Links between nonshared friendship experiences and adolescent siblings’ differences in aspirations

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Aspirations
Friendships
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ABSTRACT

Using a sibling design, this study examined the association between adolescents’ friendship experiences and their aspirations for self-acceptance, affiliation, and financial success. We hypothesized that adolescent siblings would differ in their aspirations and that unique experiences in friendships would be associated with these differences. Within our sample of 102 same-sex sibling pairs (mean age older sibling 16 years, younger sibling 14 years), only a small degree of sibling similarity was found for aspirations as well as friendship experiences. Self-acceptance and affiliation were positively linked to general friendship positivity as well as to positive features of the adolescents’ closest friend. Bivariate model-fitting techniques revealed that nonshared processes (i.e., unique to each child in the family) explained these links between friendship experiences and aspirations. The results indicate that growing up in one home and being socialized by the same parents does not make adolescent siblings similar in their aspirations but rather that nonshared experiences like those with close friends are related to aspiration dissimilarity of siblings.

Aspirations are personal values that imply an individuals’ desired state of being and guide his or her behavior towards that state. The development of these personal values is assumed to unfold mainly within the family context, with parents being regarded as highly important agent of socialization of values (Whitbeck & Gecas, 1988). This would imply that two children brought up in the same home by the same parents should resemble each other regarding their aspirations. However, sibling studies have usually revealed that children from one family are largely dissimilar with regards to personality traits, psychopathology, and cognitive ability (for a review see Plomin, Asbury, & Dunn, 2001). This indicates that there must be nonshared effects, such as nonshared genes or unique environmental influences that make siblings in the same family different from each other. Experiences and social interactions from within and outside of the family are nonshared environment candidates, with peer group and friendships certainly being of particular importance for cognitive and moral development, which act as foundations for aspirations in adolescence (Bukowski & Sippola, 1996; W.H. Hartup, 1996; W.W. Hartup, 1996).

Behavioral genetic research has found impressive evidence for the significant impact of nonshared environmental factors on differences between siblings. As mentioned above, normative, i.e., non-twin sibling pairs are less similar in their personalities and cognitive abilities than sharing approximately half of their genes as well as growing up in the same family would imply. In addition, sibling resemblance in these areas is mostly due to shared genes rather than shared environment. From the early 1980s on, scholars concentrated on identifying those factors that are experienced differently by children within one family (i.e., factors that are nonshared) and are related to differences in outcome measures such as adjustment and psychopathological disorders in childhood and adolescence (for a review see Turkheimer & Waldron, 2000).

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The primary focus of this research has been the family, and especially (perceived and real) differential parental treatment. Results from these studies have shown that differences between siblings in some outcome measures are indeed related to child-specific parenting (e.g., Boyle et al., 2004; Sheehan & Noller, 2002). It is noteworthy that similar findings have been reported regardless of informant (for reviews on the topic as a whole and especially on applied measurement techniques see Plomin, Chipuer, & Neiderhiser, 1994; Turkheimer & Waldron, 2000). However, parental differential treatment only accounts for a small percentage of children’s and adolescents’ outcomes, leaving other factors worth examining.

There is consensus that, not only is the within–family environment (i.e., the parent–child and sibling relationships) not perceived equally by siblings, but that the nonshared experience of extrafamilial networks is also related to sibling differences in outcomes (Dunn & Stocker, 1989; Pike & Plomin, 1997; Plomin & Asbury, 2005; Plomin et al., 2001). Pike and Plomin (1997), for example, suggested that friendship quality in adolescence in particular might be a candidate for nonshared environment that is linked to differences in outcomes. In their review of literature on friends and peer groups as nonshared environmental influences, Rowe, Woulbroun, and Gulley (1994) suggested that although the selection of friends is itself a nonshared process driven by genetically or environmentally influenced differences between siblings, friends also reinforce differences. Rowe and colleagues concluded that friends and peers are an effective nonshared environment in that they produce (to a lesser degree) but also amplify (to a greater degree) sibling differences in personality and behavior. Although there is evidence of genetic influences on aspects of adolescents’ social relationships, most of the variation in friendship quality is ascribed to (nonshared) environmental components (Iervolino et al., 2002; Manke, McGuire, Reiss, Hetherington, & Plomin, 1995). Thus, the scope of the current study was to examine friendship experiences in adolescence as a possible process that is likely to have unique aspects for each sibling. We examined friendship quality in adolescence as a possible nonshared source of differences in siblings’ aspirations; an outcome measure that has not yet been studied using a sibling design.

The socialization of aspirations as personal values that define a desired future state is traditionally ascribed to parents, suggesting that siblings share aspirations. Value transmission research has shown that values of parents and their children are correlated to a modest to moderate degree (usually around \( r = .20–.30 \); see, for example, Albert & Trommsdorf, 2003; Schönpfugl, 2001). Studies of family impact on adolescents’ educational and occupational aspirations confirmed parental impact, but also showed that the family environment does not explain all of the variance in adolescents’ aspirations and values (e.g., Davies & Kandel, 1981; Hitlin, 2006; Teachman & Paasch, 1998). Biddle, Bank, and Marlin (1980) have argued that the impact of parents versus peers depends on the topic. Social domains theory (Smetana, 1997, 1999) supports the view that individuals gain and apply different kinds of knowledge in changing social contexts. Certain values might therefore be transmitted from parents (i.e., within the family), whereas others might be a result of social interaction with peers and friends. It has been shown that interactions within friendships facilitate various developmental tasks in childhood and adolescence (W.H. Hartup, 1996; W.W. Hartup, 1996) and the impact of friends on risky health and deviant behavior (Prinstein, Boergers, & Spirito, 2001) and school adjustment (Berndt, Hawkins, & Jiao, 1999; Wentzel, Barry, McNamara, & Caldwell, 2004; Wentzel & Caldwell, 1997) has been well-documented. However, links between perceived quality of friendships and adolescents’ aspirations, values, or goals has thus far only been examined with regard to academic and school-related social goals, revealing a significant link between positive friendship experiences and social goals that enhance intimacy with peers (Summers, 2002).

A major shortcoming of these studies is that only one child per family has been studied. This leaves unanswered whether siblings share values to a greater or lesser extent than do parents and children, and whether the link between friendships and aspirations is mediated by shared or nonshared processes. One child per family designs make it impossible to trace shared and nonshared effects although a growing body of literature on parental differential treatment and sibling differences in outcome has shown that parents and parent–child relationships are not the same for all children in a family (e.g., Dunn, Stocker, & Plomin, 1990) and differentiating effects on values and aspirations are likely. We propose that relationships originating outside the family are likely to provide even greater differentiation of siblings than are within-family relationships.

It is, of course, also possible that sibling differences in extra-familial relationships linked to sibling differences in outcome may be due to nonshared genes rather than, or in addition to, nonshared environment. That is, specific genetically influenced traits of the child might explain variance both in friendship quality and also in aspirations. Such genetic – similarly to environmental – mediation can be shared or nonshared by siblings. The model proposed in the current study combines genetic and environmental effects in decomposing variance into shared and nonshared proportions. Although it is not possible to infer genetic versus environmental effects, this model is particularly useful for “garden-variety” sibling studies, which are far more common (and arguably more generalizable) than twin or adoption studies. Prior to testing whether the association between friendships and aspirations is mediated by shared (genetic and environmental) or nonshared (genetic and environmental) processes, we examined whether friendships are indeed experienced differently by siblings. Similarly, sibling resemblance in aspirations was explored, and variance attributed to shared and nonshared factors.

To sum up, the current study addressed the question of whether differences in siblings’ close friendship experiences act as an extra-familial nonshared environmental correlate of differential sibling aspirations during adolescence. A sibling design was applied to test the hypotheses that 1) aspirations are mainly nonshared by siblings, and 2) that friendships in adolescence are a nonshared social context that is associated with siblings’ unique aspirations.
Method

Sample and procedure

A total of 102 same-sex (47 male, 55 female) adolescent sibling pairs were recruited through an existing register at the Institute of Psychiatry, London, England, as well as via snowballing; families were asked to nominate other families that they thought may be willing to participate. The older siblings in the sample were between 12.5 and 19 years old (average = 16 years) and the age of the younger siblings ranged from 11 to 17 years (average = 14 years). The mean age spacing of siblings was 2.23 years (SD = 1.13 years). The sample was predominantly Caucasian and middle-class; there was, however, variation in parents’ education with several parents not having finished secondary school and others who had completed postgraduate degrees. The participants lived in various regions in the United Kingdom and data were collected by sending out questionnaire booklets by post, with an enclosed stamped and addressed envelope to return the questionnaires after completion. All participants received a £5 record token as a small thank you. The abbreviations OS for older siblings and YS for younger siblings will be used throughout.

Measures

Aspiration Index (Kasser & Ryan, 1993). This 14-item questionnaire measures the importance of possible future events to adolescents in four domains: self-acceptance (e.g., ‘You will know and accept who you really are’), affiliation (e.g., ‘You will share your life with someone you love’), community feeling (e.g., ‘You will teach others the things you know’), and financial success (e.g., ‘You will have a job that pays well’). The items were rated on a four-point scale, ranging from 1 = not at all important to 4 = very important. Reliability analyses revealed a low estimate for the community feeling scale (Cronbach’s alpha = .25 for OS and .37 for YS), which was consequently omitted from further analyses, and a better reliability for the financial success scale when the item ‘You will be your own boss’ was deleted (alpha = .59 for OS and .43 for YS before and .60 for OS and .52 for YS after item deletion). After these adjustments, internal consistency was moderate to good, ranging from alpha = .52–.72. It should be noted that these alphas are reasonable when the small number of items per subscale is considered (Cortina, 1993).

Friendship quality

Friendship Quality Questionnaire (Parker & Asher, 1993). This 40-item questionnaire assesses six different aspects of friendship: validation and caring (e.g., ‘My best friend makes me feel good about my ideas’), conflict resolution (e.g., ‘We talk about how to get over being mad at each other’), conflict and betrayal (e.g., ‘My best friend and me argue a lot’), help and guidance (e.g., ‘My best friend gives advice with figuring things out’), companionship and recreation (e.g., ‘We do fun things together a lot’), and intimate exchange (e.g., ‘We always tell each other our problems’). Adolescents were asked to indicate on a five-point scale how true each statement was in reference to their relationship with their best friend. The internal consistency estimates for these subscales were moderate to good, ranging from alpha = .54–.87.

Close Friendship Characteristics (Windle, 1994). This 15-item scale indexes the frequency and severity of events in a close friendship. Adolescents are asked to answer each occurrence as having never happened, happened once, happened twice, or happened more than twice. Thereby, four aspects of close relationships are measured, namely lack of reciprocity (e.g., ‘Close friend would not help me’), overt hostility (e.g., ‘Close friend criticized me’), covert hostility (e.g., ‘I believed a rumor about my best friend’), and self-disclosure (e.g., ‘I told my close friend a secret’). The internal consistency of most subscales ranged from alpha = .70 to .87, however, a lower reliability was yielded for younger siblings’ ratings of covert hostility (alpha = .54).

Given that the Friendship Quality Questionnaire and Close Friendship Characteristic questionnaire cover similar domains within friendships, and single subscales from both measures correlated moderately to highly, composite scores were calculated. A principal component factor analysis of all subscales indicated that a two-factor solution best represented friendship dimensions for both siblings, with the two factors clearly representing positivity and negativity within friendships. The positivity factor was formed by summing the subscales validation and caring, help and guidance, companionship and recreation, intimate exchange, and self-disclosure. The negativity factor included conflict and betrayal, lack of reciprocity, and overt as well as covert hostility. The internal consistency estimates of the friendship composites were very good, alpha = .89 and .95, respectively.

Adolescent Interpersonal Competence Questionnaire (AICQ, Buhrmester, 1990). This 40-item questionnaire asks adolescents to assess a close friend’s competence in areas important to the initiation and maintenance of relationships. Participants rated how good their closest friend was at initiating relationships, providing emotional support, asserting influence, self-disclosure, and conflict resolution. The internal consistency for these scales was good for both siblings with Cronbach’s alpha ranging from .80 to .87 for older siblings and .81–.88 for younger siblings.

Results

Preliminary analyses

We first computed descriptive statistics (see Table 1) and tested for differences between males and females among all study measures. Significant gender differences were found for the affiliation measure for older siblings, and friendship positivity, friend’s emotional support, assertion of influence, and self-disclosure for younger siblings. Effect sizes were calculated and
indicated that these gender effects were small to moderate in magnitude ($r = .20–.36$). Given that our subsequent analyses require sample sizes well above $N = 50$, the sample was analyzed as a whole instead of separately for males and females.

Next, correlations between aspirations and friendship measures were computed, revealing significant links for older and younger siblings between aspirations for self-acceptance and affiliation with the friendship dimensions of friendship positivity, emotional support by friend, and self-disclosure by friend. We also found the aspiration for affiliation was correlated with friend’s ability to initiate relationships and assert influence, though only for the younger siblings. It should be noted that only the younger siblings’ experience of close friends’ ability to resolve conflicts was related to the aspiration for financial success (Table 2). In sum, 14 out of 42 correlations were significant ($p < .05$).

**Univariate analyses**

In order to address our first hypothesis, namely that aspirations are nonshared by siblings, we calculated shared and nonshared components of variance for siblings’ aspirations for self-acceptance, affiliation, and financial success, as well as for all friendship measures. Univariate models were computed, using the model-fitting program Mx (Neale, Boker, Xie, & Maes, 2003). A significant advantage of model-fitting techniques compared to conventional correlational analyses is that not only are shared and nonshared components of variance estimated, the degree to which the model fits the data is also calculated. The model in the current analysis consisted of two observed variables (older and younger siblings’ scores on a measure) and three latent variables (see Fig. 1). Taking the example of self-acceptance, the observed variables therefore represent $OS_{0}$ and $YS_{0}$ ratings on that aspirations, $N$ stands for the nonshared component of variance (i.e., unique to each siblings rating on the measure) and also includes measurement error. The third latent variable ($S$) represents the shared component of variance (i.e., overlap in variance between siblings).

Separate models were calculated for all three aspirations, yielding model statistics as well as estimates of shared and nonshared components of variance for all three aspirations (see Table 3). It should be noted that all path coefficients in these models are standardized and therefore represent the percentage of variance that is explained by shared and nonshared components. Shared components were small and non-significant for self-acceptance and affiliation. However, almost one third of the variance for financial success was explained by shared factors. Nonshared components though explained approximately 90% of variance in aspirations for self-acceptance and affiliation. The same strategy of decomposing variance between siblings into shared and nonshared components was applied to friendship measures. As hypothesized, variance in

### Table 1
Descriptive statistics of all study measures.

<table>
<thead>
<tr>
<th></th>
<th>Older siblings</th>
<th></th>
<th>Younger siblings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>SD</td>
<td>$M$</td>
<td>SD</td>
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<tr>
<td><strong>Aspirations</strong></td>
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<tr>
<td>Self-acceptance</td>
<td>3.50</td>
<td>.45</td>
<td>3.45</td>
<td>.45</td>
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<tr>
<td>Affiliation</td>
<td>3.28</td>
<td>.75</td>
<td>3.38</td>
<td>.60</td>
</tr>
<tr>
<td>Financial success</td>
<td>3.04</td>
<td>.70</td>
<td>2.95</td>
<td>.69</td>
</tr>
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<td><strong>Friendship</strong></td>
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<td></td>
</tr>
<tr>
<td>Positivity</td>
<td>−.002</td>
<td>.63</td>
<td>.001</td>
<td>.61</td>
</tr>
<tr>
<td>Negativity</td>
<td>.0002</td>
<td>.61</td>
<td>−.001</td>
<td>.61</td>
</tr>
<tr>
<td>Initiating</td>
<td>3.48</td>
<td>.80</td>
<td>3.36</td>
<td>.78</td>
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<tr>
<td>Emotional support</td>
<td>3.44</td>
<td>.71</td>
<td>3.36</td>
<td>.78</td>
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<tr>
<td>Asserting influence</td>
<td>3.60</td>
<td>.67</td>
<td>3.51</td>
<td>.71</td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>3.26</td>
<td>.74</td>
<td>3.27</td>
<td>.86</td>
</tr>
<tr>
<td>Conflict resolution</td>
<td>3.23</td>
<td>.67</td>
<td>3.38</td>
<td>.67</td>
</tr>
</tbody>
</table>

### Table 2
Correlations between aspirations and friendship experiences.

<table>
<thead>
<tr>
<th></th>
<th>Self-acceptance</th>
<th></th>
<th></th>
<th></th>
<th>Affiliation</th>
<th></th>
<th>Financial success</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>OS</td>
<td>YS</td>
<td></td>
<td>OS</td>
<td>YS</td>
<td></td>
<td>OS</td>
<td>YS</td>
</tr>
<tr>
<td>Positivity</td>
<td>.28**</td>
<td>.33**</td>
<td>.28**</td>
<td>.24*</td>
<td>.16</td>
<td>−.02</td>
<td>.02</td>
<td>−.03</td>
</tr>
<tr>
<td>Negativity</td>
<td>.04</td>
<td>−.08</td>
<td>−.13</td>
<td>.04</td>
<td>−.05</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiating</td>
<td>.15</td>
<td>.19</td>
<td>−.05</td>
<td>.23*</td>
<td>.02</td>
<td>−.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional support</td>
<td>.22*</td>
<td>.25*</td>
<td>.29**</td>
<td>.19</td>
<td>.11</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asserting influence</td>
<td>.10</td>
<td>.15</td>
<td>−.05</td>
<td>.29**</td>
<td>−.10</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>.17</td>
<td>.24*</td>
<td>.22*</td>
<td>.31**</td>
<td>.08</td>
<td>−.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict resolution</td>
<td>.16</td>
<td>.17</td>
<td>.21*</td>
<td>.14</td>
<td>.13</td>
<td>−.24*</td>
<td></td>
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</tr>
</tbody>
</table>

Note: **$p < .01$, *$p < .05$.**
close friendship experiences was also largely explained by nonshared components with six out of seven models revealing no significant shared components. However, 30% of variance for friendship negativity was explained by the shared factor.

Two models (affiliation and self-disclosure) yielded unsatisfactory model fits. Given that the model assumes equal variances and covariances for both siblings, we tested whether this assumption was responsible for the lack of fit using correlation instead of covariance matrices. This resulted in a good model-data fit for both models, suggesting that differences in variance between the two siblings caused the lack of fit.

To sum up our first analyses, our hypothesis that nonshared factors would dominate in explaining variance with regard to aspirations and experiences in close friendships was supported. Simply put, these results indicate a lack of similarity between adolescent siblings in terms of both their friendships and their aspirations.

**Bivariate analyses**

Our second aim was to decompose the covariance between friendship experiences and aspirations into shared and nonshared elements. In order to do so, friendship experiences and aspirations must be significantly associated with one another to a moderate degree. Our model-fitting analyses included all links between aspirations and friendship experiences that were related at \( p < .05 \) for at least one sibling and at \( p < .10 \) level for the other sibling, resulting in six models: self-acceptance and friendship positivity, self-acceptance and emotional support, self-acceptance and self-disclosure, as well as affiliation and friendship positivity, affiliation and emotional support, and, finally, affiliation and self-disclosure.

Fig. 2 represents the full bivariate model with 12 latent and 4 observed variables. The two latent shared variables represent the component of variance that is shared by siblings. The curved double-headed arrow between the two shared components is set to 1.0 to represent the perfect correlation. The two other latent variables (nonshared) represent the components of variance linking self-acceptance and friendship positivity that are not shared by siblings. The remaining eight residual latent variables reflect shared and nonshared components of variance that are unique to each measure. If a pair of paths that connects two observed variables via a latent variables (Shared or Nonshared) are both significant, this indicates that this latent variable contributes significantly to the correlation between the aspiration and the friendship measures. In consideration of our hypothesis that the correlation between friendship experiences and aspirations is accounted for by nonshared processes, we expected the pair of paths linking friendship and aspiration via the common nonshared component to be

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**Table 3**

Univariate model-fitting results.

<table>
<thead>
<tr>
<th></th>
<th>Shared % of variance</th>
<th>Nonshared % of variance</th>
<th>Chi² value</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aspirations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-acceptance</td>
<td>.11 (.00–.30)</td>
<td>.89* (.70–1.00)</td>
<td>.002</td>
<td>.000</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.07 (.00–.26)</td>
<td>.93* (.74–1.00)</td>
<td>4.61*</td>
<td>.193</td>
</tr>
<tr>
<td>Financial success</td>
<td>.27* (.07–.44)</td>
<td>.73* (.56–.93)</td>
<td>.01</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Friendship experiences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendship positivity</td>
<td>.09 (.00–.28)</td>
<td>.91* (.72–1.00)</td>
<td>.10</td>
<td>.000</td>
</tr>
<tr>
<td>Friendship negativity</td>
<td>.30* (.11–.47)</td>
<td>.70* (.53–.89)</td>
<td>.00</td>
<td>.000</td>
</tr>
<tr>
<td>Initiating relationships</td>
<td>.00 (.00–.13)</td>
<td>1.00* (.87–1.00)</td>
<td>.84</td>
<td>.000</td>
</tr>
<tr>
<td>Emotional support</td>
<td>.08 (.00–.27)</td>
<td>.92* (.73–1.00)</td>
<td>1.00</td>
<td>.007</td>
</tr>
<tr>
<td>Asserting influence</td>
<td>.16 (.00–.35)</td>
<td>.84* (.65–1.00)</td>
<td>.29</td>
<td>.000</td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>.05 (.00–.24)</td>
<td>.95* (.76–1.00)</td>
<td>2.19</td>
<td>.111</td>
</tr>
<tr>
<td>Conflict resolution</td>
<td>.15 (.00–.34)</td>
<td>.85* (.66–1.00)</td>
<td>.07</td>
<td>.000</td>
</tr>
</tbody>
</table>

*Note. Confidence intervals are depicted in brackets. *\( p < .05 \).*
significant. Should the pair of paths that links the two measures via the common shared component be significant, then shared processes are implicated in the link between friendship and aspiration.

Fig. 3 represents only one half of the model, which is sufficient given that both siblings are constrained to have equal values. Concerning the association between self-acceptance and friendship positivity, the paths that link both measures via the nonshared component were both significant (.69 and .26), though not those paths linking these measures via the shared component (.36 and .34). Note that the values in Fig. 2 are constrained to be the same for OS and YS, hence only included once. Given that all path coefficients in this model are standardized, the extent to which shared and nonshared components explain the correlation between self-acceptance and friendship positivity can be calculated. To do this, the path coefficients linking both measures via the latent factors are multiplied. For the current model this yielded an estimation of contributing shared factors of .12 (.36 \times .34) and a slightly higher contribution of nonshared factors of .18 (.69 \times .26). Summing these estimates reveals the model's estimate of the correlation of between self-acceptance and friendship positivity, \( r = .30 \). The estimates for shared and nonshared contributions can then be divided by the model's estimate of the correlation to calculate the percentage contribution from shared and nonshared processes. Within the current model, 40% shared and 60% nonshared processes accounted for the link between self-acceptance and friendship positivity.

![Diagram](https://example.com/diagram.png)
Table 4 contains the standardized path estimates for all six models. The associations between aspirations (self-acceptance and affiliation) and friendship experiences (friendship positivity, emotional support, and self-disclosure) were primarily nonshared with the exception of the affiliation – friendship positivity association, for which no significant contribution by shared or nonshared components was detected. The association between self-acceptance and friend’s emotional support and self-disclosure was explained exclusively by nonshared processes, whereas the link between affiliation and these two characteristics of the close friend were mediated by up to one third shared factors. Table 4 also includes confidence intervals for each estimate, which are comparably large because of the small sample size. Constraints of the model do not allow upper boundaries of confidence intervals to be larger than 1.00. A lower bound value of .00 indicates that the respective estimate is statistically non-significant.

Two of six models did not show a satisfactory fit to the data as was indicated by significant Chi² values and RMSEAs > .08 (Byrne, 2001). As mentioned above, the models in the present study used cross-sibling covariances to decompose the variance between a friendship measure and an aspiration into shared and nonshared components. Again, we tested the assumption that variance differences between older and younger siblings were responsible for the lack of fit of these models using correlations matrices. This resulted in a satisfactory model-data fit, which indicates that differences in variance between the two siblings caused the lack of fit.

Discussion

Although typical sibling studies cannot disentangle genetic and environmental effects, they are useful in assessing shared and nonshared processes within ordinary families, and do not include the limitations of twin and/or adoption studies (i.e., issues surrounding generalizability). The sibling model proposed in the current study is particularly suited for use with typical data from sibling pairs. Applying uni- and bivariate model-fitting techniques, we examined whether aspiration in the three domains of financial success, affiliation, and self-acceptance are nonshared between adolescent siblings, and how these are related to their friendship experiences. Our hypotheses that siblings’ ratings of friendship experiences and aspirations would be largely dissimilar, and that nonshared effects would mediate links between friendship experiences and aspirations were mainly confirmed: little similarity between siblings with regard to aspirations and friendship experiences was detected, and associations between aspirations and friendship experiences were mainly accounted for by nonshared factors.

These findings are in line with previous behavioral genetic research, in which differences between siblings have been repeatedly detected. However, our findings might challenge traditional assumptions about the role of the family in the development of aspirations and values. Parents are usually recognized as important agents of their offspring’s values and aspirations (Whitbeck & Gecas, 1988), an assumption that theoretically implies a certain degree of congruence in values and aspirations between siblings who grow up in one household. This congruence, though, was not detected in the current study. The siblings in our sample were not more similar in their aspirations than siblings are with regards to personality, psychopathology, and cognitive abilities (Plomin & Daniels, 1987), their reports of perceived parental treatment (Reiss et al., 1994), and their interactions with peers and teachers (Manke et al., 1995). Smetana’s (1997, 1999) social domains theory offers a possible explanation for our findings. That is, children and adolescents interact in different social contexts in which they acquire different types of knowledge. Therefore, it may be that particular aspirations are developed in the family context whereas others are developed in friendship settings. The small to moderate degree of variance in adolescents’ values and aspirations that is congruent with parents’ values (Albert & Trommsdorf, 2003; Schönpfleg, 2001) supports this interpretation because it clearly leaves a large proportion of adolescents’ aspirations unexplained.

After detecting the dissimilarity between siblings’ aspirations, our next step was to identify experiences that are unique to each sibling and associated with his or her aspirations. Although several sources of nonshared aspirations are conceivable, we examined friendship experiences – an extra-familial dimension of nonshared environment that becomes increasingly important during adolescence. Close friends are perceived as highly supportive (Buhrmester & Furman, 1992) and as companions more important than parents (Buhrmester & Furman, 1987). Particularly in adolescence friends are an important social environment likely to shape and reinforce young people’s goals, aspirations, and values. Although Rowe et al. (1994) reported that adolescent same-sex siblings have some overlap in their circles of friends, our results have shown that friendships are an important source of nonshared environment. Precisely, we hypothesized different experiences with best friends to be associated with differences in siblings’ aspirations. The results of our bivariate models indeed suggest that nonshared factors are largely responsible for this link, a finding that can be interpreted in several ways. First, it is possible that different friendships of adolescent siblings “lead” to divergent aspirations of siblings. On the other hand, however, it is also conceivable that certain aspirations contribute to friend selection. Rowe et al.'s (1994) review of studies on whether similarity between friends is due to selection or influence and concluded that both processes operate. A further possibility of explaining the impact of nonshared factors on the link between friendship experiences and aspirations is that a third – nonshared – variable mediates the link. That is, experiences or characteristics unique to each sibling, such as differential parenting experiences or adolescents’ differing personalities may account for sibling differences in both friendships and aspirations. Differences in personality traits, for example, have been linked to goals in life (Robert & Robins, 2000) as well as experiences in close relationships (Asendorpf & van Aken, 2003). Temperament is substantially influenced by genes (Saudino, McGuire, Reiss, Hetherington, & Plomin, 1995) and mediates associations between sibling relations and friendships (Pike & Atzaba-Poria, 2003). Similar processes may be present in the current study. Equally likely is the assumption that other environmental factors such as adolescents’ classroom environments affect both friendships and aspirations. Classroom or school climate vary
Table 4
Bivariate model-fitting path coefficients and estimates.

<table>
<thead>
<tr>
<th></th>
<th>$S_{FR}$</th>
<th>$S_{ASP}$</th>
<th>$N_{FR}$</th>
<th>$N_{ASP}$</th>
<th>$s_{FR}$</th>
<th>$s_{ASP}$</th>
<th>$n_{FR}$</th>
<th>$n_{ASP}$</th>
<th>PC</th>
<th>Shared %</th>
<th>Nonshared %</th>
<th>Chi²</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-acceptance &amp; friendship positivity</td>
<td>.34 (.00–.54)</td>
<td>.36 (.00–.56)</td>
<td>.26* (.04–1.00)</td>
<td>.69* (.04–1.00)</td>
<td>.90 (.00–.98)</td>
<td>.30 (.04–.41)</td>
<td>.63 (.00–.42)</td>
<td>.63 (.00–.98)</td>
<td>.79</td>
<td>40</td>
<td>60</td>
<td>.79</td>
<td>.000</td>
</tr>
<tr>
<td>Self-acceptance &amp; emotional support</td>
<td>.13 (.00–.52)</td>
<td>.00 (.00–.55)</td>
<td>.46* (.07–1.00)</td>
<td>.51* (.07–1.00)</td>
<td>.26 (.00–.99)</td>
<td>.84 (.00–.52)</td>
<td>.34 (.00–.58)</td>
<td>.79 (.00–.99)</td>
<td>.23</td>
<td>–</td>
<td>100</td>
<td>1.08</td>
<td>.000</td>
</tr>
<tr>
<td>Self-acceptance &amp; self-disclosure</td>
<td>.11 (.00–.51)</td>
<td>.00 (.00–.57)</td>
<td>.40* (.08–1.00)</td>
<td>.55* (.08–1.00)</td>
<td>.25 (.00–.51)</td>
<td>.87 (.00–.51)</td>
<td>.38 (.00–.57)</td>
<td>.75 (.00–.99)</td>
<td>.22</td>
<td>–</td>
<td>100</td>
<td>3.23</td>
<td>.081</td>
</tr>
<tr>
<td>Affiliation &amp; friendship positivity</td>
<td>.36 (.00–.55)</td>
<td>.34 (.00–.53)</td>
<td>.52 (.08–1.00)</td>
<td>.28 (.08–1.00)</td>
<td>.28 (.00–.38)</td>
<td>–</td>
<td>.78 (.00–.38)</td>
<td>.90 (.00–.39)</td>
<td>.27</td>
<td>44</td>
<td>56</td>
<td>5.93</td>
<td>.143</td>
</tr>
<tr>
<td>Affiliation &amp; emotional support</td>
<td>.29 (.00–.52)</td>
<td>.27 (.00–.51)</td>
<td>.37* (.01–1.00)</td>
<td>.43* (.01–1.00)</td>
<td>.88 (.00–.99)</td>
<td>–</td>
<td>.86 (.00–.99)</td>
<td>.86 (.00–.99)</td>
<td>.24</td>
<td>33</td>
<td>67</td>
<td>8.66*</td>
<td>.185</td>
</tr>
<tr>
<td>Affiliation &amp; self-disclosure</td>
<td>.28 (.00–.50)</td>
<td>.30 (.00–.52)</td>
<td>.38* (.02–1.00)</td>
<td>.45* (.02–1.00)</td>
<td>.88 (.00–.46)</td>
<td>–</td>
<td>.84 (.00–.46)</td>
<td>.84 (.00–.46)</td>
<td>.25</td>
<td>32</td>
<td>68</td>
<td>8.64*</td>
<td>.185</td>
</tr>
</tbody>
</table>

Note. $S_{FR}$ and $S_{ASP}$ = shared influences common to friendship and aspirations, $N_{FR}$, $N_{ASP}$ = nonshared influences common to friendship and aspirations. $s_{FR}$ = shared & $n_{FR}$ = nonshared influences unique to friendship; $s_{ASP}$ = shared & $n_{ASP}$ = nonshared = nonshared influence unique to aspirations. PC = Phenotypic correlation. Confidence intervals are depicted in brackets. * $p < .05$. 

substantially across schools (see review by Anderson, 1982) and have been found to affect students' motivation and goals (for a review see Urdan & Schoenfelder, 2006) and social competence (Brock, Nishida, Chiong, Grimm, & Rimm-Kaufman, 2008). Given the importance of school and classroom climate in a young person's life and the large amount of time adolescents spend in this setting, it is feasible that friendships, which are often cultivated in school, are affected by classroom or school atmosphere. By the same token, aspirations may also be shaped in part by the school/classroom environment (e.g., Blankenship, 1990 document associations between classroom climate and attitudes).

Limitations and future directions

Given the cross-sectional design of the current study, future longitudinal research is needed to identify the temporal order of the association between friendship experiences and aspirations. Such longitudinal studies should also consider the assessment of adolescent siblings’ close friends and their aspirations to examine friend selection and influence processes in a more sophisticated way. That is, at least two measurement points are needed to compare similarities between friends’ aspirations. Influence of friends, rather than “assortative selection” would then be explicit if the degree of similarity increases over time. Also, collecting data on parental aspirations as well as parent-child relationship quality would be beneficial in order to explore intra- and extra-familial influences simultaneously. Future studies could account for the possible mediating role of other specific factors such as adolescents’ personality traits or broader social contexts such as school or classroom climate. In addition, the current study relied exclusively on ordinary siblings; inferences about genetic and environmental effects are therefore not possible. Future studies into associations between aspirations or values and social relationships would benefit from a sample that includes siblings of different degrees of genetic relatedness. Such a study would enable the decomposition of shared and nonshared proportions of variance into their genetic and environmental parts. Finally, larger sample sizes than used here are desirable to conduct comparisons between different gender compositions. Although mean differences between male and female same-sex dyads were small, comparisons between opposite-sex and same-sex dyads could yield more complex findings.

Conclusion

The current study documents differential friendship experiences and aspirations as well as the association between these two, thereby contributing to knowledge about sources of adolescent siblings’ differences from outside the family. The results of the current study point to the impact of extra-familial experiences on sibling differences by showing that the association between friendships and aspirations was largely accounted for by nonshared factors. Siblings are not as similar in their aspirations for self-acceptance, affiliation, and financial success as socialization theory would imply, and our study verifies the assumption that nonshared, extra-familial networks are related to siblings’ differences in aspirations.

References


