrinsic goals loaded >0.40 and the extrinsic goals loaded <−0.40 on this factor. Subsequently, the intrinsic items were reversed and a relative extrinsic to intrinsic goal promotion score was computed by averaging all items (alpha = 0.78 for both father and mother reports). Positive scores indicate a predominantly extrinsic goal promotion, whereas

negative scores indicate a predominantly intrinsic goal promotion. Because we were interested in goal promotion within the family of origin rather than in maternal and paternal goal promotion per se, mother and father reports were combined to form a parent goal promotion score. Combining these reports seemed justified because (a) mean scores for mothers and fathers were almost identical, (b) reports for mothers and fathers were highly correlated, and (c) reports for mothers and fathers yielded similar correlation patterns (see Table 1).

Plan of analyses

Stochastic actor-based models for network-behavioral dynamics were performed in the SIENA package (Simulation Investigation for Empirical Network Analysis, Ripley, Snijders, & Lopez, 2012) implemented in the statistical system R (R Development Core Team, 2011). Each model estimated the co-evolution (i.e., over-time change) of friendship networks (i.e., network dynamics) and goal pursuit (i.e., behavior dynamics), allowing to simultaneously estimate selection and socialization effects. Selection and socialization effects are typically estimated while controlling for potential confounds that may contribute to friend similarity such as structural network effects (e.g., reciprocity and transitivity) and individual tendency effects (i.e., linear and quadratic shapes; Snijders, van de Bunt, & Steglich, 2010). In previous research, it has been shown that structural network effects and individual tendency can sometimes partially explain selection and influence effects and that the latter may be overestimated when not accounting for structural network and individual tendency effects (Dijkstra, Berger, & Lindenberg, 2011). The total amount of changes in friendship ties and goal pursuit was estimated through an iterative simulation procedure, using a continuous-time Markov Chain Monte Carlo approach that yields unstandardized parameters and standard errors (Snijders, Steglich, & Schweinberger, 2007). Missing data were handled in SIENA by minimizing their effects on parameter estimation.

Stochastic actor-based models were first conducted separately by school. Subsequently, a meta-analytic procedure yielding average parameter estimates and standard errors was used to combine results from the three school networks (Snijders & Baerveldt, 2003). A Fisher's combination procedure with two one-sided tests was employed to test the significance of each average parameter (Hedges & Olkin, 1985). Here, the null hypothesis that a parameter estimate is zero in all networks is tested using right-sided and left-sided tests. For instance, in a right-sided test, the null hypothesis that a parameter is zero in all networks is tested, with the alternative hypothesis being that the parameter is greater than zero in at least one network (Ripley et al., 2012). To control for multiple testing, a Bonferroni's correction was applied and parameter estimates were considered significant only at level 0.025. When combining a small number of networks, the Fisher's combination procedure is preferred over the Snijders–Baerveldt method as it does not assume that the different networks are random samples from the same population (Ripley et al., 2012). The Fisher approach is commonly used to combine stochastic actor-based models from multiple networks (e.g., Mercken, Steglich, Sinclair, Holliday, & Moore, 2012). Finally, the method of Cochran (1954) adapted for social network analyses (Snijders & Baerveldt, 2003) was employed to test the hypothesis that parameter estimates were constant across schools.

Two dependent variables were included in each model: Friendship ties and adolescent goal pursuit. *Friendship ties* (i.e., the formation of a tie over time) were predicted by two sets of parameters, that is structural network effects (representing endogenous effects related to the structure of the friendship networks) and selection effects related to adolescents' attributes. Four structural network effects were included: Average outdegree (i.e., the network density), reciprocity (i.e., the tendency to reciprocate a friendship tie), transitivity triplets (i.e., the tendency to befriend friends of friends) and geodesic distance-2 (i.e., the tendency to avoid befriending friends of friends). Selection effects included ego and alter effects for gender, age, parental goal promotion and adolescent goal pursuit. Ego effects refer to the tendency of individuals with higher values on a specific attribute (e.g., gender, age, parental goal promotion, or adolescent goal pursuit) to give more friendship nominations. Alter effects refer to the tendency of individuals with higher values on a specific attribute to receive more such nominations. Other selection effects included the selection similarity effects for gender, age and adolescent goal pursuit, measuring the tendency of adolescents to nominate peers with similar attributes as friends (i.e., homophilic selection), and the interaction between parental goal promotion ego and goal pursuit alter, which measures the tendency to befriend peers with a preference for goals that are similar to the goals promoted by their parents. *Adolescent goal pursuit* was predicted by friend goal pursuit (i.e., socialization effects), controlling for the main effects of age, gender, parental goal promotion, and individual differences in goal pursuit, that is, the linear shape parameter (i.e., the average tendency toward an intrinsic or extrinsic goal pursuit) and the quadratic shape parameter (i.e., changes in function of the baseline level of goal pursuit). Socialization effects were operationalized as the tendency of adolescents to become more similar over time to their friends in terms of goal pursuit, accounting for the number of outgoing nominations (i.e., total similarity; Snijders & Bosker, 1999). A detailed description of these parameters is available elsewhere (see Veenstra & Steglich, 2012).

Table 1
Means, standard deviations (*SD*), and correlations.

	Mean	*SD*	01.	02.	03.	04.
01. Adolescent goal pursuit T1	−0.76	0.81				
02. Adolescent goal pursuit T2	−0.80	0.77	0.64*			
03. Maternal goal promotion T1	−0.88	0.79	0.60*	0.46*		
04. Paternal goal promotion T1	−0.89	0.84	0.51*	0.35*	0.56*	
05. Parental goal promotion T1	−0.89	0.72	0.62*	0.46*	0.88*	0.89*

*$p < .01$.

Results

Descriptive statistics

Table 1 presents means, standard deviations, and correlations between the study variables. A 2 (time) × 2 (gender) repeated measure ANOVA with adolescent age as covariate was performed to examine time and gender differences in adolescent goal pursuit. Results revealed neither a significant effect of time nor any significant interaction effects. A significant main effect emerged only for gender ($F(1,532) = 34.04$, $p < .001$), indicating that, at both time points, males reported a relatively more extrinsic goal pursuit ($M = -0.97$ and -0.96; $SD = 0.76$ and 0.72, respectively for Time 1 and 2) than females ($M = -0.61$ and -0.62; $SD = 0.82$ and 0.77, respectively for Time 1 and 2). Similarly, a *t*-test analysis revealed gender differences in adolescent perception of parental goal promotion measured at baseline ($t(666) = 4.31$, $p < .001$), with males perceiving more extrinsic goal promotion than females ($M = -0.77$ and -1.01; $SD = 0.72$ and 0.71, respectively). Age was not related to adolescent perception of parental goal promotion. Finally, adolescent goal pursuit measured at both time points was significantly positively related to parental goal promotion assessed at baseline.

Descriptive statistics of friendship networks and adolescent goal pursuit by school are reported in Table 2. Both friendship networks and adolescent goal pursuit were highly similar across schools. Within each school, network density was stable over time, with adolescents nominating on average an equal number of friends at both time points. As indicated by the reciprocity indices, the proportion of reciprocated friendship ties increased from Time 1 to Time 2, with more than 50% being reciprocated at Time 2 within each school. Approximately 20% of the friendship ties formed triadic relationships demonstrating transitivity network closure (see transitivity indices). The Jaccard indices indicated that, overall, about 30% of the friendship ties were stable over time; yet, a number of ties that dissolved or formed between the two time points were also observed, as shown by the Hamming distances. Overall, these network indices suggest that a sufficient proportion of stability and change in friendship ties was observed over time within each school, meeting the prerequisites to conduct social network analyses and properly estimate selection effects (Veenstra & Steglich, 2012).

To measure goal similarity among friends, Moran's network autocorrelation coefficients (Moran's *I*; Moran, 1950) were calculated. Moran's *I* values ranged across schools between 0.06 and 0.25 at Time 1 and between 0.13 and 0.24 at Time 2, indicating that friends were only modestly similar in their goal pursuit and that, overall, this similarity slightly increased over time (with the exception of School C). Similarly, across schools, about 1/3 of the adolescents did not shift in goal pursuit over time (i.e., stable actors), about 1/3 shifted toward a more extrinsic goal pursuit (i.e., increasing actors), and about 1/3 shifted toward a more intrinsic goal pursuit (i.e., decreasing actors). This indicates that an adequate amount of changes in goal pursuit occurred between Time 1 and Time 2, allowing for a proper estimation of socialization effects.

Friendship dynamics: selection effects

The upper part of Table 3 presents the average parameter estimates for friendship dynamics resulting from the SIENA meta-analysis. As expected, all structural network parameters were significant. A negative *outdegree* estimate indicated that participants were selective in their friend nominations (as opposed to randomly selecting friends) and that their choice of friends could be predicted from other parameters in the model. Specifically, a positive *reciprocity* estimate indicated that participants tended to reciprocate friendship nominations. In addition, a positive *transitivity triplets* estimate indicated that participants tended to befriend friends of friends and a negative *geodesic distance-2* indicated that adolescents preferred direct rather than indirect relations (i.e., mediated by a third person).

Table 2
Descriptive of adolescent friendship network and goal pursuit across time.

	School A		School B		School C	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Friendship						
Average outdegree	2.97	2.94	2.83	2.82	2.88	2.89
Density	0.011	0.011	0.013	0.013	0.014	0.015
Reciprocity	57.1%	61.3%	54.4%	61.6%	49.6%	56.9%
Transitivity	20.4%	19.7%	21.0%	22.5%	21.5%	21.3%
Goal pursuit						
Moran's index	0.06	0.13	0.10	0.24	0.25	0.21
	Time 1-Time 2		Time 1-Time 2		Time 1-Time 2	
Friendship change						
Hamming distance	642		467		573	
Jaccard index	0.31		0.35		0.26	
Goal Pursuit change						
Stable actors	35.6%		31.3%		33.5%	
Decreasing actors	29.8%		33.1%		33.5%	
Increasing actors	34.6%		35.6%		33.0%	

Table 3
Average parameter estimates for friendship and goal pursuit dynamics from SIENA meta-analysis.

Parameters	Average estimate	*SE*	Fisher's combination test	
			Left one-sided	Right one-sided
Friendship dynamics				
Outdegree	−2.55[a]	**0.19**	<0.001	1.000
Reciprocity	2.88[a]	**0.19**	1.000	<0.001
Transitivity triplets	**0.46**	**0.04**	1.000	<0.001
Geodesic distance 2	**−0.31**	**0.06**	<0.001	1.000
Gender ego	**−0.25**	**0.05**	0.001	1.000
Gender alter	**0.21**	**0.08**	0.995	<0.001
Gender similarity	**0.50**	**0.05**	1.000	<0.001
Age ego	0.02	0.05	0.625	0.503
Age alter	−0.01	0.07	0.346	0.474
Age similarity	0.11	0.10	0.836	0.254
Parental goals ego	−0.02	0.04	0.466	0.704
Parental goals alter	−0.06	0.04	0.127	0.894
Parental goals ego × Goal pursuit alter	−0.01	0.04	0.399	0.591
Goal pursuit ego	−0.02	0.02	0.389	0.804
Goal pursuit alter	0.02	0.04	0.593	0.251
Goal pursuit similarity	**0.57**	**0.10**	0.998	0.016
Goal pursuit dynamics				
Linear shape	0.04	0.03	0.857	0.109
Quadratic shape	**0.06**	**0.01**	0.998	0.005
Total similarity (socialization)	**0.56**	**0.10**	0.999	0.004
Effect of age	−0.06	0.08	0.173	0.746
Effect of gender	−0.07	0.04	0.174	0.912
Effect of parental goals	0.09	0.03	0.960	0.109

Note. Bold values indicate significant effects.
[a] Indicates significant variance across school networks according to the Cochran's method adapted by Snijders and Baerveldt (2003).

Changes in friendship ties were affected by selection effects related to adolescents' attributes. Females tended to give fewer and receive more friendship nominations compared to males (as indicated by a significantly negative *gender ego* and a significantly positive *gender alter* estimate, respectively). Moreover, a significantly positive *gender selection similarity* estimate indicated that participants were more likely to befriend same-gender peers. Selection effects related to age and parental goal promotion were not significant. Neither age nor the parental goals affected the number of nominations that adolescents gave and received (as indicated by the age *ego* and age *alter* parameters, respectively). Moreover, adolescents did not specifically select as friends same-age peers (as indicated by a non-significant *age similarity* parameter). Also, the interaction between parental goal promotion and friend goal pursuit (i.e., the *parental goals ego* × *goal pursuit alter* estimate) was not significant, indicating that adolescents did not especially select as friends peers showing a goal pursuit that is similar to the goals their parents are perceived to promote. In addition, no significant effects were found for the goal pursuit ego and alter parameters, suggesting that adolescent goal pursuit did not affect the number of given and received nominations. Finally, after controlling for all of these effects, a significantly positive *goal pursuit similarity* estimate indicated that participants were more likely to befriend peers with a similar goal pursuit, providing evidence for homophilic selection effects with respect to goal pursuit. Cochran's method showed that all of the abovementioned parameter estimates were constant across schools, with the exception of outdegree and reciprocity.

Goal pursuit dynamics: influence effects

Average parameter estimates for goal pursuit dynamics are shown in the bottom part of Table 3. The non-significant linear shape estimate for goal pursuit indicated that there was no general tendency toward intrinsic or extrinsic goals, and adolescent goal pursuits were approximately normally distributed around the mean. Yet, adolescents who reported a more extrinsic goal pursuit at baseline were more likely to report an even more extrinsic goal pursuit over time compared to adolescents with a more intrinsic goal pursuit at baseline, suggesting a self-reinforcing effect (positive quadratic shape). No main effects of gender and age were found on changes in adolescent goal pursuit. Parental goal promotion did not contribute to over-time changes in adolescent goal pursuit either. However, a significant socialization (or influence) effect was revealed, indicating that, over time, adolescents tended to become more similar to their friends in terms of goal pursuit. Again, Cochran's method showed that there was no significant variance across schools in any of these parameter estimates.

Discussion

The present study examined whether friends are important in the socialization of a preference for extrinsic relative to intrinsic goals and values. Specifically, by applying stochastic actor-based modeling to longitudinal network data, we aimed to find out whether peer similarity results from peer selection or peer socialization (i.e., peer influence). In line with our hypothesis, results showed that both processes are at work during adolescence. Hence, similarity in goal pursuit between

adolescents and their best friends does not only result from friendships being formed on the basis of pre-existing goal preferences, but also from friends actually influencing and shaping each other's goal preferences. In sum, it appears that friends are not only important sources of influence when it comes to outcomes such as externalizing or internalizing problems (Dishion & Tipsord, 2011; Prinstein & Dodge, 2008) but are also important when it comes to the development of goal and value preferences. Results were found across schools, while controlling for network dynamic effects (e.g., transitivity), while controlling for differences in age and gender, while controlling for individual tendency effects (i.e., linear and quadratic shapes; Snijders et al., 2010), and while controlling for both the direct effect of parental goal promotion (i.e., socialization and genetic effects) and the fact that peer similarity might result from adolescents befriending peers with a preference for the same goals that are promoted by their parents (i.e., direct and indirect effects of parental goal promotion on adolescents' choice of friends).

In spite of the sophisticated statistical analyses and research design, the present study has some important limitations. First, participants were asked to nominate their three best friends. There are two problems with this approach: (1) The focus on best friends is too narrow to investigate effects occurring within the larger peer network, and (2) this does not allow focusing on romantic relations, which might take up a special place when it comes to (young) people influencing each other (Kiesner, Kerr, & Stattin, 2004). Second, participants were asked to nominate friends within their school, implying they had no other option than to select friends with a similar educational background. In some domains (e.g., with respect to delinquency), friends from outside the school appear more important than friends from within the school (Dishion, Andrews, & Crosby, 1995). Third, although, in our analyses, we did not assume homogeneity across schools (allowing for some variation in exposure to contextual influences), it is still plausible to assume that, within schools, friendships are mainly formed within the same classroom. As a result, contextual effects such as the effect of the goals that are promoted by a certain teacher may also influence adolescents' goals. As a consequence, what we think is friend socialization might be a classroom effect. To rule out this possibility, future research should pay explicit attention to such effects. Fourth, our data covered a relatively short time (i.e., one year) and age span (i.e., 15–18 years old). The importance of goal preferences in peer selection and the extent to which peers influence each other's goal preferences may be different in other age groups. For instance, earlier on in adolescence, parental influence might exceed peer influence. In short, due to this restricted time and age span, we may have missed out on some of the dynamics at play in the development of a preference for a particular type of goals and/or a particular type of friends. Finally, data were collected in areas with a relatively low immigrant population. In combination with the fact that, in Belgium, people from foreign descent are underrepresented in an academic track, our sample was almost exclusively Caucasian (in terms of race) and Flemish-Belgian (in terms of ethnicity). Future research might want to sample a more heterogeneous high school population to replicate our findings in different racial and ethnic groups.

Apart from addressing these limitations, future research might want to examine *how* and *why* some adolescents change their goal and value preferences to bring them more in line with the ones of their friends. As noted in the introduction, adolescents might adjust their goals and values by imitating and copying the goals and values of their best friends (modeling); a process that might be driven by the desire of adolescents to derive esteem and self-worth from a positive social identity and positive peer regard by following the perceived norms of the valued in-group (social identity theory). Future research might want to investigate whether this is indeed the underlying motivation. If so, one might, for instance, predict that the degree to which one attaches importance to the in-group will be predictive of the degree to which one will (try to) align one's goals values with the goals and values of one's friends. In addition, future studies might also want to examine whether peer similarity has a different impact on, for instance, friendship quality, depending on the specific content of this similarity. Given that research has shown that a greater preference for extrinsic goals is positively associated with Machiavellianism (McHoskey, 1999) and negatively with empathy (Sheldon & Kasser, 1995), it might be that bonds between friends sharing an extrinsic goal pursuit are of poorer quality than bonds between friends sharing an intrinsic goal pursuit. Similarly, given that a relatively more extrinsic goal pursuit was found to be negatively associated with domain-specific adjustment such as quality of learning, school performance, and health-related behavior (Vansteenkiste et al., 2008), adolescents with a relatively greater extrinsic goal focus might have indirect adverse effects on their best friends' adjustment. Relatedly, the antecedents of extrinsic goal similarity may be different from the antecedents underlying intrinsic goal similarity. That is, whereas experiencing support for the psychological needs of autonomy, competence, and relatedness is likely to underlie the search for soul mates with an intrinsic goal profile, the frustration of these same needs is likely to lead one to bond with peers with an extrinsic goal profile. Indeed, hanging out with peers who value material success, consumer gadgets, and being cool and popular can be perceived as one way of coping with experienced need thwarting (Vansteenkiste & Ryan, 2013). Finally, an interesting avenue for future research might be to investigate peer dynamics in the formation of a preference for other types of goals and values, such as the Self-Enhancement versus Self-Transcendence and Conservation versus Openness to Change dimensions that Schwartz (1992) identified. Given that the former dimension was argued to bear substantial overlap with the extrinsic versus intrinsic goal dimension (Duriez, Luyckx et al., 2012), the latter dimension deserves special attention, especially because it has been argued that differences in "traditionalist" attitudes are at least in part due to genetic factors (Bouchard, 2009). Hence, preferences for Conservation versus Openness to Change values might be less open to peer influence.

Conclusion

Results of a longitudinal social network analyses confirmed the hypothesis that similarity in goal pursuit between adolescents and their best friends does not only result from friendships being formed on the basis of already existing goal preferences, but also from friends actually influencing and shaping each other's goal preferences. In other words, it appears

that friends are not only important sources of influence when it comes to outcomes such as externalizing or internalizing problems but also play a crucial role in the development of adolescents' goal and value preferences.

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