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Revisiting the hypothesis that friends buffer against diminished self-esteem arising from poor quality parent-adolescent relationships: A replication study

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Abstract

This replication study revisited conclusions from two previous investigations (Gauze, Bukowski, Aquan-Assee, & Sippola, 1996; van Aken & Asendorpf, 1997), which suggested that support from friends buffers against diminished self-esteem arising from poor quality relationships with mothers during the transition into adolescence. The aim of this replication study was to conduct an independent test of these findings with both concurrent and longitudinal data. Concurrent data for replication analyses were drawn from 4 projects, involving a total of 959 boys and 1,119 girls (ages 10 to 14) from Canada and the USA. Three samples reported participant ethnic descent: Africa (12.1%), Asia (5.6%), Europe (65.3%), Latin America (12.1%), and Native North America (0.9%). Child and mother reports of mother-child relationship quality assayed (a) maternal social support (in 3 datasets), and (b) family cohesion and adaptability (in 2 datasets). Main effects were replicated but hypothesized buffering effects were not. Maternal social support and friend social support were independently associated with adolescent self-esteem, concurrently, but not longitudinally. Family cohesion (but not adaptability) was associated with adolescent self-esteem, concurrently and longitudinally. Friend social support did not moderate associations between mother-child relationship quality and adolescent self-esteem, concurrently or longitudinally. The findings are consistent with a cumulative effects model wherein friends uniquely contribute to adolescent self-worth, over and above the contribution of mothers. The findings do not support

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claims that friends moderate associations between mother-child relationship quality and adolescent self-esteem.

Keywords

Friendship; Parent-child relationship; self-esteem; adolescent development; replication study

Friends are widely assumed to be a developmental asset, particularly during the transition into adolescence, a time when relations with peers assume heightened significance. High quality friendships contribute to individual social and emotional well-being, including self-worth and self-esteem, likely because such relationships satisfy social needs for companionship and intimacy, and foster feelings of acceptance (Hartup, 1993). Friendships may also buffer against the untoward consequences of adverse environmental experiences. Considerable evidence, for example, supports the assertion that supportive friends attenuate the association between peer adversity (e.g., rejection and victimization) and negative outcomes (see Bagwell & Bukowski, 2018, for review). In this vein, support from friends is also posited to protect youth against adverse outcomes arising from difficulties with parents, although speculation has far outpaced research on this topic. The present replication study revisits a specific form of this hypothesis: *Support from friends buffers against diminished self-esteem arising from poor quality relationships with parents*. Two previous studies of young adolescents (Gauze, Bukowski, Aquan-Assee, & Sippola, 1996; van Aken & Asendorpf, 1997) advanced versions of this hypothesis, adopting different operational definitions of parent-child relationship quality derived from different assessment tools. Our replication study considered both, testing whether an individual's perception of friend support moderated (a) (originally reported) concurrent associations between perceived mother-adolescent relationship quality and adolescent self-esteem, and (b) longitudinal associations that reflect changes in self-esteem over time.

Conceptual Models Describing the Role of Friendship in Adolescent Self-Esteem

Friends hold the potential to bolster or undermine views of the self. They also hold the promise of protection, buffering against the consequences of debilitating experiences that might damage self-worth. Friendships occupy a position of considerable importance during the early years of adolescence. Engagement with family members declines as youth spend increasing amounts of time in the company of agemates. Friends play a crucial role navigating a rapidly expanding social world, protecting against loneliness, proffering emotional support and instrumental assistance, and bolstering well-being and belongingness (Bagwell & Schmidt, 2013). Many young adolescents report feeling closer to friends than to parents, and the proportion who report such sentiments grows across the middle school years (Laursen & Williams, 1997). Friends are increasingly relevant to the emerging self-worth of adolescents, with supportive friends lifting one's self-confidence and unsupportive friends undermining it.

Several conceptual frameworks outline the putative contributions of supportive friends to adolescent self-worth. Many models start from Sullivan's (1953) interpersonal theory, which holds that as their importance grows during the transition into adolescence, friends are in a position to compensate against threats to self-esteem arising from other (especially family) relationships. New forms of closeness and intimacy emerge with friends. As interconnections deepen, the provisions of friendships overlap with those proffered by parents (Furman, 1989), making it easier for friend support to be substituted for parent support. Indeed, it has been suggested that friends assume some of the attachment safe haven and proximity seeking functions that poor-quality parent-adolescent relationships lack (Markiewicz, Lawford, Doyle, & Haggart, 2006; Rubin, Dwyer, et al., 2004). Convoy models (Levitt, Guacci-Franco, & Levitt, 1993) take arguments about expanding social opportunities in a different direction, assuming that the number of relationships from which support is derived and the total amount of support received may be more important than the specific source of support. Thus, friends may not be unique in their ability to buffer against problems with parents, but friends gain salience during the transition into adolescence as they move into the inner circle of support providers. Finally, from a social skills perspective, close friendships provide important new opportunities for young adolescents to hone interpersonal competence; successful social exchanges deepen interconnections, enhance support received, and bolster confidence in one's ability to successfully navigate close peer relationships (Laursen & Bukowski, 1997). Children who fail to acquire these skills at home may profit most from the tutelage of close friends.

The direct and moderated models depicted in Figure 1 illustrate hypothesized mechanisms whereby friends and parents shape young adolescent self-esteem. The *cumulative effects model* (A) describes separate, unique main effects that make independent contributions to an outcome. The cumulative effects model is built on the assumption that self-esteem is a product of support from multiple relationships. Children with no supportive relationships should have the lowest self-esteem, followed by those with one supportive relationship (with either a parent or a friend); children who report high quality relationships with friends and parents should report the highest self-esteem. Two models describe contingent effects that reflect moderation. The *threshold or compensation model* (B) assumes that positive self-worth is contingent on support from either friends or parents. In threshold models, support from friends buffers against low self-esteem arising from poor relationships with parents. Thus, children with no supportive relationships have the lowest self-esteem and those with support from either parents or friends should report similarly high self-esteem. Only one supportive relationship is required; corresponding increases in self-esteem do not accompany additional supportive relationships. Not all moderation models reflect buffering, however. The *conjunction model* (C) assumes that positive self-worth is contingent on support from both friends and parents. In the conjunction model, friend support moderates the association between parent-child relationship quality and adolescent self-esteem, but it does not buffer against the effects of poor relationships with parents. Thus, children with one supportive relationship and children who lack supportive relationships have similarly low levels of self-esteem; elevated self-esteem should be found only among children reporting high quality relationships with friends and parents. Seen differently, the conjunction model

illustrates interpersonal risk, given than a single unsupportive relationship is sufficient for diminished self-esteem.

The Original Studies

Two empirical papers served as the starting point for our replication study. In the first investigation (van Aken & Asendorpf, 1997), 139 German children in grade 6 (ages 11 and 12 years) completed surveys describing global self-esteem (Self-Perception Profile for Children, Harter, 1985) and perceptions of social support (comprising the average of standardized subscale scores describing instrumental help, intimacy, enhancement of self-worth, and reliability, drawn from the Network of Relationships Inventory; Furman & Buhrmester, 1985) in relationships with mothers and classmates. Children rated multiple classmates; friendships were not explicitly assessed, but the classmate with the highest perceived support score was included in the analyses, so it is reasonable to assume that most of these classmates were friends. Global self-esteem was positively correlated with perceived support from mothers and (most supportive) classmates. Children were classified into high or low classmate support groups and high or low maternal support groups. Results described a conjunction effect: Children with above average support from both mothers and (most supportive) classmates reported higher self-esteem than children with above average support from only one of these relationships. Further, there were no differences in self-esteem between children who reported above average support in one relationship and those who reported below average support in both.

In the second investigation (Gauze et al., 1996), 138 Canadian children in grades 4, 5, and 6 (M=10.9 years) completed surveys describing general self-esteem (Perceived Competence Scale for Children, Harter, 1982), perceptions of family adaptability and cohesion (FACES II, Olson, Portner, & Bell, 1982), and best friendship quality (comprising the average of standardized subscale scores describing companionship, help/support, security, and closeness, drawn from the Friendship Quality Scale; Bukowski, Hoza, & Boivin, 1994). Results described associations between family adaptability and adolescent self-esteem and between family cohesion and adolescent self-esteem, both of which were moderated by friendship quality. Follow-up analyses described threshold effects: Children with one or two supportive relationships reported higher self-esteem than children with no supportive relationships. The self-esteem of children who reported above average support in one relationship resembled that of children who reported above average support in both.

Thus, two papers with two different measures of mother-child relationship quality found that friend support moderated the association between mother support and young adolescent self-esteem. The type of moderation, however, differed. All associations were concurrent; the direction of effects (i.e., from mother-child relationship quality to adolescent self-esteem) was implied.

The Current Replication Study

Although deliberate replication attempts have expanded rapidly across many areas of psychology, developmental psychology has been slow to embrace the practice. The problem

is not unique to the field of peer relationships. A vanishingly small number of publications in *Child Development* and *Developmental Psychology* identify -- as their primary aim -- an explicit attempt to replicate a prior research finding with a different data set (Duncan, Engel, Claessens, & Dowsett, 2014). Because of the time, effort, and expense involved in collecting developmental data, most replication studies are unintentional (i.e., unplanned or *post-hoc*) replication attempts, with data derived from research projects designed for purposes other than the reproduction of previous findings. Under these circumstances, the original study and the replication study will inevitably have differences in the instruments, procedures, and participants. Our study is no exception. We identified four different data sets that share enough similarities with the original studies that they could be described as constructive or conceptual replications (Lykken, 1968). Compared with literal or exact replications, which adhere to the same procedures as the original study in the same sample populations, our conceptual replication includes studies that vary in nontrivial ways from the original. The differences concern not only the national origin of the participants, but also the assessment tools and the reporters. Both of the original studies included concurrent data; our methods replicate the original concurrent analyses and extend them to a longitudinal framework, in an effort to predict changes in self-esteem from mother-child and friend relationships. We report *p* values for the analyses, but place greater emphasis on effect size comparisons in the interpretation of results. Consistent with recommendations, we describe effect sizes and significance tests for the replication analyses in sufficient detail to permit comparisons with the original findings (Brandt et al., 2014).

Two sets of analyses were conducted in an attempt to replicate findings describing friend support as a buffer against the effects of poor-quality relationships with mothers. The first analyses used three different datasets to examine whether friend support moderates associations between maternal support and adolescent self-esteem. The second analyses use two different datasets to examine whether friend support moderates associations between family adaptability and adolescent self-esteem and between family cohesion and adolescent self-esteem. We note several differences between the replication data and the original data. In the first case, the original study (van Aken & Asendorpf, 1997) of German children described support from closest classmates rather than from friends (as was the case in the replication studies). In the second case, the original study (Gauze et al., 1996) of Canadian children included a range of participant ages, some younger than those in the replication studies; friend support was assessed with different instruments, and family relationships were described by different reporters. The original findings were based on concurrent data; the replication analyses involve concurrent and longitudinal data, the latter exploring changes in adolescent self-esteem.

We pooled the samples used in the replication study through a process known as *integrative data analysis* (Curran & Hussong, 2009). The procedure has several advantages over single-study replication, including replication of results across multiple studies, increased statistical power, enhanced sample heterogeneity, and the inclusion of diverse construct assessments. Nevertheless, because the replication studies are not exact replications of the original, care must be taken to ensure that the samples can legitimately be combined; there were differences between the studies in historical time, in the nationality and ethnicity of the participants, in the number of items included in a variable, and in the version of an

instrument administered (for ease of comparison, study characteristics are listed in Table 1). To address concerns about pooling samples, we compared patterns of correlations and conducted group contrasts to determine if patterns of association differed between datasets. We also report separate results for each study included in the pooled analyses.

Method

Sample 1

Participants.—Data were drawn from a population-based sample of 662 twin pairs from the greater Montreal (Canada) area, who were recruited at birth between November 1995 and July 1998 (see Boivin et al., 2019). The present study included data collected from 178 MZ twins and 267 DZ twins (389 girls, 411 boys) when participants were in Grade 8 (M=14.1 years old; SD=0.3).

The demographic characteristics of the twin families at birth were comparable to those of a sample of single births representative of urban centers in the province: 84% percent of the families were of European descent, 3% were of African descent, 2% were of Asian descent, and 2% were Native North Americans. The remaining families (9%) did not provide ethnicity information. Almost all (95%) of the participants lived with two biological parents; most (83%) of the parents were employed; and most (83% of mothers and 86% of fathers) had at least a high school education.

Procedure.—Written consent was obtained from parents and adolescents. Data collection took place in the participants' homes. Instruments were administered in paper-and-pencil format in either French or English, depending on the language spoken by the families. Bilingual judges verified the semantic similarity of the back-translated and original items. No longitudinal data were available during the early years of adolescence for the variables of interest in this study. The project was approved by the Institutional Review Board of the Ste. Justine Hospital Research Centre (Peer Abuse and Psychosocial Health, protocol number 3039).

An average of 9.1% of reports were missing (*Range*=0–19.5%). Little's MCAR test indicated that data were missing completely at random $\chi^2(8)=7.32$, $p=0.50$. Missing data were handled with an EM algorithm with 20 iterations.

Measures.—Adolescent perceptions of *social support* in relationships with mothers and best friends were assessed with 6 items from the nurturance, affection, and instrumental aid subscales from the Network of Relationships Inventory (Furman & Buhrmester, 1985). Items were rated on a scale ranging from 1 (*little or never*) to 5 (*most of the time*). Item scores were averaged and standardized within each relationship. Internal reliability was good (alpha=.79 for mothers and .89 for best friends). Adolescents completed the 5-item *global self-worth* subscale from the Self-Perception Profile for Adolescents (Harter, 1988). Items were rated on a scale ranging from 1 (*really true* for the negative alternative) to 4 (*really true* for the positive alternative). Item scores were averaged and standardized. Internal reliability was good (alpha=.78).

Sample 2

Participants.—Data were drawn from a multi-cohort longitudinal study of 1333 participants from the greater Washington DC (USA) area, who were recruited in 1999 and 2000 (see Oh et al., 2008). The present study included two subsamples with data on the variables of interest: (1) concurrent analyses involved 415 (198 boys, 217 girls) young adolescents who began the project in grade 6 (M=11.4 years old; SD=0.5), and (2) longitudinal analyses involved 165 (71 boys, 94 girls) young adolescents who began the project in grade 5 (M=10.3 years old; SD=0.5).

Approximately 15% of the participants were African American, 15% were Asian American, 60% were European American, and 10% were Hispanic American. At the outset, most (75%) participants lived with both biological parents. Hollingshead (1975) four factor socioeconomic index scores ranged from 9 to 66 (M = 54.48, SD = 9.75) out of a potential range of 8 to 66.

Procedure.—Written consent was obtained from parents and adolescents. Instruments were administered in paper-and-pencil format during laboratory visits. Longitudinal data were collected approximately one year apart. The project was approved by the Institutional Review Board of the University of Maryland, College Park (protocol number 00475).

Of the 165 grade 5 participants, 51.5% (n=85) completed questionnaires in grade 6. For the concurrent analyses, an average of 11.7% of reports were missing (*Range*=0–23.4%). Little's MCAR test indicated that data were missing completely at random, $\chi^2(5)=3.06$, p=0.69. For the longitudinal analyses, an average of 9.7% of reports were missing (*Range*=0–47.9%). Little's MCAR test indicated that data were missing completely at random, $\chi^2(6)=3.64$, p=0.73. There were no statistically significant differences on any study variables between children who participated in both waves of data collection and those who only participated in one. Missing data were handled with an EM algorithm with 20 iterations.

Measures.—Adolescent perceptions of *social support* in relationships with mothers and reciprocated best friends were assessed with 24 items from the admiration, affection, companionship, instrumental aid, intimacy, nurturance, reliable alliance, and satisfaction subscales of the Network of Relationships Inventory (Furman & Buhrmester, 1985). Items were rated on a scale ranging from 1 (*little or none*) to 5 (*the most*). Item scores were averaged and standardized within each relationship. Internal reliability was good (alpha=.84 to .85 for mothers and .84 to .89 for best friends). Adolescents completed the 5-item *global self-worth* subscale from the Self-Perception Profile for Adolescents (Harter, 1988). Items were rated on a scale ranging from 1 (*really true* for the negative alternative) to 4 (*really true* for the positive alternative). Item scores were averaged and standardized. Internal reliability was good (alpha=.74 to .81).

Sample 3

Participants.—Data were drawn from a longitudinal study involving 313 adolescents (126 boys, 187 girls) and their mothers from the greater Miami (USA) area, who were recruited

in 1998 (see Laursen, DeLay, & Adams, 2010). The adolescent participants were in grade 6 (M=11.6 years old; SD=0.6) at the outset.

Approximately 26% of the sample was African American, 36% was European American, and 38% was Hispanic American. At the outset, 56.9% of participants lived with both biological parents. Hollingshead (1975) four factor socioeconomic index scores ranged from 11 to 66 (M = 38.54, SD = 9.91) out of a potential range of 8 to 66.

Procedure.—Written consent was obtained from parents and adolescents. Instruments were administered in paper-and-pencil format in quiet school settings. Longitudinal data were collected approximately one year apart. The project was approved by the Institutional Review Board of Florida Atlantic University (protocol number H98-33).

Of the 313 grade 6 participants, 77.4% (n=246) completed questionnaires in grade 7. An average of 10% of reports were missing from children (*Range*=3.5–22.6%) and 50.6% of reports were missing from mothers. Little's MCAR test indicated that data were missing completely at random for reports included in concurrent analyses, $\chi^2(6)=5.35$, $p=0.50$, and for reports included in longitudinal analyses, $\chi^2(27)=38.25$, $p=0.07$. There were no statistically significant differences on any study variables between children who participated in both waves of data collection and those who only participated in one. Missing data at the variable and wave levels were handled with an EM algorithm with 20 iterations.

Measures.—Adolescent perceptions of *social support* in relationships with mothers and reciprocated best friends were assessed with 24 items from the admiration, affection, companionship, instrumental aid, intimacy, nurturance, reliable alliance, and satisfaction subscales of the Network of Relationships Inventory (Furman & Buhrmester, 1985). Items were rated on a scale ranging from 1 (*little or none*) to 5 (*the most*). Item scores were averaged and standardized within each relationship. Internal reliability was good (alpha=.89 to .90 for mothers and .93 to .94 for best friends). Mother perceptions of family adaptability (15 items) and family cohesion (15 items) were assessed with the FACES II (Olson et al., 1982). Items were rated on a scale ranging from 1 (*almost never*) to 5 (*almost always*). Item scores were averaged and standardized. Internal reliability was good (alpha=.84 to .85). Adolescents completed the 5-item *global self-worth* subscale from the Self-Perception Profile for Adolescents (Harter, 1988). Items were rated on a scale ranging from 1 (*really true* for the negative alternative) to 4 (*really true* for the positive alternative). Item scores were averaged and standardized. Internal reliability was good (alpha=.68 to .74).

Sample 4

Participants.—Data were drawn from longitudinal study involving 232 adolescents (118 boys, 114 girls) and their mothers from the greater Montreal (Canada) area, who were recruited in 2006. The adolescent participants were in grade 6 (M=10.87 years old; SD=0.73) at the outset. All of the participants attended an English-speaking school. The investigator did not provide information on participant family structure, ethnicity or SES.

Procedure.—Written consent was obtained from parents and adolescents. Instruments were administered in paper-and-pencil format in the classroom during regular school hours.

Longitudinal data were collected approximately 4 months apart. The project was approved by the Human Research Ethics committee of Concordia University.

Of the 232 participants who completed questionnaires in January, 95.3% (n=221) also completed questionnaires in May. An average of 3.9% of reports were missing from children (Range=2.2–5.0%) and an average of 16.8% of reports were missing from mothers (Range=16.8–16.8%). Little's MCAR test indicated that data were missing completely at random for reports included in concurrent analyses, $\chi^2(16)=26.60$, $p=0.05$, and in longitudinal analyses, $\chi^2(18)=28.40$, $p=0.06$. There were no statistically significant differences on any study variables between children who participated in both waves of data collection and those who only participated in one. Missing data at the variable and wave levels were handled with an EM algorithm with 20 iterations.

Measures.—Adolescent perceptions of *social support* in relationships with friends were assessed with 24 items from the companionship, given affection, received affection, received nurturance, intimacy, satisfaction, security, and support subscales of the Network of Relationships Inventory (Furman & Buhrmester, 1985). Mother perceptions of family adaptability (7-items) and family cohesion (7-items) were assessed with the FACES IV (Olson, Gorall, & Tiesel, 2007). Items were rated on a scale ranging from 1 (*almost never*) to 5 (*almost always*). Item scores were averaged and standardized. Internal reliability was good (alpha=.73 to .76). Adolescents completed the 5-item *global self-worth* subscale from the Self-Perception Profile for Adolescents (Harter, 1988), separately rating positive stems and negative stems on a scale ranging from 1 (*not true*) to 4 (*really true*). Responses to positive stems and negative stems were separately averaged. The negative stem average was subtracted from the positive stem average; the result was standardized.

Plan of Analyses

Correlation contrasts, presented at the outset of the results, compare patterns of association between samples. The goal of these analyses was to alleviate concerns about the effects of sample heterogeneity and to support the decision to pool samples. Additional support for sample pooling comes from (a) tests for sample differences in the regression analyses and (b) replication analyses conducted separately by sample (described below).

A series of hierarchical multiple regression models was conducted in SPSS v25.0 (IBM Corp., 2019). Two sets of analyses were conducted to replicate the original results. First, samples 1, 2, and 3 were combined into a pooled sample in an attempt to replicate the finding (van Aken & Asendorpf, 1997) that friend support moderates the association between mother-child relationship quality (operationalized as maternal support) and adolescent self-esteem. The predictors included friend support, maternal support, and child gender. The main hypothesis was tested with an additional predictor variable: The interaction of maternal support X friend support. Concurrent adolescent self-esteem was the outcome variable. Second, samples 3 and 4 were combined into a pooled sample in an attempt to replicate the finding (Gauze et al., 1996) that friend support moderates the association between mother-child relationship quality (operationalized as family adaptability and family cohesion) and adolescent self-esteem. The predictors include friend support,

family cohesion, family adaptability, and child gender. The main hypothesis was tested with two additional predictor variables: The interaction of family adaptability X friend support and the interaction of family cohesion X friend support. Concurrent adolescent self-esteem was the outcome variable. In each case, preliminary analyses included sample and child age/grade as additional main effects and in two- and three- way interaction terms. There were neither main effects nor interactions involving sample and child age/grade, so these variables were dropped from the final set of analyses. Supplemental Figures S1–S6 depict follow-up plots for all interaction effects, regardless of their statistical significance, to assist in comparisons with the original findings.

Identical analyses were conducted separately for each sample (see Supplemental Tables S1–S9). Results from the primary regression analyses include the size of the effect (given as Cohen's f^2) for each predictor in the pooled sample. Tables 3, 4, 6, and 7 also include the range of effects for the analyses conducted separately for each sample.

The original moderated findings involved concurrent data. Supplemental analyses were conducted with longitudinal data to test the hypothesis that friend support moderates the association between mother-child relationship quality and changes in adolescent self-esteem. The analyses are identical to those described above for concurrent data except that Time 1 self-esteem was included as an additional predictor variable and Time 2 self-esteem was the outcome variable. Samples 2 and 3 were combined into a pooled sample to examine whether friend support moderates the association between mother-child relationship quality (operationalized as maternal support) and changes in child self-esteem. Samples 3 and 4 were combined into a pooled sample to examine whether friend support moderates the association between mother-child relationship quality (operationalized as family adaptability and family cohesion) and changes in child self-esteem.

A final set of supplemental analyses were conducted to mirror the analytic strategies described in the original reports. In the first case, ANOVAs with planned follow-up contrasts were employed to explore moderation in analyses using maternal support to index the quality of mother-child relationships. In the original study (van Aken & Asendorpf, 1997), analyses using NRI data to index the quality of friend and mother-child relationships were limited to separate t-tests of mother support (high vs. low) and friend support (high vs. low), followed by a series of planned comparisons involving 4 dichotomized groups purportedly testing moderated effects (high mother support and high friend support vs. low mother support and high friend support vs high mother support and low friend support vs. low mother support and low friend support). Using data from the replication study, we conducted ANOVAs (in lieu of t-tests, in order to statistically test interactions) and planned contrasts. We recognize that continuous variables ought not be dichotomized (MacCallum, Zhang, Preacher, & Rucker, 2002); we do so here only to facilitate the comparison of parallel results across studies. The planned comparison results were converted to Cohen's d and effect sizes were contrasted using confidence interval comparisons (Cumming & Finch, 2005). Effect sizes across studies were considered to be significantly different if the intervals overlapped less than half the margin of error. The original study lacked sufficient details for any other effect size contrasts with the main effects from the replication study. In the second case, hierarchical linear regressions were employed to explore moderation in analyses

using family adaptability and cohesion to index the quality of mother-child relationships. As in the original study (Gauze et al., 1996), analyses using FACES data to index the quality of mother-child relationships and NRI data to index the quality of friendships included comparisons of three main effects (i.e., family adaptability, family cohesion, and friend support) and two moderated effects (family adaptability X friend support and family cohesion X friend support). The *F*-values for each variable in the original study were converted to r^2; these r^2 values were then converted to Cohen's f^2 (Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012). The original study lacked sufficient detail on error terms to calculate confidence intervals, so comparisons across studies are limited to inspection of the f^2 values from the original study against the 95% confidence intervals obtained in the replication study.

Results

Preliminary Analyses

Correlation contrasts were conducted to identify between-sample heterogeneity in patterns of association between study variables. One sample difference emerged in the concurrent data and one sample difference emerged in the longitudinal data. In the concurrent data, the correlation between family cohesion and family adaptability was greater in Sample 3 (r = .65) than in Sample 4 (r = .47), z = 2.97, p = .003. In the longitudinal data, the correlation between Time 1 global self-worth and Time 2 global self-worth was greater in Sample 4 (r = .65) than in Sample 3 (r = .47), z = 3.02, p = .003.

Friend Social Support as a Moderator of the Association Between Maternal Social Support and Adolescent Self-Esteem

Concurrent analyses.—Table 2 presents correlations between variables. Mother and friend social support were positively correlated ($p < .05$), with each other and with global self-worth.

A hierarchical regression model was estimated to predict adolescent global self-worth from concurrent mother social support, friend social support, and child gender. Table 3 presents results pooled across 20 imputed datasets, conducted on a pooled sample (N=1528) derived from samples 1 (n=800), 2 (n=415), and 3 (n=313).

The first step of the regression model was statistically significant, $F_{mean}(3, 1524)=57.48$, $p<0.001$ (F_{range}=51.97–63.84, $p<0.001$), explaining 10.2% (*Range*=9.3–11.2%) of the variance in global self-worth. Statistically significant main effects emerged for mother social support, friend social support, and child gender. Higher levels of support from mothers and friends were associated with greater concurrent adolescent self-esteem. Boys reported higher self-esteem than girls. The second and third steps of the regression model each explained an additional 0.2% (*Range*=0.1–0.2%) of the variance in global self-worth. There were no statistically significant two- or three-way interactions. Supplemental Figure S1 depicts follow-up plots for the nonsignificant interaction between mother support and friend support. The results are consistent with a cumulative effects model; there is no suggestion of the conjunction effect reported in the original study.

The analyses were repeated separately for samples 1, 2, and 3 (see Supplemental Tables S1–S3). Statistically significant main effects emerged for mother social support in all three samples (f^2 *Range*=0.03–0.10). Friend social support was statistically significant in sample 2 only (f^2=0.02; (f^2 for samples 1 and 3 *Range*=0.004–0.011). Child gender was statistically significant in sample 1 only (f^2=0.03; f^2 samples 2 and 3 *Range*=0.001–0.019). There were no statistically significant 2-way interactions in any sample (f^2 *Range*=0.000–0.007). The 3-way interaction (mother social support X friend social support X child gender) was statistically significant in sample 3 only (f^2=0.01; samples 1 and 2 *Range*=0.001–0.005).

Finally, to approximate the analyses conducted in the original study, we performed a 2 (friend social support: below/above the median) × 2 (mother social support: below/above the median) ANOVA. Concurrent global self-worth was the dependent variable. Although one would typically not perform follow-up planned comparisons in the absence of statistically significant ANOVA results, we nevertheless contrasted (a) the high friend/high mother support group with the low friend/high mother support group, and (b) the high friend/high mother support group with the high friend/low mother support group. Separate ANOVAs were conducted for each of the 20 imputed concurrent datasets. Statistically significant main effects emerged for mother social support, $F_{mean}(1, 1466)=63.83$, $p<0.001$ (F_{range}=55.29–76.34, $p<0.001$) and friend social support, $F_{mean}(1, 1466)=7.11$, $p=0.01$ (F_{range}=4.17–11.05, p=0.001–0.041). The interaction between mother and friend social support was not statistically significant, $F_{mean}(1, 1466)=0.49$, $p=0.83$ (F_{range}=0.00–2.01, p=0.16–0.95). Replicating results from the original study, planned follow-up contrasts revealed differences on concurrent global self-worth (a) between the high friend/high mother support group and the low friend/high mother support group, pooled $t(2070)=2.31$, $p=0.02$, $d=0.19$ (d 95% CI =0.03–0.34), and (b) between the high friend/high mother support group and the high friend/low mother support group, pooled $t(1196)=5.55$, $p<0.001$, $d=0.49$ (d CI 95%=0.33–0.65). The respective effect sizes for the original study were $d=0.35$ (95%=0.00–0.73) and $d=0.78$ (95% CI=0.38–1.17). Effect size contrasts (Cumming & Finch, 2005) based on confidence intervals obtained in the original study and in the replication study failed to reveal statistically significant differences in either set of comparisons.

Longitudinal analyses.—Table 2 presents correlations between variables. There were positive correlations ($p<.05$) between Time 1 mother social support, friend social support, and global self-worth. Mother and friend social support at Time 1 were positively correlated with global self-worth at Time 2. The global self-worth autocorrelation was statistically significant.

A hierarchical regression model was estimated to predict adolescent global self-worth at Time 2 from Time 1 adolescent global self-worth, mother social support, friend social support, and child gender. Table 4 presents results pooled from 20 imputed datasets, conducted on a pooled sample (N=478) derived from samples 2 (n=165) and 3 (n=313).

The first step of the regression model was statistically significant, $F_{mean}(4, 473)=35.28$, $p<0.001$ (F_{range}=27.87–42.78, $p<0.001$), explaining 22.9% (Range=19.1–26.6%) of the variance in Time 2 global self-worth. A statistically significant main effect emerged for Time 1 global self-worth. There were no statistically significant main effects for mother

social support, friend social support, or child gender. The second and third steps of the regression model explained, respectively, an additional 0.3% (*Range*=0.2–0.3%) and 0.1% (*Range*=0.1–0.1%), of the variance in Time 2 global self-worth. There were no statistically significant two- or three-way interactions. Supplemental Figure S2 depicts follow-up plots for the nonsignificant interaction between mother support and friend support.

The analyses were repeated separately for samples 2 and 3 (see Supplemental Tables S4 and S5). In both samples there were statistically significant main effects for T1 global self-worth (f^2 *Range*=0.17–0.39). In both samples there were no statistically significant main effects for Time 1 mother social support (f^2 *Range*=0.01–0.01), Time 1 friend social support (f^2 *Range*=0.000–0.001), or child gender (f^2 *Range*=0.001–0.006). There were no statistically significant 2-way interactions (f^2 *Range*=0.00–0.01) or 3-way interactions (f^2 *Range*=0.00–0.01).

Friend Social Support as a Moderator of Associations between Family Adaptability/Family Cohesion and Adolescent Self-Esteem

Concurrent analyses.—Table 5 presents correlations between variables. Family cohesion and family adaptability were positively correlated (p<.05), but neither was associated with friend social support or global self-worth. Friend social support was positively correlated with global self-worth.

A hierarchical regression model was estimated to predict adolescent global self-worth from concurrent family adaptability, family cohesion, friend social support, and child gender. Table 6 presents results pooled across 20 imputed datasets, conducted on a pooled sample (N=550) derived from samples 3 (n=318) and 4 (n=232).

The first step of the regression model was statistically significant, $F_{mean}(5, 542)=5.98$, p<0.001 (F_{range}=4.02–10.24, p=0.003 to p=0.011), explaining 4.0% (Range=2.9–7.0%) of the variance in global self-worth. Statistically significant main effects emerged for friend social support and family cohesion. Higher levels of support from friends and higher levels of family cohesion were associated with greater concurrent adolescent global self-worth. There were no statistically significant main effects for family adaptability or child gender. The second and third steps of the regression model explained, respectively, an additional 1.0% (*Range*=0.6–1.3%) and 0.1% (*Range*=0.0–0.1%), of the variance in adolescent global self-worth. There were no statistically significant two- or three-way interactions. Supplemental Figures S3 and S4 depict follow-up plots for the nonsignificant interaction between family cohesion and friend support and between family adaptability and friend support. The results for family cohesion are consistent with a cumulative effects model. The results for family adaptability reflect a main effect for friend support (only). In neither case was there any suggestion of the threshold effect reported in the original study.

The analyses were repeated separately for samples 3 and 4 (see Supplemental Tables S6 and S7). Statistically significant main effects emerged for friend support in both samples (f^2 *Range*=0.02–0.04). There were no statistically significant main effects in either sample for family cohesion (f^2 *Range*=0.01–0.02), family adaptability (f^2 *Range*=0.003–0.011), or child

gender (f^2 *Range*=0.00–0.01). Neither were there statistically significant 2-way interactions (f^2 *Range*=0.00–0.01) or 3-way interactions (f^2 *Range*=0.000–0.005).

Finally, to compare the effect sizes reported above with those from the original study, we converted *F*-values to r^2 for each variable in the regression equation in the original study; these r^2 values were then converted to Cohen's f^2 (Selya et al., 2012). The original study lacked sufficient detail on error terms to calculate confidence intervals, so comparisons across studies are limited to inspection of results. In terms of main effects, f^2 results from the replication study resembled those obtained in the original study, with f^2 values in the original study falling within or near the 95% CI of f^2 values in the replication study (family adaptability: replication=0.01 [95% CI=0.00, 0.04], original=0.03; family cohesion: replication=0.005 [95% CI=0.00, 0.01], original<0.001; friend social support: replication=0.03 [95% CI=0.01, 0.06], original=0.08. There was greater divergence in results for two-way interactions: family adaptability X friend social support (replication<0.0002 [95% CI=0.0000, 0.0004], original=0.06) and family cohesion X friend social support (replication<0.00003 [95% CI=0.00000, 0.00006], original=0.07). The original study did not report the details on higher order interactions other than to state that they were not statistically significant, so we could not compare the magnitude of the effects for three-way interactions.

Longitudinal analyses.—There was a positive correlation (p<.05) between Time 1 family cohesion and Time 1 family adaptability. Time 1 friend social support was positively correlated with global self-worth at Time 1 and Time 2. Time 1 family cohesion was positively correlated with global self-worth at Time 2. The global self-worth autocorrelation was statistically significant.

A hierarchical regression model was estimated to predict adolescent global self-worth at Time 2 from Time 1 adolescent global self-worth, family adaptability, family cohesion, friend social support, and child gender. Table 7 presents results pooled across 20 imputed datasets, conducted on a pooled sample (N=550) derived from samples 3 (n=318) and 4 (n=232).

The first step of the regression model was statistically significant, $F_{mean}(5, 541)=50.77$, p<0.001 (F_{range}=45.48–56.65, p<0.001), explaining 31.9% (Range=29.6–34.4%) of the variance in Time 2 global self-worth. Statistically significant main effects emerged for Time 1 global self-worth and Time 1 family cohesion. Higher levels of Time 1 family cohesion were associated with greater increases in adolescent global self-worth. There were no statistically significant main effects for family adaptability, friend social support, or child gender. The second and third steps of the regression model explained, respectively, an additional 1.2% (*Range*=0.6–1.2%) and 0.1% (*Range*=0.0–0.1%), of the variance in Time 2 global self-worth. There were no statistically significant two- or three-way interactions. Supplemental Figure S5 depicts follow-up plots for the nonsignificant interaction between family cohesion and friend social support; reasonable people might argue as to whether the null interaction finding hints at a conjunction effect. Supplemental Figure S6 depicts follow-up plots for the nonsignificant interaction between family adaptability and friend social support.

The analyses were repeated separately for samples 3 and 4 (see Supplemental Tables S8 and S9). Statistically significant main effects emerged for Time 1 global self-worth in both samples (f^2 *Range*=0.25–0.67). There was a statistically significant main effect for Time 1 family cohesion in sample 4 (f^2=0.04) but not in sample 3 (f^2=0.02). There were no statistically significant main effects in either sample for Time 1 family adaptability (f^2 *Range*=0.00–0.02), Time 1 friend support (f^2 *Range*=0.00–0.01), or child gender (f^2 *Range*=0.003–0.003). Neither were there statistically significant 2-way interactions (f^2 *Range*=0.00–0.02) or 3-way interactions (f^2 *Range*=0.00–0.01).

Discussion

Data from multiple studies, analyzed collectively and separately, were unable to replicate previous findings suggesting that friend social support moderates associations between mother-child relationship quality and concurrent adolescent self-esteem. Not only did the hypothesized moderated associations fail to reach conventional levels of statistical significance, but the magnitude of the effects obtained in the replications were considerably smaller than in the originals. Put simply, we could not substantiate claims that positive relationships with friends buffer against diminished self-esteem arising from poor relationships with parents.

We did find that friend support and mother support were concurrently associated with self-esteem, as reported in the original studies. These main effects are consistent with a cumulative effects model, in which each relationship makes a unique, independent contribution to adolescent well-being. Findings from concurrent data come with an important caveat: Longitudinal analyses failed to indicate that initial support from either mothers or friends was related to subsequent changes in self-esteem. Only family cohesion was associated with adolescent self-esteem concurrently and longitudinally. The null findings from longitudinal data raise the prospect that third variables may be responsible for concurrent associations between relationship quality and self-esteem or that self-esteem may shape subsequent perceptions of relationship quality. Further speculation on this point is premature.

The hypothesized interaction between mother and friend support failed to materialize, both concurrently and longitudinally. A reasonable next question is whether the hypothesized findings might emerge among older adolescents, who are relatively closer to and more intimate with their friends than are younger adolescents (Bokhorst, Sumter, & Westenberg, 2010). Two studies of youth in middle school and high school included ancillary analyses of concurrent data that bear on our replication effort. A study of U.S. high school students, completing the same instruments as those employed in the original German study, found that maternal (but not friend) support was associated with concurrent global self-worth (Laursen, Furman, & Mooney, 2006). Neither predicted change in global self-worth over time and there was no evidence that friend social support moderated the association between mother social support and adolescent global self-worth, concurrently or longitudinally. A similar study of U.S. middle school and high school students revealed cumulative effects; students with high levels of social support from parents and friends reported greater concurrent self-esteem than those with high levels of support from only parents or friends who, in

turn, reported greater concurrent self-esteem than those with high levels of support from neither (Rosenfeld, Richman, & Bowen, 2000). Thus, the findings from older adolescents are consistent with those that emerged from younger adolescents, leaving the door open to the prospect of concurrent cumulative effects, but discounting the likelihood of moderated associations. The findings all point to the same conclusion: It would be prudent for scholars to refrain from claims that friends protect adolescents against diminished self-esteem arising from poor quality relationships with parents.

We encourage others to evaluate claims that friends buffer against other adverse outcomes linked to difficulties with parents. Some outcomes might be more susceptible to close friend influence than self-esteem. For example, high quality relationships with friends have been reported to attenuate links between negative parenting behaviors and longitudinal increases in adolescent externalizing symptoms (e.g., Lansford, Criss, Pettit, Dodge, & Bates, 2003) and between poor quality relationships with parents and concurrent adolescent internalizing symptoms (e.g., Laible, Carlo, & Raffaelli, 2000). The significance of close friends to the development and maintenance of adolescent internalizing and externalizing problems is clear (Deater-Deckard, 2001), and findings from the present study neither contradict nor cast doubt on these results. But renewed attention should be given to presumptive moderated associations others have noted the relative paucity of findings in which friend support moderates associations between parent-child relationships and adolescent maladjustment (Bagwell & Bukowski, 2018). Finally, little is known about the contributions of fathers, specifically whether their contributions are interchangeable with those of mothers or supplement them, and whether friend support mitigates the adverse consequences of poor-quality father-child relationships.

We hesitate to engage in post-hoc speculation about why the original findings could not be replicated. Failure to replicate is not uncommon. A large proportion of replication attempts fail (Open Science Collaboration, 2015), which has prompted a crisis of confidence among some empirical psychologists. Here we consider three commonly cited possibilities, two that focus on the original research and one on the replication. The most straightforward explanation is that false positives happen, particularly in concurrent correlational studies that are unable to assess change in the dependent variable and that may not be able to adequately control for the contribution of important confounds. Consumers of the literature bear some responsibility. The two original studies – both commonly cited as evidence for buffering– implied different forms of moderation. In other words, one did not replicate the other. With the benefit of hindsight, this would seem to be an unheeded red flag. A different explanation focuses on the changing nature of scientific psychology. The original studies were published almost 25 years ago, well before the current emphasis on reproducibility in psychology. Publication standards and research practices were different, as was awareness about threats to research fidelity and concern about replication (Simmons, Nelson, & Simonsohn, 2011).

It is also worth considering the caliber of the replication effort. By adopting integrative analytic practices, we took advantage of the strengths afforded from pooling data across studies (Hofer & Piccinin, 2009). In so doing, we were able to overcome two of the most commonly invoked reasons for replication failure, namely inadequate sample size and the use of single studies (Maxwell, Lau, & Howard, 2015). The analyses of concurrent data

involved participants from two or three different studies, each of which had between two to six times the number of participants as the original; the pooled sample analyses had between three to eleven times the number of participants as the original. None found evidence of moderation, despite the dramatic increase in power. It is not unusual for replication attempts to yield similar effects of a smaller magnitude (Open Science Collaboration, 2015). That was not the case here. Confidence intervals for effect size estimates did not overlap and inspection of follow-up plots did not reveal interaction trends that looked remotely like the original moderated findings.

Sample heterogeneity is a strength but also a potential liability of integrative data analyses. Pooling data across studies increases the generalizability of the results by extending findings to a diverse population. The advantage is best realized when accompanied by evidence that the variables behave similarly in different contexts. Although we did not go so far as to apply IRT-inspired controls to adjust for sample variations (Curran & Hussong, 2009), it is unlikely that controls of this sort would alter findings such that nonsignificant interaction terms of trivial effect size would grow in magnitude to become statistically significant. Confidence in this conclusion is bolstered by the consecutive replications imbedded in our findings, where the same pattern of statistically significant results emerged for each sample separately. Note also that correlation contrasts revealed few differences between samples in patterns of association, more evidence for the claim that sample heterogeneity was not the reason why the replication attempt failed. Finally, we standardized variables within samples because the instruments and items differed somewhat. As a consequence, we could not test for mean level differences across samples, another potential source of heterogeneity. Had they existed, it would not change the fact that correlations between variables were similar, in almost every instance, across the different samples.

Still, the replication attempts were inexact and we must consider subtle differences in methods. In the first instance, the original study (van Aken & Asendorpf, 1997) assayed social support from the most supportive classmate, who may or may not have been a friend. In the replication studies, participants rated social support in highest ranked (typically reciprocated) friends. We think it unlikely that differences in the source of peer support were responsible for differences in the results, because friends should be more (not less) apt than classmates to mitigate the effects of poor relationships with mothers. Finally, and perhaps most obviously, the original study included German children born in the early 1980s, whereas the replication studies included North American children born a generation or so later. Numerous cultural differences have been identified in the qualities and impact of parent and peer relationships (Rubin, Oh, Menzer, & Ellison, 2011), and electronic devices have dramatically changed the nature of friendships in the last decade (Underwood, Brown, & Ehrenreich, 2018), factors that may well contribute to differences between the original results and those from our replication. In the second instance (Gauze et al., 1996), the original study assayed friend social support using the Friendship Quality Scale (Bukowski et al., 1994), whereas the replication study utilized the Network of Relationships Inventory (Furman & Buhrmester, 1985). Although the measures bear a strong resemblance to one another, with similar forms of converging validity (Furman, 1996), we know of no studies that report correlations across measures of friend support. There were also differences in participant ages: The original study included children from Montreal (Canada) in grades

4, 5, and 6; the replication study included children from Miami (USA) and Montreal (Canada) in grade 6 only. We think it unlikely that age differences were responsible for differences in the results, because friends should become increasingly effective buffers against poor quality parent-adolescent relationships across the transition into middle school, as the significance of peer relationships grows (Kingery, Erdley, & Marshall, 2011). Finally, the replication studies relied on mother-reports of family adaptability and cohesion whereas the original study used child-report. We cannot rule out the possibility of differences arising from shared-reporter variance, but it seems unlikely that these would be found only in interaction terms and not main effects. None of the procedural differences described above were foreseen as candidates to explain the failure to replicate; any attempt to invoke them now would be an exercise in post-hoc reasoning.

Confidence in the findings is bolstered by the fact that most of the main effect findings from the original studies were reproduced in both replication attempts. Friend and mother social support were concurrently correlated with global self-worth. As was the case in the original study, family adaptability was not correlated with global self-worth; unexpectedly, family cohesion was statistically significant in the replication attempt but not in the original. The replication attempts had far more power than the original analyses, so the presence of main effects but the absence of interactions cannot be attributed to underpowered tests.

It is increasingly clear that friends do mitigate adverse *peer* experiences. Strong evidence suggests that friend characteristics buffer longitudinally against the consequences of victimization (e.g., Brendgen et al., 2013; Thompson & Leadbeater, 2013). Further, both short- (e.g., Bukowski, Laursen, & Hoza, 2010; Laursen, Bukowski, Aunola, & Nurmi, 2007) and long-term (e.g., Marion, Laursen, Zettergren, & Bergman, 2013) longitudinal studies indicate that the presence of friends buffers against problems arising from low peer status.

To conclude: Until new findings emerge to suggest otherwise, strong claims should not be made about the ability of friends to buffer against the consequences of difficult relationships with parents on child self-esteem. In the same breath, however, we want to emphasize findings that were replicated: Support from mothers and support from friends were each uniquely associated with concurrent global self-worth, leading us to conclude that a cumulative effects model is a more accurate description of the contributions that these relationships make to adolescent self-worth. This conclusion comes with an important caveat: We (and others) failed to find similar associations longitudinally, implying the need to temper conclusions about the direction of effects.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

Bagwell CL, & Bukowski WM (2018). Friendship in childhood and adolescence: Features, effects, and processes. In Bukowski WM, Laursen B, & Rubin KH (Eds.), Handbook of peer interactions, relationships, and groups (pp. 371–390). Guilford.

Bagwell CL, & Schmidt ME (2013). Friendships in childhood and adolescence. Guilford.

Boivin M, Brendgen M, Dionne G, Ouellet-Morin I, Dubois L, Pérusse D, Robaey P, Tremblay RE& Vitaro F (2019). The Quebec Newborn Twin Study at 21. Twin Research and Human Genetics, 22, 475–481. 10.1017/thg.2019.74 [PubMed: 31630700]

Bokhorst CL, Sumter SR, & Westenberg PM (2010). Social support from parents, friends, classmates, and teachers in children and adolescents aged 9 to 18 years: Who is perceived as most supportive? Social Development, 19, 417–426. 10.1111/j.1467-9507.2009.00540.x

Brandt MJ, IJzerman H, Dijksterhuis A, Farach FJ, Geller J, Giner-Sorolla R, Grange JA, Perugini M, Spies JR, & van't Veer A (2014). The Replication Recipe: What makes for a convincing replication? Journal of Experimental Social Psychology, 50, 217–224. 10.1016/j.jesp.2013.10.005

Brendgen M, Vitaro F, Barker ED, Girard A, Dionne G, Tremblay RE, & Boivin M (2013). Do other people's plights matter? A genetically informed twin study of the role of social context in the link between peer victimization and children's aggression and depression symptoms. Developmental Psychology, 49, 327–340. 10.1037/a0025665 [PubMed: 21967566]

Bukowski WM, Hoza B, & Boivin M (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the Friendship Qualities Scale. Journal of Social and Personal Relationships, 11, 471–484. 10.1177/0265407594113011

Bukowski WM, Laursen B, & Hoza B (2010). The snowball effect: Friendship moderates escalations in depressed affect among avoidant and excluded children. Development and Psychopathology, 22, 749–757. 10.1017/S095457941000043X [PubMed: 20883579]

Cumming G, & Finch S (2005). Inference by eye: Confidence intervals and how to read pictures of data. American Psychologist, 60, 170–180. 10.1037/0003-066X.60.2.170

Curran PJ, & Hussong AM (2009). Integrative data analysis: The simultaneous analysis of multiple data sets. Psychological Methods, 14, 81–100. [PubMed: 19485623]

Deater-Deckard K (2001). Annotation: Recent research examining the role of peer relationships in the development of psychopathology. Journal of Child Psychology and Psychiatry, 42, 565–579. 10.1111/1469-7610.00753 [PubMed: 11464962]

Duncan GJ, Engel M, Claessens A, & Dowsett CJ (2014). Replication and robustness in developmental research. Developmental Psychology, 50, 2417–2425. 10.1037/a0037996 [PubMed: 25243330]

Furman W (1989). The development of children's social networks. In Belle D (Ed.) Children's social networks and social supports (pp. 136–151). Wiley.

Furman W (1996). The measurement of friendship perceptions: Conceptual and methodological issues. In Bukowski WM, Newcomb AF, & Hartup WW (Eds.), The company they keep: Friendship in childhood and adolescence (pp. 41–65). Cambridge University Press.

Furman W, & Buhrmester D (1985). Children's perception of the personal relationships in their social networks. Developmental Psychology, 21, 1016–1024. 10.1037/0012-1649.21.6.1016

Gauze C, Bukowski WM, Aquan-Assee J, & Sippola LK (1996). Interactions between family environment and friendship and associations with self-perceived well-being during adolescence. Child Development, 67, 2201–2216. 10.2307/1131618 [PubMed: 9022238]

Harter S (1982). The Perceived Competence Scale for Children. Child Development, 53, 87–97. 10.2307/1129772

Harter S (1985). Manual for the Self-Perception Profile for Children. University of Denver.

Harter S (1988). Manual for the Self-Perception Profile for Adolescents. University of Denver.

Hollingshead AA (1975). Four-factor index of social status. Yale University.

Hartup WW (1993). Adolescents and their friends. In Laursen B (Ed.), New Directions for Child and Adolescent Development, No. 60. Close friendships in adolescence (pp. 3–22). Jossey-Bass. 10.1002/cd.23219936003

Hofer SM, & Piccinin AM (2009). Integrative data analysis through coordination of measurement and analysis protocol across independent longitudinal studies. Psychological Methods, 14, 150–164. 10.1037/a0015566 [PubMed: 19485626]

IBM Corp. (Released 2016). IBM SPSS Statistics for Windows (Version 25.0). IBM Corp.

Kingery JN, Erdley CA, & Marshall KC (2011). Peer acceptance and friendship as predictors of early adolescents' adjustment across the middle school transition. Merrill-Palmer Quarterly, 57, 215–243. 10.1353/mpq.2011.0012

Laible DJ, Carlo G, & Raffaelli M (2000). The differential relations of parent and peer attachment to adolescent adjustment. Journal of Youth and Adolescence, 29, 45–59. 10.1023/A:1005169004882

Lansford JE, Criss MM, Pettit GS, Dodge KA, & Bates JE (2003). Friendship quality, peer group affiliation, and peer antisocial behavior as moderators of the link between negative parenting and adolescent externalizing behavior. Journal of Research on Adolescence, 13, 161–184. 10.1111/1532-7795.1302002 [PubMed: 20209019]

Laursen B, & Bukowski WM (1997). A developmental guide to the organisation of close relationships. International Journal of Behavioral Development, 21, 747–770. 10.1080/016502597384659 [PubMed: 20090927]

Laursen B, Bukowski WM, Aunola K, & Nurmi J-E (2007). Friendship moderates prospective associations between social isolation and adjustment problems in young children. Child Development, 78, 1395–1404. 10.1111/j.1467-8624.2007.01072.x [PubMed: 17650145]

Laursen B, DeLay D, & Adams RE (2010). Trajectories of perceived support in mother–adolescent relationships: The poor (quality) get poorer. Developmental Psychology, 46), 1792–1798. 10.1037/a0020679 [PubMed: 21058837]

Laursen B, Furman W, & Mooney KS (2006). Predicting interpersonal competence and self-worth from adolescent relationships and relationship networks: Variable-centered and person-centered perspectives. Merrill-Palmer Quarterly, 52, 572–600. 10.1353/mpq.2006.0030

Laursen B, & Williams VA (1997). Perceptions of interdependence and closeness in family and peer relationships among adolescents with and without romantic partners. In Shulman S & Collins WA (Eds.), New directions for child development, No. 78. Romantic relationships in adolescence: Developmental perspectives (pp. 3–20). Jossey-Bass. 10.1002/cd.23219977803

Levitt MJ, Guacci-Franco N, & Levitt JL (1993). Convoys of social support in childhood and early adolescence: Structure and function. Developmental Psychology, 29, 811–818. 10.1037/0012-1649.29.5.811

Lykken DT (1968). Statistical significance in psychological research. Psychological Bulletin, 70, 151–159. [PubMed: 5681305]

MacCallum RC, Zhang S, Preacher KJ, & Rucker DD (2002). On the practice of dichotomization of quantitative variables. Psychological Methods, 7, 19–41. 10.1037/1082-989X.7.1.19 [PubMed: 11928888]

Marion D, Laursen B, Zettergren P, & Bergman LR (2013). Predicting life satisfaction during middle adulthood from peer relationships during mid-adolescence. Journal of Youth and Adolescence, 42, 1299–1307. 10.1007/s10964-013-9969-6 [PubMed: 23771820]

Markiewicz D, Lawford H, Doyle AB, & Haggart N (2006). Developmental differences in adolescents' and young adults' use of mothers, fathers, best friends, and romantic partners to fulfill attachment needs. Journal of Youth and Adolescence, 35, 127–140. 10.1007/s10964-005-9014-5

Maxwell SE, Lau MY, & Howard GS (2015). Is psychology suffering from a replication crisis? What does "failure to replicate" really mean? American Psychologist, 70, 487–498. 10.1037/a0039400

Oh W, Rubin KH, Bowker JC, Booth-LaForce C, Rose-Krasnor L, & Laursen B (2008). Trajectories of social withdrawal from middle childhood to early adolescence. Journal of Abnormal Child Psychology, 36, 553–566. 10.1007/s10802-007-9199-z [PubMed: 18193479]

Olson DH, Gorall DM, Tiesel JW (2007). FACES IV manual. Life Innovations.

Olson DH, Portner J, & Bell R (1982). Family adaptability and cohesion scales (FACES II). University of Minnesota.

Open Science Collaboration (2015). Estimating the reproducibility of psychological science. Science. 349, 943–950. 10.1126/science.aac4716

Rosenfeld LB, Richman JM, & Bowen GL (2000). Social support networks and school outcomes: The centrality of the teacher. Child and Adolescent Social Work Journal, 17, 205–226. 10.1023/A:1007535930286

Rubin KH, Dwyer KM, Booth-LaForce C, Kim AH, Burgess KB, & Rose-Krasnor L (2004). Attachment, friendship, and psychosocial functioning in early adolescence. Journal of Early Adolescence, 24, 326–356. 10.1177/0272431604268530

Rubin KH, Oh W, Menzer M, & Ellison K (2011). Dyadic relationships from a cross-cultural perspective: Parent-child relationships and friendship. In Chen X & Rubin KH (Eds.), Social, emotional, and personality development in context. Socioemotional development in cultural context (pp. 208–236). Guilford.

Selya AS, Rose JS, Dierker LC, Hedeker D, & Mermelstein RJ (2012). A practical guide to calculating Cohen's f^2, a measure of local effect size, from PROC MIXED. Frontiers in Psychology, 3, 111. 10.3389/fpsyg.2012.00111 [PubMed: 22529829]

Simmons JP, Nelson LD, & Simonsohn U (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. Psychological Science, 22, 1359–1366. 10.1177/0956797611417632 [PubMed: 22006061]

Sullivan HS (1953). The interpersonal theory of psychiatry. Norton.

Thompson RSY, & Leadbeater BJ (2013). Peer victimization and internalizing symptoms from adolescence into young adulthood: Building strength through emotional support. Journal of Research on Adolescence, 23, 290–303. 10.1111/j.1532-7795.2012.00827.x [PubMed: 27307688]

Underwood MK, Brown BB, & Ehrenreich SE (2018). Social media and peer relations. In Bukowski WM, Laursen B, & Rubin KH (Eds.), Handbook of peer interactions, relationships, and groups (pp. 533–551). Guilford.

van Aken MAG, & Asendorpf JB (1997). Support by parents, classmates, friends and siblings in preadolescence: Covariation and compensation across relationships. Journal of Social and Personal Relationships, 14, 79–93. 10.1177/0265407597141004

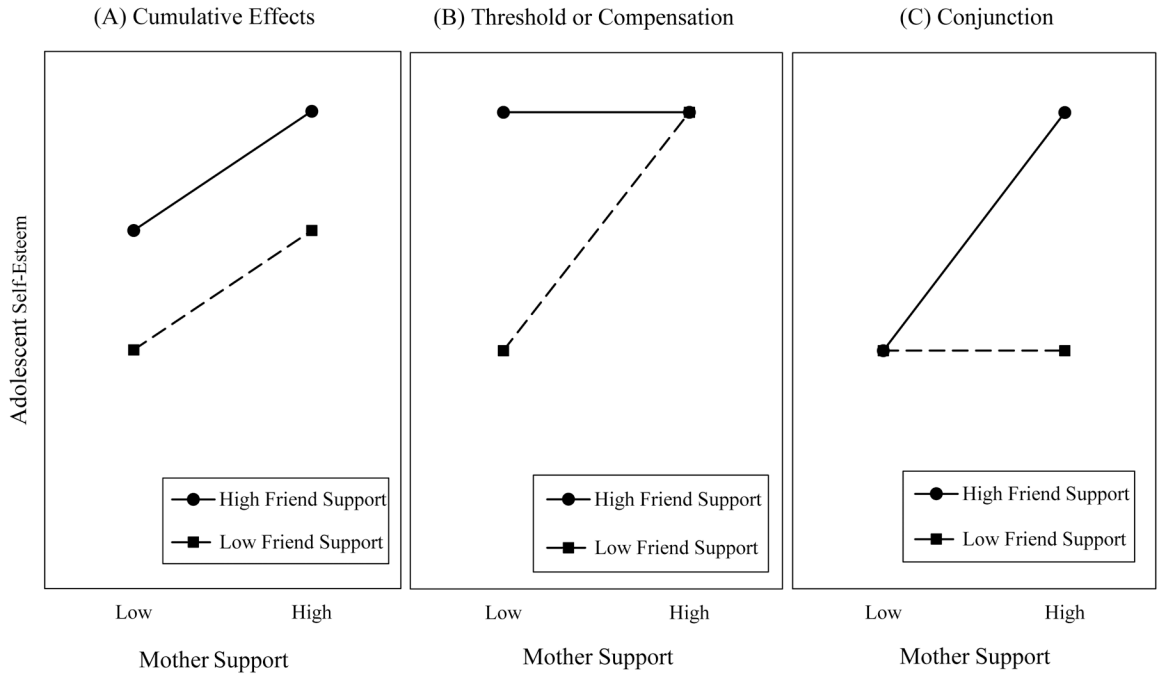

Figure 1.

Conceptual Models Describing Friend Support and Mother Support as Independent Predictors of Adolescent Self-Esteem (A) and Friend Support as a Moderator of Associations between Mother Support and Adolescent Self-Esteem (B and C).

Table 1.

Study Characteristics

	Sample 1	Sample 2	Sample 3	Sample 4
Child Characteristics (Concurrent/Longitudinal)	*N*=662 (50% girls)	*N*=415/165 (52%/57% girls)	*N*=313 (60% girls)	*N*=232 (49% girls)
	Age=14.1 years	Age=11.4 years/10.3 years at outset	Age=11.6 years at outset	Age=10.9 years at outset
	Background: European descent (84%); 2-parent family (95%); Montreal, Canada	Background: European descent (60%); 2-parent family (75%); Washington DC, USA	Background: European descent (36%); 2-parent family (57%); Miami, USA	Background: Ethnicity and family composition unavailable; Montreal, Canada
Assessments	Concurrent only: Between 2009 and 2012	Concurrent: 1999 and 2000	Concurrent: 1998	Concurrent: January 2006
		Longitudinal: 1999 and 2000	Longitudinal: 1998 and 1999	Longitudinal: January and May 2006
	Location: Home	Location: Laboratory	Location: School (adolescents) and home (mothers)	Location: School (adolescents) and home (mothers)
	Language: French or English	Language: English	Language: English	Language: English
Variables				
Social Support	Child report about mother and friend NRI, 6 items	Child report about mother and friend NRI, 24 items	Child report about mother and friend NRI, 24 items	Child report about friend only NRI, 24 items
Adaptation			Mother report FACES II, 15 items	Mother report FACES IV, 7 items
Cohesion			Mother report FACES II, 15 items	Mother report FACES-IV, 7 items
Global Self-worth	Child report SPPA, 5 items	Child report SPPA, 5 items	Child report SPPA, 5 items	Child report SPPA, positive stem (5 items) minus negative stem (5 items)

Notes. FACES: Family Adaptability and Cohesion Evaluation Scale (version II: Olson, Portner, & Bell, 1982; version IV: Olson, Gorall, &Tiesel, 2007). NRI: Network of Relationships Inventory (Furman & Buhrmester, 1985). SPPA: Self-Perception Profile for Adolescents (Harter, 1988).

Table 2.

Interclass Correlations for Samples Included in Analyses Predicting Global Self-Worth from Friend Social Support and Mother Social Support

	1 [95% CI]	2 [95% CI]	3 [95% CI]	4 [95% CI]
1. Mother Social Support - Time 1	-	.40** [.32, .48]	.23** [.14, .32]	19** [.08, .29]
2. Friend Social Support - Time 1	.38** [.33, .44]	-	.22** [.13, .30]	.13** [.03, .23]
3. Global Self-Worth - Time 1	.28** [.23, .34]	.16** [.11, .21]	-	.47** [.37, .57]
4. Global Self-Worth - Time 2	-	-	-	-

Note: N = 1528 for concurrent analyses (below the diagonal) and 478 for longitudinal analyses (above the diagonal). K = 3 samples (samples 1, 2, and 3) for concurrent analyses and 2 samples (samples 2 and 3) for longitudinal analyses.

** $p < .01$ (two-tailed).

Table 3.

Results from Multiple Hierarchical Regression Analyses Predicting Global Self-worth from Concurrent Friend Social Support and Mother Social Support.

Predictors	Step 1			Step 2			Step 3		
	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)
Main Effects									
Intercept	−0.01 (0.03) [−0.06, 0.04]	0.70	--	−0.02 (0.03) [−0.08, 0.04]	0.50	--	−0.02 (0.03) [−0.08, 0.04]	0.45	--
Mother Social Support	0.26 (0.03) [0.20, 0.32]	<0.01	0.06 (0.03–0.10)	0.26 (0.03) [0.20, 0.32]	<0.01	0.06 (0.03–0.10)	0.27 (0.03) [0.20, 0.33]	<0.01	0.06 (0.03–0.08)
Friend Social Support	0.11 (0.03) [0.05, 0.17]	<0.01	0.01 (0.01–0.02)	0.11 (0.03) [0.05, 0.17]	<0.01	0.01 (0.00–0.02)	0.11 (0.03) [0.05, 0.17]	<0.01	0.01 (0.00–0.02)
Child Gender	−0.14 (0.03) [−0.19, −0.09]	<0.01	0.02 (0.00–0.03)	−0.14 (0.03) [−0.19, −0.09]	<0.01	0.02 (0.00–0.03)	−0.13 (0.03) [−0.19, −0.07]	<0.01	0.02 (0.00–0.03)
Two-way Interactions									
Mother Social Support X Friend Social Support				0.00 (0.03) [−0.05, 0.05]	0.92	<0.01 (0.00–0.01)	0.01 (0.03) [−0.05, 0.06]	0.83	<0.01 (0.00–0.01)
Mother Social Support X Child Gender				0.01 (0.03) [−0.05, 0.07]	0.73	<0.01 (0.00–0.01)	0.00 (0.03) [−0.06, 0.06]	0.90	<0.01 (0.00–0.00)
Friend Social Support X Child Gender				0.03 (0.03) [−0.04, 0.09]	0.42	<0.01 (0.00–0.00)	0.03 (0.03) [−0.04, 0.09]	0.41	<0.01 (0.00–0.00)
Three-way Interactions									
Mother Social Support X Friend Social Support X Child Gender							−0.03 (0.03) [−0.08, 0.03]	0.34	<0.01 (0.00–0.01)
Model R^2		<0.01	0.10		<0.01	0.10		<0.01	0.10

Note: N = 1528. *K* = 3 (samples 1, 2, and 3). Standardized regression coefficients are reported. Child gender: 1 = male, 2 = female. *Range* = minimum and maximum of Cohen's f^2 in analyses conducted separately for each sample.

Table 4.

Results from Multiple Hierarchical Regression Analyses Predicting Changes in Global Self-worth from Antecedent Friend Social Support and Mother Social Support

Predictors	Step 1			Step 2			Step 3		
	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)
Main Effects									
Intercept	−0.08 (0.05) [−0.17, 0.02]	0.12	--	−0.07 (0.05) [−0.17, 0.03]	0.19	--	−0.07 (0.05) [−0.17, 0.03]	0.18	--
Global Self-Worth T1	0.43 (0.05) [0.33, 0.52]	<0.01	0.23 (0.17–0.39)	0.43 (0.05) [0.33, 0.52]	<0.01	0.23 (0.18–0.38)	0.43 (0.05) [0.33, 0.52]	<0.01	0.23 (0.17–0.39)
Mother Social Support T1	0.09 (0.05) [−0.01, 0.20]	0.09	0.01 (0.01–0.01)	0.09 (0.06) [−0.04, 0.22]	0.16	0.01 (0.01–0.01)	0.10 (0.07) [−0.04, 0.23]	0.15	0.01 (0.01–0.01)
Friend Social Support T1	0.01 (0.05) [−0.09, 0.11]	0.91	<0.01 (0.00–0.00)	0.00 (0.05) [−0.10, 0.10]	0.94	<0.01 (0.00–0.00)	0.00 (0.05) [−0.10, 0.10]	0.94	<0.01 (0.00–0.00)
Child Gender	−0.06 (0.05) [−0.15, 0.03]	0.20	0.01 (0.00–0.01)	−0.06 (0.05) [−0.15, 0.03]	0.18	0.01 (0.00–0.01)	−0.05 (0.05) [−0.15, 0.04]	0.27	<0.01 (0.00–0.00)
Two-way Interactions									
Mother Social Support X Friend Social Support				0.00 (0.04) [−0.07, 0.08]	0.95	<0.01 (0.00–0.00)	0.01 (0.04) [−0.07, 0.08]	0.84	<0.01 (0.00–0.01)
Mother Social Support X Child Gender				−0.01 (0.05) [−0.10, 0.09]	0.92	<0.01 (0.00–0.01)	−0.02 (0.06) [−0.13, 0.09]	0.73	<0.01 (0.00–0.00)
Friend Social Support X Child Gender				−0.04 (0.05) [−0.13, 0.05]	0.40	<0.01 (0.00–0.01)	−0.04 (0.05) [−0.14, 0.05]	0.39	<0.01 (0.00–0.02)
Three-way Interactions									
Mother Social Support X Friend Social Support X Child Gender							−0.02 (0.04) [−0.09, 0.06]	0.65	<0.01 (0.00–0.01)
Model R^2		<0.01	0.23		<0.01	0.23		<0.01	0.23

Note: N = 478. *K* = 2 (samples 2 and 3). Standardized regression coefficients are reported. Child gender: 1 = male, 2 = female. *Range* = minimum and maximum of Cohen's f^2 in analyses conducted separately for each sample.

Table 5.

Interclass Correlations for Samples Included in Analyses Predicting Global Self-Worth from Friend Social Support and Family Adaptability/Cohesion.

	1 [95% CI]	2 [95% CI]	3 [95% CI]	4 [95% CI]	5 [95% CI]
1. Family Cohesion - Time 1	-	.57** [.48, .67]	−.03 [−.14, .08]	.09 [−.02, .21]	.15** [.05, .26]
2. Family Adaptability - Time 1	.57** [.48, .67]	-	.08 [−.04, .19]	.01 [−.10, .11]	−.01 [−.13, .11]
3. Friend Social Support - Time 1	−.03 [−.14, .08]	.08 [−.04, .19]	-	.15** [.06, .24]	.10* [.02, .19]
4. Global Self-Worth - Time 1	.09 [−.02, .21]	.01 [−.10, .11]	.15** [.06, .24]	-	.54** [.46, .62]
5. Global Self-Worth - Time 2	-	-	-	-	-

Note: N = 550 for concurrent analyses (below the diagonal) and longitudinal analyses (above the diagonal). K = 2 samples (samples 3 and 4) for concurrent and longitudinal analyses.

* $p < .05$,

** $p < .01$ (two-tailed).

Table 6.

Results from Multiple Hierarchical Regression Analyses Predicting Global Self-worth from Concurrent Friend Social Support, Family Cohesion, and Family Adaptability.

Predictors	Step 1			Step 2			Step 3		
	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)
Main Effects									
Intercept	−0.01 (0.04) [−0.09, 0.08]	0.91	--	−0.01 (0.05) [−0.11, 0.09]	0.83	--	−0.01 (0.05) [−0.11, 0.09]	0.82	--
Family Cohesion	0.15 (0.07) [0.01, 0.29]	0.04	0.01 (0.01–0.01)	0.15 (0.07) [0.01, 0.30]	0.04	0.01 (0.01–0.01)	0.16 (0.08) [0.01, 0.31]	0.04	0.01 (0.01–0.02)
Family Adaptability	−0.09 (0.06) [−0.22, 0.04]	0.16	0.01 (0.00–0.01)	−0.08 (0.06) [−0.21, 0.04]	0.20	0.01 (0.00–0.01)	−0.09 (0.07) [−0.23, 0.05]	0.20	0.01 (0.00–0.01)
Friend Social Support	0.18 (0.05) [0.08, 0.27]	<0.01	0.03 (0.02–0.04)	0.17 (0.05) [0.08, 0.27]	<0.01	0.03 (0.02–0.04)	0.17 (0.05) [0.08, 0.27]	<0.01	0.03 (0.02–0.04)
Child Gender	−0.06 (0.05) [−0.14, 0.03]	0.20	<0.01 (0.00–0.01)	−0.06 (0.05) [−0.15, 0.03]	0.21	<0.01 (0.00–0.01)	−0.06 (0.05) [−0.15, 0.03]	0.20	<0.01 (0.00–0.01)
Two-way Interactions									
Family Cohesion X Friend Social Support				−0.01 (0.07) [−0.15, 0.13]	0.91	<0.01 (0.00–0.00)	−0.01 (0.07) [−0.15, 0.13]	0.91	<0.01 (0.00–0.00)
Family Adaptability X Friend Social Support				−0.02 (0.07) [−0.16, 0.12]	0.76	<0.01 (0.00–0.00)	−0.02 (0.07) [−0.16, 0.12]	0.77	<0.01 (0.00–0.00)
Family Cohesion X Family Adaptability				0.00 (0.05) [−0.10, 0.10]	0.99	<0.01 (0.00–0.00)	0.00 (0.05) [−0.10, 0.10]	1.00	<0.01 (0.00–0.00)
Family Cohesion X Child Gender				−0.05 (0.06) [−0.17, 0.07]	0.39	<0.01 (0.00–0.01)	−0.05 (0.06) [−0.17, 0.07]	0.38	<0.01 (0.00–0.01)
Family Adaptability X Child Gender				0.01 (0.07) [−0.12, 0.13]	0.94	<0.01 (0.00–0.00)	0.00 (0.07) [−0.13, 0.13]	0.95	<0.01 (0.00–0.00)
Friend Social Support X Child Gender				0.04 (0.05) [−0.06, 0.13]	0.43	<0.01 (0.00–0.01)	0.04 (0.05) [−0.05, 0.13]	0.42	<0.01 (0.00–0.01)
Three-way Interactions									
Family Cohesion X Friend Social Support X Child Gender							−0.02 (0.07) [−0.15, 0.11]	0.73	<0.01 (0.00–0.00)
Family Adaptability X Friend Social Support X Child Gender							0.01 (0.07) [−0.13, 0.15]	0.85	<0.01 (0.00–0.00)
Model R^2		<0.01	0.04		<0.01	0.04		<0.01	0.04

Note: $N = 550$. $K = 2$ (samples 3 and 4). Standardized regression coefficients are reported. Child gender: 1 = male, 2 = female. *Range* = minimum and maximum of Cohen's f^2 in analyses conducted separately for each sample.

Table 7.

Results from Multiple Hierarchical Regression Analyses Predicting Changes in Global Self-worth from Antecedent Friend Social Support, Family Cohesion, and Family Adaptability.

Predictors	Step 1			Step 2			Step 3		
	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)	β (*SE*) [95% CI]	*p*	Cohen's f^2 (range)
Main Effects									
Intercept	−0.01 (0.04) [−0.09, 0.06]	0.77	--	−0.02 (0.05) [−0.11, 0.08]	0.76	--	−0.01 (0.05) [−0.11, 0.08]	0.76	--
Global Self-Worth T1	0.52 (0.04) [0.44, 0.59]	<0.01	0.38 (0.25–0.67)	0.52 (0.04) [0.44, 0.60]	<0.01	0.38 (0.25–0.67)	0.52 (0.04) [0.44, 0.60]	<0.01	0.38 (0.25–0.67)
Family Cohesion T1	0.17 (0.05) [0.07, 0.28]	<0.01	0.03 (0.02–0.04)	0.19 (0.06) [0.08, 0.30]	<0.01	0.03 (0.02–0.04)	0.19 (0.06) [0.07, 0.31]	<0.01	0.03 (0.02–0.04)
Family Adaptability T1	−0.12 (0.06) [−0.24, 0.01]	0.06	0.01 (0.00–0.02)	−0.11 (0.06) [−0.23, 0.01]	0.08	0.01 (0.00–0.02)	−0.11 (0.06) [−0.23, 0.02]	0.11	0.01 (0.00–0.02)
Friend Social Support T1	0.06 (0.04) [−0.03, 0.14]	0.18	<0.01 (0.00–0.01)	0.05 (0.04) [−0.03, 0.13]	0.24	<0.01 (0.00–0.01)	0.05 (0.04) [−0.03, 0.13]	0.24	<0.01 (0.00–0.01)
Child Gender	−0.05 (0.04) [−0.13, 0.03]	0.19	<0.01 (0.00–0.00)	−0.06 (0.04) [−0.14, 0.02]	0.14	<0.01 (0.00–0.00)	−0.06 (0.04) [−0.14, 0.02]	0.16	<0.01 (0.00–0.00)
Two-way Interactions									
Family Cohesion X Friend Social Support				0.04 (0.06) [−0.08, 0.16]	0.49	<0.01 (0.00–0.02)	0.04 (0.06) [−0.08, 0.17]	0.49	<0.01 (0.00–0.02)
Family Adaptability X Friend Social Support				−0.02 (0.06) [−0.14, 0.10]	0.75	<0.01 (0.00–0.02)	−0.02 (0.06) [−0.14, 0.10]	0.75	<0.01 (0.00–0.02)
Family Cohesion X Family Adaptability				0.04 (0.04) [−0.05, 0.12]	0.39	<0.01 (0.00–0.02)	0.04 (0.04) [−0.05, 0.12]	0.39	<0.01 (0.00–0.02)
Family Cohesion X Child Gender				−0.03 (0.06) [−0.15, 0.08]	0.58	<0.01 (0.00–0.00)	−0.03 (0.06) [−0.15, 0.08]	0.58	<0.01 (0.00–0.00)
Family Adaptability X Child Gender				−0.02 (0.06) [−0.14, 0.10]	0.76	<0.01 (0.00–0.00)	−0.02 (0.06) [−0.14, 0.10]	0.75	<0.01 (0.00–0.00)
Friend Social Support X Child Gender				−0.05 (0.04) [−0.14, 0.03]	0.21	<0.01 (0.00–0.01)	−0.05 (0.04) [−0.14, 0.03]	0.20	<0.01 (0.00–0.01)
Three-way Interactions									
Family Cohesion X Friend Social Support X Child Gender							0.01 (0.06) [−0.10, 0.12]	0.89	<0.01 (0.00–0.00)
Family Adaptability X Friend							−0.02 (0.06) [−0.13, 0.10]	0.80	<0.01 (0.00–0.01)

Predictors	Step 1			Step 2			Step 3		
	β (*SE*) [95% CI]	***p***	**Cohen's f^2 (range)**	**β (*SE*) [95% CI]**	***p***	**Cohen's f^2 (range)**	**β (*SE*) [95% CI]**	***p***	**Cohen's f^2 (range)**
Social Support X Child Gender									
Model R^2		<0.01	0.32		<0.01	0.33		<0.01	0.33

Note: $N = 550$. $K = 2$ (samples 3 and 4). Standardized regression coefficients are reported. Child gender: 1 = male, 2 = female. *Range* = minimum and maximum of Cohen's f^2 in analyses conducted separately for each sample.