한국심리학회지: 학교
The Korean Journal of School Psychology
2018, Vol. 15, No. 3, 307-329
http://dx.doi.org/10.16983/kjsp.2018.15.3.307

Social Dominance Goals Matter in Friendship Dynamics Around Aggressive Behavior: Longitudinal Social Network Perspective

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This research investigated whether youth's social goals moderate friend selection and influence processes on aggressive behavior during early adolescence. Two waves of data on youth's friendship, aggressive behavior, and social goals were retrieved with fifth and sixth graders from 26 classrooms (N=736, 52% girls at wave1, N=677, 52% girls at wave 2). Longitudinal Social network analyses, conducted with stochastic actor-based models, indicated that friends were similar to each other in aggressive behavior and that this similarity was due to both friend selection and influence effects. Youth's social dominance goals moderated friend selection based on aggressive behavior; Youth who strive for social dominance were more likely to select highly aggressive peers as friends, and became more aggressive over time. The current study underscores the importance of youth's social goals in friendship dynamics around aggressive behavior in the classroom.

Key words : friendship, social goals, aggressive behavior, adolescence, social network

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During adolescence, rates of aggressive behavior increase, posing considerable concerns to parents and teachers alike. Being a victim of aggressive behavior has severe consequences that can affect the physical and psycho-social health of youth, such as increased loneliness, depression, anxiety, and self-destructiveness(see Gini & Pozzoli, 2009; Hawker & Boulton, 2003; Ttofi et al., 2011). Aggressive youth are also at risk: Compared to other youth, aggressive youth often get involved in delinquency and many risk-taking behaviors that could affect their academic and social development over time(see Karna et al., 2011; Loeber & Hay, 1997; Moffitt, Caspi, Harrington, & Milne, 2002). Given the abundance of adjustment difficulties associated with youth's aggressive behavior, it is critical to increase our knowledge on what makes certain youth increase or decrease aggressive behavior as well as individual factors that temper or magnify the influence to effectively intervene youth's aggressive behavior in schools and classrooms.

Friendships and youth's aggressive behavior: Friend selection and influence

Since early adolescents' aggressive behavior is a salient risk factor for later adjustment, much research has sought to understand the factors that contribute to youth's aggressive behavior, and numerous studies found support for the influence of friends as a fundamental input of adolescents' increased level of aggressive behavior. The handful of studies indicate that aggressive behavior of youth's friends is one of the robust predictors of adolescents' own aggressive behavior (Dishion, Patterson, & Griesler, 1994; Espelage, Holt, & Henkel, 2003), and the friendship dynamics in the classroom are critically related to the development of youth's aggressive behavior(Shin, 2017a; Sijtsema, Ojanen, Veenstra, Lindenberg, Hawley, & Little, 2010b).

Consistent and robust findings in youth development literature suggest that the similarity between friends' aggressive behavior is quite high and can be attributed to two mechanisms: friend selection and influence. Much research has shown not only that youth befriend other peers who are similar in aggressive behavior(i.e., *friend selection*), but also are influenced by their friends' aggressive behavior over time(i.e., *friend influence or socialization*; Dijkstra, Berger, & Lindenberg, 2011; Sijtsema et al., 2010b). Aggressive youth are likely to affiliate with aggressive peers, and sustained friendships reinforce and escalate youth's aggressive behavior over time as they provide a rich context for the socialization of aggressive behavior. Through such processes, friends are evidenced to play a prominent role in the development and maintenance of adolescents' aggressive behavior(Fortuin, Geel, & Vedder, 2014; Logis et al., 2013; Molano et al., 2010).

However, recent evidence has suggested that friend selection and influence processes on

aggressive behavior are more complex than once thought. Rather than being static across contexts, peer processes are affected by the features of the peer ecology and the classroom including the prevalence of aggressive behavior, salience of peer values, and relational climate of the classroom (Dishion & Tipsord, 2011; Rambaran, Dijkstra, & Stark, 2013; Shin, 2015a;). Further, friend selection and influence processes do not affect equally all youth, but individual attributes of youth, such as demographic characteristics, personal traits, and private beliefs and values function to moderate these processes(Molano et al., 2010; Rulison, Gest, & Loken, 2013; Shin, 2017a). While in general, youth may choose similar friends and socialize each other's behaviors to become more similar over time, there is a variability in these patterns. Depending on individual attributes of youth, some adolescents may show different friend selection tendencies and/or be more susceptible to friend influence on aggressive behavior. Thus, in the present study, we focus on early adolescents' social goals as one of the potential moderators of friend selection and influence processes, and examine if early adolescents' social goals may place some youth at greater risk than others of selecting aggressive friends or succumbing to friend influence in the classroom at school.

Moderating role of social goals in friend selection and influence of aggressive behavior

Social goals refer to cognitive representations of what an individual is trying to achieve in the social domain, and provide direction and energy for behavior(McClelland, 1985; Wentzel, 2000). Stored in the long-term memory, trait-like goals are activated by contextual cues and affect social information processing and behavior(Crick & Dodge, 1994). Social goals allow youth to focus their attention on goal-relevant information, activating behavioral strategies associated with the goal, and influence adjustment(Dweck & Leggett, 1988). For example, dominance goals are activated when encountering an uncertain peer context and goal-concordant behavioral strategies like aggression are used to establish dominance in early adolescence(Cillessen & Rose, 2005; Pellegrini & Long, 2002).

Researchers have examined adolescents' social goals(i.e., dominance, popularity, and intimacy) by asking youth what they like to strive for when they are with peers, focusing on outcomes that would make them happy or feel socially successful(Jarvinen & Nicholls, 1996; Nicholls, Cheung, Lauer, & Patashnick, 1989). Previous work has shown that although moderately correlated, social goals(i.e., dominance, popularity, and intimacy) are distinct and differently related to adjustment(Kiefer & Ryan, 2008; Kiefer & Wang, 2016). Dominance goals(i.e., striving to have power over peers) were associated with maladaptive forms of engagement and low

achievement and positively related to overt and relational aggression(Kiefer & Ryan, 2008; Ojanen, Findley, & Fuller, 2012; Ojanen, Grönroos, & Salmivalli, 2005; Rodkin et al., 2013) while intimacy goals(i.e., focus on establishing relationships) were positively associated with adaptive forms of engagement and negatively related to overt aggression(Kiefer & Ryan, 2008; Ojanen et al., 2012). Popularity goals(i.e., striving for high social status) were not generally associated with engagement but were positively associated with overt or relational aggression(Dawes & Xie, 2014; Kiefer & Ryan, 2008, Rodkin et al., 2013).

As social goals are cognitive representations of things youth want to accomplish and direct their behavior towards social outcome(Ford, 1992; Wentzel, 2000), youth's social goals may not only be associated with individual levels of social behaviors such as aggression, but also play a role in friendship dynamics around aggressive behavior. Youth's social goals would be manifested in the interactions with peers, and may provide an important standard for selection and influence of friends regarding aggressive behavior. If youth focus on specific goals how social success is defined and evaluated, they may seek out friends that are concordant with such goals, and may be influenced by friends' behavior. Therefore, it could be expected that youth's social goals would moderate friend selection and influence processes on aggressive behavior.

When youth have dominance goals or popularity goals, they would focus on having power over peers(i.e., dominance goals) or strive for high social status(i.e., popularity goals). These youth would be focused on getting peers to comply their wishes and instilling fear in others, or having visibility and prestige within the peer group and the classroom(Jarvinen & Nicholls, 1996). In this context, aggressive peers could be seen as attractive friendship partners since aggression is often related to a high social status or dominance(Caravita & Cillessen, 2012; Garandeau & Cillessen, 2006). Thus, youth with dominance or popularity goals would be more likely to select aggressive peers as friends since it may meet their goals(i.e., dominance and popularity) and be consistent with their behavioral tendencies(i.e., the similarity attraction hypothesis; Byrne & Griffitt, 1973; Shin, 2017a). Therefore, we hypothesize that youth with dominance goals or popularity goals would have a higher tendency to select aggressive peers as friends in the classroom.

When youth have intimacy goals, they focus on establishing relationships characterized by mutual support and disclosure of thoughts and feelings(Jarvinen & Nicholls, 1996). These youth have salient concern over quality of their relationships(Cillessen & Mayeux, 2004) and try to build mutually supportive and close friendships through helping, cooperating, and sharing with peers(Shin & Ryan, 2012). In this context, aggressive peers would not be seen as

attractive friendship partners since aggression can be threatening for forming and maintaining good relationships with their friends. Thus, youth with intimacy goals would be less likely to select aggressive peers as friends since aggressive behavior is not consistent with their goals(i.e., intimacy) and behavioral tendencies(i.e., being pro-social and cooperative; Parkjurst & Hopmeyer, 1998; Rubin, Bukowski, & Parker, 2006; Shin, 2017a). Therefore, we hypothesize that youth with intimacy goals would have a lower tendency to select aggressive peers as friends in the classroom.

Extending this logic, youth's social goals may set youth up to be differentially susceptible to friend influence. Specifically, friend influence on aggressive behavior would be magnified when youth have dominance or popularity goals. When youth focus on having power over peers or striving for high social status, they would have increased interactions with friends around aggressive behavior. Youth's focus on dominance and popularity may not only increase the overall incidence of aggressive behavior, but may also strengthen their social status, such as perceived popularity(Caravita & Cillessen, 2012; Garandeau & Cillessen, 2006). Positive reinforcement for aggression and frequent interactions with other aggressive peers would create the conditions for friends to be more influential on aggressive behavior. In contrast, when youth have intimacy goals, they would be more concerned about establishing and maintaining good relationships, and less willing to hang around with aggressive peers(Shin, 2017a), which would create the conditions for friends to be less influential on aggressive behavior. Therefore, we hypothesize that youth with dominance or popularity goals would be more influenced by friends' aggressive behavior, and youth with intimacy goals would be less influenced by friends' aggressive behavior over time in the classroom.

Overview of the current study

The central goal of the current research is to examine youth's friend selection and influence processes of aggressive behavior and the moderating role of youth's social goals on aggressive behavior in these processes. To examine our research questions, we used stochastic actor-based modeling of social networks (SIENA) to simultaneously examine selection and influence of friends over time, while controlling for structural network tendencies(e.g., reciprocity, transitivity) as well as possible confounding factors, such as youth's gender and direct effects of social goals on aggression(see Figure 1 for the graphical presentation). Regarding friendship processes of selection and influence, we make the following hypotheses: both friend selection and influence processes will contribute to similarity seen across time in friends' aggressive behavior. Regarding the potential moderating role of youth's social goals on aggressive behavior in friendship selection and influence we make the

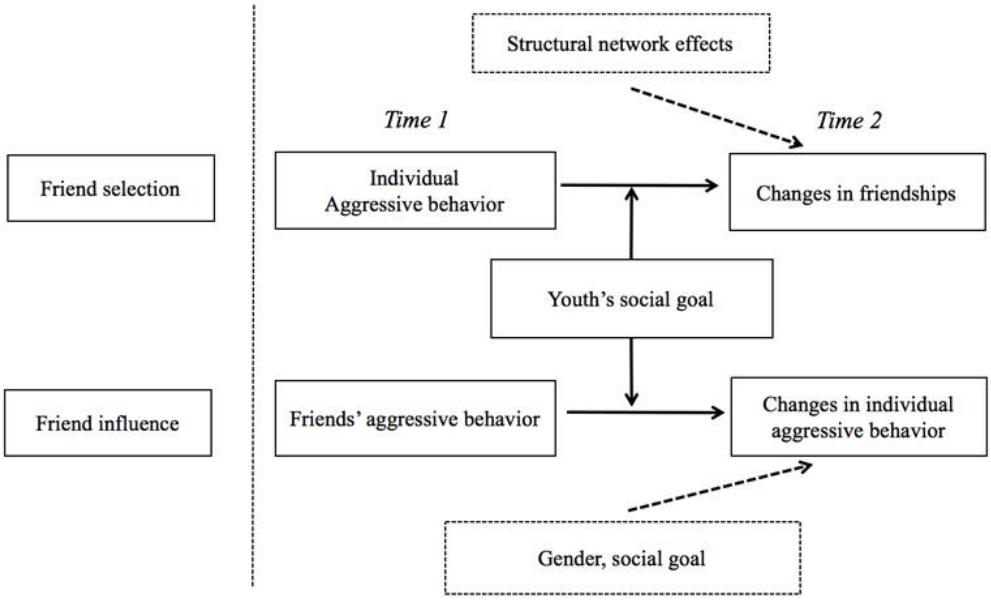

Figure 1. Graphical presentation of the selection and influence of friends.

Note. The solid lines in Figure 1 represent that youth can change their friendship network(friend selection) and behavior(friend influence) between two time points. The dashed lines represent that friend selection and influence effects are examined controlling for the structural network effects(e.g., density, reciprocity, transitivity), the effects of youth's gender and social goals.

following hypotheses: youth with dominance and/or popularity goals will be more attracted to aggressive friends and will be more influenced by friends' aggressive behavior, and youth with intimacy goals will be less attracted to aggressive friends and will be less influenced by friends' aggressive behavior.

Methods

Participants and procedures

Youth participated in the research as they began a new semester(Wave 1) and then at the end of the semester(Wave 2), approximately five months apart. Participants attended one of 26 classrooms in 4 elementary schools in fifth and sixth grade in Chungcheong province. These classrooms were from public schools located in small to moderate size urban areas. Participants stayed all day long with the same peers and a teacher in self-contained classrooms during regular school days. An opt-out consent procedure was used in which parents received a letter describing what was involved in participating in the study. If they did not want their children to participate, they could contact

the school; otherwise, youth took part in the research. Participants were informed that their participation was optional and that their responses would be kept confidential. Participants signed an assent form indicating that they understood the conditions and wanted to participate prior to starting the survey. Surveys were administered to participants in their classrooms. The total sample size was 736 at wave 1 and 677 at wave 2, and 52% female at both waves 1 and 2. The participation rate was 97% and attrition was 8%. Attrition analyses showed no significant differences in research variables of interest between partially missing and complete cases.

Measures

We used the translated version of the original English measures. Standard translation and back-translation procedures were employed with English and Korean experts to modify the wording of the items to ensure equivalence in meaning between the English and Korean versions(Erkut, 2010).

Friend networks. Youth's friends within classrooms were measured by asking youth to nominate their closest friends, further described to youth as "the friends you hang around with and talk to the most in this class." Youth made friend nominations as many or as few as they wanted, using a list of the names of the youth in the classroom(for similar methods, see Cillessen & Borch, 2006). Youth who were nominated by friends but did not agree to participate in the research were removed from the list when we created friendship networks for each classroom. The size of the friendship networks ranged from 23 to 31.

Aggressive behavior. Students' aggressive behavior measured in this study was meant to capture physical or overt aggressive behavior that includes acts meant to harm a peer physically such as hitting, pushing, or threatening. At both waves 1 and 2, teachers were asked to complete the Interpersonal Competence Scale-Teacher(ICS-T; Cairns, Leung, Gest & Cairns, 1995) on each of their participating students. Among 18 items consisting of multiple social behaviors, the present investigation used the following ICS-T factors: *aggressive behavior* composed of three items: "This student gets in trouble:", "This student fight with others", and "This student argue with others." All items were rated on a 5-point scale(1 = not at all true, 3 = somewhat true, 5 = very true). Scale was found to be reliable in our sample(Cronbach's alpha for aggressive behavior = .88 and .87 for waves 1 and 2, respectively). All items for aggressive behavior were averaged and then rounded up to the nearest integer to receive the original scale with 5 categories(1 = not at all true, 5 = very true).

Social goals. Dominance, popularity, and

intimacy goals were measured with items from the Social Goals Questionnaire(Jarvinen & Nicholls, 1996; Kiefer & Ryan, 2008). Social dominance goal items concern having power over peers(e.g., I make them do what I want). Popularity goal items concern establishing high social status(e.g., Everyone wants me for a friend). Intimacy goal items concern establishing intimate relationships(e.g., I really know someone's feelings). All items include the stem "I like it when," which focuses youth on outcomes that would make them happy or feel successful. All items were rated on a 5-point scale(1 = not at all true of me, 3 = somewhat true, and 5 = very true of me). Each of the three social goals was reliable in our sample(Cronbach's alpha for dominance, popularity, and intimacy goals were .89, .92, .91, respectively). All items for social goals were averaged and then rounded up to the nearest integer to receive the original scale with 5 categories(1 = not at all true, 5 = very true) because our estimation method(RSiena) requires that variables have whole-positive values.

Analytic strategy

Analyses were conducted using longitudinal social network analyses implemented using the RSiena software program(RSiena version 1.1- 289 in R 3.2.2). This approach builds social networks based on individual youth's nominations of their friends, while integrating information about their behavior(e.g., aggressive behavior) at multiple time points. By means of simulation, the likelihood of changes in the friendship network as well as changes in behavior are determined. Estimates are derived from iterative simulations within RSiena using a stochastic approximation (MCMC; Markov Chain Monte Carlo) algorithm. Reliable estimates are assessed with good convergence statistics of the estimation algorithm as indicated by near-zero convergence t statistics (for more details on RSiena estimation, see Snijders, van de Bunt, & Steglich, 2010).

Missing data were handled in the RSiena program, which allows for some missing data on network variables, covariates and dependent action variables. In a simulation study, less than 10% missing data did not provide estimation problems or bias(Huisman & Steglich, 2008). In RSiena, when data were missing, it is imputed with the value from the previous wave. If such information is not available(always the case at wave 1) then the value 0(no friendship tie) is imputed for friendship ties and the modal value is imputed for other variables. Note that these imputed values did not contribute to the computation of any statistics in SIENA. Only individuals with valid data at the beginning and at the end of a period were considered in the estimation process(Ripley et al., 2017).

In the current study, we estimated the relative contributions of network-behavior dynamics (i.e., friend selection and influence effects) for aggressive behavior, while controlling for various

structural network features(i.e., density, reciprocity and transitivity) and covariate effects(i.e., gender, and social goals). We ran preliminary models separately by grade level. Results were consistent across grade level so we combined grade levels to gain power for examining friend influence effects. The size of classroom networks is small(compared to schools or other organizations). Thus, to obtain well-converged estimates, classrooms were combined and analyzed simultaneously using the multi-group option(Ripley et al., 2017). Analysis in RSiena yields parameters related to network dynamics(structural network and friend selection effects) and behavior dynamics(friend influence effects and behavioral tendencies and covariate effects). We describe in greater detail below the key aspects of what the models specified and estimated.

Friend structural network effects. To examine the structural network features, we included three network effects: density, reciprocity, and transitive triplets. *Density* describes the overall tendency of youth to nominate classmates as friend. *Reciprocity* describes the tendency for youth to reciprocate a relationship. *Transitive triplets* describe the tendency for dyadic friendships to be embedded within triadic patterns of relations(e.g., my friend's friend is my friend). Ripley et al., 2017 recommend to include these basic network structural features to accurately examine the friend selection and influence.

Friend selection effects. To examine the friend selection based on aggressive behavior, we included the effects of aggressive behavior on friend nominations given(*ego effect*), received(*alter effect*), and selecting similar peers on the levels of aggressive behavior(*similar behavior*). Thus, *aggressive behavior ego effect* estimates the tendency for aggressive youth to make many friend nominations, *aggressive behavior alter effect* estimates the tendency for aggressive youth to receive many friend nominations from peers, and *similar aggressive behavior effect* estimates the tendency for aggressive youth to form friendships with other aggressive peers. Prior research has consistently found preference for same-gender friendships, especially among adolescents(Maccoby, 1998). To account for this tendency, *same gender effect* was included, where positive estimate would indicate a strong tendency for youth to nominate same gender peers as friends. To control for the friend selection based on social goals, we also included the effects of each of the social goals on friend nominations given(*ego effect*), received(*alter effect*), and selecting similar peers on the levels of social goals(*similar goal*).

Friend influence effects. To examine the friend influence on aggressive behavior, we included *average similarity effect* for aggressive behavior. This effect estimates whether youth changed their aggressive behavior to more closely

resemble their friends' aggressive behavior.

Behavioral tendencies and covariate effects. We controlled for behavioral tendencies in aggressive behavior: general tendency(*linear shape*) and dispersion(*quadratic shape*). A significant and positive(or negative) linear shape effect indicates whether the majority of youth score above(or below) the mean of aggressive behavior. A positive quadratic shape effect indicates a self-reinforcing pattern, in which youth with low levels of aggression experience further decline in aggressive behavior whereas those with high levels of aggression experience further increase in aggressive behavior over time. A negative quadratic shape effect indicates a self-correcting mechanism, in which everyone is going towards the mean(Snijders et al., 2010). Additionally, we controlled for potential effects of social goals (*effect from social goals*) and gender(*effect from gender*) on aggressive behavior.

Moderating effects of social goals. To examine the moderating role of youth's social goals on friend selection and influence, we included two interactions combining *social goals* with friend selection(i.e., *alter*) and friend influence(*i.e., average similarity*) for aggressive behavior. Using dominance goals as an example, the first interaction(i.e., *dominance goal ego X aggressive behavior alter*) examines whether youth who have dominance goals are more likely to select aggressive peers as friends, and the second interaction(i.e., *dominance goal ego X aggressive behavior average similarity*) examines whether youth who have dominance goals are more influenced by friends' aggressive behavior.

Overview of analysis. Model specification followed in three steps. In the first model, friend selection and influence effects based on youth's gender and aggressive behavior were estimated, while controlling for network structure effects(e.g., density, reciprocity, transitivity) and behavioral tendencies. This model tested friend selection and influence on aggressive behavior, and served as a baseline model for the models in which the effects of covariates(i.e., social goals and gender) were additionally tested, and the moderating effects by social goals on friend selection and influence were tested.

Results

Descriptive statistics

Descriptive information about the sample and network characteristics is presented in Table 1. The average out-degree(average number of friend nominations) indicates that youth nominated an average of three friends at wave 1 and four friends at wave 2. The density indicates that youth nominated around 12-17% of their classmates as friends over the two waves. The networks were characterized by high reciprocity

Table 1. Description of the sample and changes in friendship networks, aggressive behavior, and social goals from W1 to W2.

	W1	W2		W1-W2
Sample			Sample change	
Cohort size	736	677	Number of leavers	98
Respondents missing	25	67	Number of joiners	39
Fraction females	52%	52%	Number of stayers	638
Friendship			Friendship change	
Average number of ties	94.13	102	Hamming distance(change)	83.25
Average outdegree	3.30	4.01	Jaccard index(stability)	40%
Density	12%	17%	Friendship tie change	
Reciprocity	60%	56%	Ties dissolved	48.63
Transitivity	53%	53%	Ties emerged	35.08
Aggressive behavior			Ties maintained	56.21
Average(SD)	1.95(.43)	1.99(.64)	Aggressive behavior change	
Social goals			Fraction increased	23%
Intimacy goals	3.90(.94)	3.70(.98)	Fraction stable	68%
Dominance goals	2.50(1.02)	3.59(.99)	Fraction decreased	10%
Popularity goals	3.47(1.01)	3.60(.99)		

Note. Density is the proportion of given ties relative to the total amount of possible ties; Reciprocity is the proportion of mutual ties; Transitivity is the proportion of tie configurations that could become cohesive peer groups; Hamming distance is the amount of tie changes from the beginning to the end of the time point; Jaccard index is the fraction of stable ties relative to all new, lost, and stable ties; For more information regarding these network indices and the other statistics in this table as well as their calculations, we refer to Veenstra and Steglich(2012).

and transitivity, indicating that over 56% of the friendship nominations were reciprocated and over 53% were part of a transitive triplets. The Jaccard index(fraction of stable friendship nominations among the new, lost, and stable ties between observed data points) indicates the amount of stability and should be more than 30% to permit complex selection dynamic modeling in RSiena with adequate statistical power(see Veenstra & Steglich, 2012). The Jaccard index in our networks was 40% so there was sufficient stability and change. Table 1 presents the means and standard deviations of aggressive behavior as well as control variables at waves 1 and 2; trends which were accounted for in the behavioral dynamics in the SIENA

models. The changes of aggressive behavior are also presented in Table 1. In terms of the changes, 23% of youth increased and 10% of youth decreased for aggressive behavior.

SIENA results

Table 2 presents the findings with regard to the estimation of network-behavior dynamics for aggressive behavior, the effects of covariates(i.e., social goals and gender), and the interaction effects with social goals. All of the models satisfied the model convergence requirements, which recommend the convergence t statistics less than 0.25 in the overall maximum convergence and less than 0.1 for all the individual parameters(see Ripley et al., 2017). Significance tests were performed for all of the models by dividing the estimates with its standard error resulting in t-values which under the null hypothesis are approximately normally distributed(Ripley et al., 2017). We discuss only the main findings, starting with friend selection and influence effects on aggressive behavior, following with the effects of covariates, and the moderating effects of social goals.

Friend structural network features. All structural network effects were statistically significant and similar across all models(see the first portion of Table 2). Youth were selective in their friendships(i.e., *negative density*) and reciprocated friendships(i.e., *positive reciprocity*). Further, youth tended to nominate friends of friends as friends(i.e., *positive transitive triplets*). Youth preferred same gender friends(i.e., *positive same gender*).

Friend selection on aggressive behavior. The *aggressive behavior ego* effect was statistically significant and positive(Est. = 0.12, 0.13, 0.11, $p < .001$), indicating that aggressive youth are active in forming friendships and nominate many peers as friends. The *similar aggressive behavior* effect was statistically significant and positive(Est. = 0.39, 0.42, 0.38, $p < .001$), indicating that aggressive youth tend to form friendships with other aggressive peers in the classroom. The *similar intimacy goal* effect was statistically significant and positive(Est. = 0.50, $p < .05$), indicating that youth who have intimacy goals tend to form friendships with other peers who have similar goals in the classroom(see the second portion of Table 2).

Friend influence on aggressive behavior. As indicated by the statistically significant and positive *average similarity* effect for aggressive behavior(Est. = 2.08, 2.79, 2.99, $p < .05$), youth tend to become more similar to their friends in aggressive behavior over time(see the third portion of Table 2).

Behavioral tendencies and covariate effects. The linear shape effect for aggressive behavior was statistically significant and negative(Est. =

Table 2. RSiena estimates for friend selection and influence effects for aggressive behavior

	Intimacy Goal		Dominance Goal		Popularity Goal	
	Est.	SE	Est.	SE	Est.	SE
Network Effects						
Density	-1.17***	0.05	-1.06***	0.05	-1.02***	0.05
Reciprocity	0.83***	0.04	0.78***	0.04	0.77***	0.04
Transitive triplets	0.36***	0.06	0.27***	0.05	0.23***	0.05
Behavior Selection Dynamics						
Gender						
Gender alter(male=1)	-0.11**	0.04	-0.11**	0.03	-0.09*	0.04
Gender ego	0.14**	0.04	0.14**	0.04	0.12**	0.04
Same gender	0.55***	0.04	0.55***	0.04	0.57***	0.04
Social goal						
Goal alter	-0.04	0.04	0.02	0.03	0.04	0.03
Goal ego	0.12**	0.04	-0.06*	0.03	0.02	0.03
Similar goal	0.50*	0.20	0.09	0.23	0.15	0.16
Aggressive Behavior						
Behavior alter	-0.01	0.03	-0.01	0.03	-0.01	0.03
Behavior ego	0.12***	0.03	0.13***	0.03	0.11***	0.03
Similar Behavior	0.39***	0.12	0.42***	0.12	0.38***	0.11
Goal ego X behavior alter	0.08	0.07	0.11*	0.05	0.04	0.04
Behavior Influence Dynamics						
Aggresive Behavior						
Linear shape	-0.25**	0.09	-0.17*	0.08	-0.17*	0.08
Quadratic shape	0.07	0.07	0.09	0.09	0.07	0.06
Average similarity(influence)	2.08*	0.90	2.79*	1.27	2.99*	1.13
Effect from gender	0.17	0.17	0.30*	0.14	0.16	0.15
Effect from goal	-0.19	0.30	0.51*	0.24	0.04	0.18
Goal ego X behavior average similarity (influence)	-0.04	1.89	2.83	1.99	-1.71	1.79

Note. * $p < .05$. ** $p < .01$. *** $p < .001$; two-tailed tests. For gender, boys were coded as 1 (girls were coded as 0).

-0.25, -0.17, -0.17 $p < .05$), indicating that the majority of youth score below the mean of aggressive behavior. Youth who have dominance goals showed increased aggressive behavior(i.e., *effect from dominance goals;* Est. = 0.51, $p < .05$), and boys showed increased aggressive behavior (i.e., *effect from gender;* Est. = 0.30, $p < .05$) over time.

Moderating effects of social goals. Dominance goals moderated selection of friends on aggressive behavior among youth(see the last row of the second portion in Table 2). When youth have dominance goals, they are more likely to form friendships with aggressive peers (i.e., *dominance goal ego X aggressive behavior alter;* Est. = 0.11, $p < .05$). Moderating effects of social goals on friend influence were not statistically significant.

Discussion

The main goal of the current study was to examine friendship dynamics(i.e., friend selection and influence) of aggressive behavior, and the moderating role of early adolescents' social goals on aggressive behavior in these processes. Using a combination of teacher reports(i.e., youth's aggressive behavior), peer reports(i.e., friend nominations) and self-reports(i.e., social goals) and thereby reducing problems of shared-method bias, we analyzed friend selection and influence processes simultaneously over time.

Longitudinal social network analyses revealed several important findings. First, early adolescents' selection and influence of friends played an important role in the development of their aggressive behavior in the classroom. Fifth and sixth graders became more similar to their friends in terms of aggressive behavior over a 5-month period, and this similarity was due to friend selection and influence effects. Our findings are in line with other studies on friendship processes of aggressive behavior(e.g., Dijkstra, Berger, & Lindenberg, 2011; Rulison, Gest, & Loken, 2013; Shin, 2017a; Sijtsema et al., 2010b) and lend further support to theoretical and empirical work on the importance of friends in aggressive behavior(Dishion, Patterson, & Griesler, 1994; Espelage, Holt, & Henkel, 2003). Fifth and sixth graders were strongly attracted to peers who were similarly aggressive, and were influenced by their friends' aggressive behavior over time. These findings suggest that youth self-select group of friends based on their own level of aggression, and over time they develop into higher level of aggressive behavior due to friend influence. Considering the increasing trend of early adolescents' aggressive behavior and severe consequences of aggression for youth's physical and psycho-social health (Gini & Pozzoli, 2009; Hawker & Boulton, 2003; Ttofi et al., 2011), teachers and educators may need to attend to friendship dynamics in the classroom to effectively intervene youth's

aggressive behavior.

Second, early adolescents' social goals, especially dominance goals, moderated friend selection based on aggressive behavior. When fifth and sixth graders have dominance goals, they were more attracted to and formed friendships with aggressive peers in the classroom. These findings are in line with prior work that has suggested that having dominance goals(i.e., focusing on having power over peers) play a key role in motivating youth's aggressive behavior(Ojanen, Findley, & Fuller, 2012; Ojanen, Grönroos, & Salmivalli, 2005; Rodkin et al., 2013), but further suggest that youth's dominance goals also have implications in friendship dynamics around aggressive behavior. The fact that fifth and sixth graders' dominance goals enhanced their friend selection of aggressive peers suggests that youth's social goals indeed provide an important standard for selecting friends among early adolescents. For youth who focus on having power over peers, it makes sense that they would be more attracted to aggressive peers as aggression is often related to a high social status or dominance(Caravita & Cillessen, 2012; Garandeau & Cillessen, 2006). Although fifth and sixth graders' dominance goals did not magnify friend influence on aggressive behavior in the current results, their stronger attraction toward aggressive peers would put these youth at a further disadvantage, leading to a higher level of aggression given that we found evidence for strong friend influence on aggressive behavior.

Contrary to our expectation, youth's popularity and intimacy goals did not moderate friend selection and influence on aggressive behavior. Youth's intimacy goals may be less relevant to friendship dynamics of aggression. Rather, their focus on establishing and maintaining intimate relationships(Jarvinen & Nicholls, 1996) would matter more in regards to pro-social behavior, such as helping, cooperating, and sharing with peers(Shin & Ryan, 2012). Indeed, we found that fifth and sixth graders who have intimacy goals were strongly attracted to and formed friendships with peers who have similar levels of intimacy goals in the current results. Future studies that examine the role of intimacy goals in friendship dynamics around pro-social or cooperative behavior may elucidate these processes. Likewise, youth's popularity goals may be more relevant to friendship dynamics around more covert forms of aggression such as relational aggressive behavior. Prior work has suggested that youth's popularity is more strongly associated with relational aggression compared to overt and physical aggression during this developmental stage(Cillessen & Rose, 2005; Shin, 2017b). As youth become more adept at social skills, they may not use discernable aggressive behavior to enhance their social status. Instead, early adolescents use more covert forms of aggressive behavior as an appropriate way to get back at peers or maneuvering peer relationships(Godleski &

Ostrov, 2010). Future studies that assess various forms of aggressive behavior may better explain how youth's social goals differentially affect friendship dynamics around aggressive behavior.

Lastly, in line with previous findings that have shown consistent gender differences in terms of expectations in social interactions and behavioral characteristics(Ojanen, Findley, & Fuller, 2012; Ojanen, Grönroos, & Salmivalli, 2005; Rose & Rudolph, 2006), fifth and sixth graders' gender and dominance goals played a role in the development of their aggressive behavior. Fifth and sixth graders who have dominance goals and boys became more aggressive over time. Further, fifth and sixth graders were more likely to form friendships when they had mutual relationships(i.e., reciprocity) and had shared friends(i.e., transitivity), and with classmates of the same gender. It is noteworthy that we controlled for these confounding factors in the current study to understand the unique role of selection and influence of friends on youth's aggressive behavior. Our use of longitudinal social network analysis allowed a more rigorous test of friend selection and influence effects across time, controlling for network structural effects and covariates that could play a role. These features give us greater confidence that the effects of selection and influence of friends on aggressive behavior are accurate and not conflated with structural features of youth's friendships, effects of gender, and social goals.

Although our work provides many insights, there are limitations that need to be noted and possibly addressed in future work. First, the fact that our study was classroom based yielded friend networks that were too small in size to analyze our SIENA results with meta-analysis, which would have allowed us to examine whether friendship processes vary by classroom and are affected by classroom group features. Future studies with larger class sizes may attempt to replicate our study with meta-analyses, so that class-level variation can be taken into account. Further, future studies could also include other group-level variables such as the socio-economic status(S.E.S.) of the students or geographic location of the schools. Second, the current study focused on physical aggression, and relational aggression was not included. It would be important in future studies to specifically examine if youth's popularity goals are associated with friendship dynamics around relational aggression given that a number of researchers have found that relational aggression is more relevant to popularity goals during adolescence(Kiefer & Ryan, 2008, Rodkin et al., 2013). Third, we only examined changes across one school year. Future work that follows the same cohort of youth across multiple years could be informative of how youth's friendship dynamics and behaviors change from early adolescence through late adolescence against the backdrop of changing school contexts.

Despite the limitations in the current study,

our findings make several contributions to the literature and provide practical implications for teachers and educators who try to intervene and prevent aggression. Adolescents' selection and influence of friends play an important role in the development of youth's aggression in the classroom, which suggests that preventing the establishment of antisocial relationships as well as disrupting relationships built around aggression would be critical to prevent further aggression. Youth's social goals play a critical role in the friendship dynamics of aggression. When youth focus on having dominance and power over peers, youth are more likely to form friendships with aggressive peers and became more aggressive over time. Prior research has emphasized the significant role of teachers in youth's beliefs and behaviors as well as peer dynamics in the classroom(Luckner & Pianta, 2011; Shin & Ryan, 2017; Shin, 2018b). Teachers' explicit focus and emphasis on intimacy goals could encourage youth's social interactions around prosocial behavior. When teachers are mindful about adolescents' beliefs and friend social networks in relation to aggression, they can exert influence on classroom social dynamics utilizing peer network information and be more effective in intervening aggressive behavior and promoting pro-social behavior within schools and classrooms.

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원 고 접 수 일 : 2018. 06. 04.
수정원고접수일 : 2018. 09. 12.
최종게재결정일 : 2018. 10. 08.

한국심리학회지: 학교
The Korean Journal of School Psychology
2018, Vol. 15, No. 3, 307-329

종단적 사회연결망 분석을 통해 살펴본 청소년의 관계 지배적 목표가 공격 행동의 또래 상호 작용에 미치는 영향

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본 연구는 청소년의 사회 관계적 목표가 공격 행동에 대한 친구 선택과 친구 사회화 과정에 어떠한 조절 역할을 하는지 살펴보았다. 이를 위해 충청도 지역 초등학교 5-6학년, 26 학급, 677-736명의 학생을 대상으로, 교사 보고를 통해 청소년의 공격 행동을, 또래 보고를 통해 청소년의 친구 관계 네트워크를, 자기 보고를 통해 청소년의 사회 관계적 목표를 학기 초와 학기 말에 걸쳐 측정하였다. 종단적 사회연결망 분석을 통해 살펴본 결과, 청소년은 공격 행동이 비슷한 또래를 친구로 선택하고, 지속적인 관계를 통해 친구의 공격 행동을 적극적으로 사회화하는 것으로 나타났다. 또한, 청소년의 사회 지배적 목표는 이러한 친구 선택 및 친구 사회화 과정에 중요한 영향을 주는 것으로 나타났다. 사회 지배적 목표가 높은 청소년은 공격성이 높은 또래를 적극적으로 친구로 선택하고, 학기가 진행됨에 따라 더욱 높은 공격 행동을 보이는 것으로 나타났다. 이러한 결과는 청소년의 공격 행동과 또래 관계를 살펴보는데 있어 청소년의 사회 관계적 목표를 고려해야 할 필요성을 시사한다.

주요어 : 친구 관계, 사회 관계적 목표, 공격 행동, 청소년, 사회 연결망

부록. 한국어판 사회적 목표 문항

나는 또래 친구들과 함께 있을 때, _____ 라면 매우 좋을 것 같다.

1. 친구들이 나를 무서워한다면
2. 친구들에게 내가 원하는 것을 강압적으로 잘 시킬 수 있다면
3. 친구들이 내가 마음만 먹으면 그들을 혼내줄 수 있다고 생각한다면
4. 친구들이 내가 그들보다 힘이 세고 싸움을 잘 한다고 생각한다면
5. 친구가 내 마음을 잘 이해해준다면
6. 내가 친구들을 많이 도와줄 수 있다면
7. 내가 친구들을 즐겁게 해줄 수 있다면
8. 내가 친구들의 마음을 잘 헤아려 줄 수 있다면
9. 내가 제일 인기있는 사람이라면
10. 모든 아이들이 나와 친해지고 싶어한다면
11. 친구들이 다른 아이들보다 나를 제일 좋아한다면