

## 4. RESULTS

The results are presented in the same sequence as the hypotheses were posed. Accordingly, this chapter is divided into two main sections. Results about the effects of sociometric status on the structural relations and mean levels of agency and means-ends beliefs, and their functioning in the domain of friendship during middle childhood are described first. The section describing the exploratory analyses addressing the question whether friendless children differ in the ascribed importance of friendships from friended children follows. The two main sections are preceded by a part reporting preparatory analyses. The first part of the preparatory analyses provides a summary of the results of cross-sectional analyses of the structural relations and mean levels of agency and means-ends beliefs, and the development of their functioning in the domain of friendship across grades 3 to 6. The assessment of higher-order structures of agency and means-ends beliefs, and action strategies was part of these grade-level comparisons. The analyses reported in the main sections were based on the established higher-order representations of these constructs because higher-order structures are a more parsimonious representation of constructs (i.e., smaller number of constructs). Moreover, the preparatory analyses addressed the internal validity, measurement equivalence (i.e., metric invariance), and homogeneity of variances of the constructs across sociometric groups of friended and friendless children. Finally, covariate effects (i.e., gender, linear, and quadratic effects of grade) were investigated across these groups of children in the preparatory section.

### 4.1 Preparatory Analyses

#### 4.1.1 Summary of Cross-sectional Age Comparisons: Development of Agency and Means-ends, Goal Difficulty, Action Strategies, and Friendship Outcomes (i.e., Self- and Friend-rated Friendship Quality and Number of Mutual Friendships)

This section provides an overview of the results of the conducted grade-level comparisons which were conducted as preparatory analyses. These summarized analyses are detailed and discussed in Appendix G. First, the results of the assessment of higher-order structures of agency and means-ends beliefs, and action strategies across grade levels are summarized. The analyses reported in the main sections were based on the established higher-order representations of these constructs. A summary of the main findings of the

developmental analyses reported in Appendix G follows. The findings show that children increasingly differentiated between beliefs about external means (e.g., Luck and Adults) and beliefs about self-related means. In contrast, they showed only a low degree of differentiation between agency and means-ends beliefs in the domain of friendship across the investigated age range. However, in support of the theoretical distinction there was also empirical evidence for differentiation between belief types, in part, even beginning from grade 3.

#### 4.1.1.1 Higher-order Structures of Agency and Means-ends beliefs across Grade Levels

The preparatory analyses provided evidence that agency and means-ends beliefs, and action strategies can be invariantly represented by higher-order structures across grade levels. Beliefs for the means Effort, Ability, and Personal Attributes could be represented as a higher-order construct, termed Self, in both the agency and means-ends belief systems. Beliefs about the means Parents and Teachers as Powerful Others could be represented as a higher-order construct, termed Adults as Powerful Others for both the agency and means-ends beliefs across grade levels. Moreover, the action strategies Doing Nothing and Avoidance could be represented as a higher-order construct, termed Action Omission. As a consequence, in subsequent analyses the established higher-order constructs were represented by domain-representative parcels (Kishton & Widaman, 1994).

#### 4.1.1.2 Low Degree of Differentiation between Agency and Means-ends beliefs and Increases in Differentiation between External and Self-related Causes across Grade Levels

The action-theory of psychological control posits that the relationships of agency and means-ends beliefs, action strategies, and friendship outcomes are affected by children's development. Therefore, as preparatory analyses, I cross-sectionally examined the development of perceived control about friendship across grades 3 to 6. During middle childhood children's understanding that powerful others and luck are potentially uncontrollable represents a major development (Flammer, 1990; Skinner, 1991, 1995; Skinner et al., 1998; Weisz, 1983). This developmental change in children's understanding of these action means is reflected in children's means-ends beliefs. Empirical findings show that in the friendship domain children's means-ends beliefs about Powerful Others (i.e., Parents) and Luck show decreases in mean levels and are less highly correlated with self-related (i.e., Effort and Personal Attributes) belief dimensions at the end of the investigated age range

(grades 3 - 6) (Skinner 1990b). The preparatory analyses explored whether these differences in the mean-levels and intercorrelations found in the means-ends beliefs (e.g., Skinner, 1990b) are also found in the agency belief system. The assumption, that agency and means-ends beliefs may show similar developmental differences was based on previous findings indicating that both types of beliefs are highly correlated; children of grades 3 - 5 differentiate only to a low degree among agency and means-ends beliefs (Wanner, 1995). Alternatively, it could be that the lack of developmental differences in the agency beliefs found in the academic domain generalizes into the friendship domain. However, based on assumptions of the action theory of control (e.g., Skinner, 1995), I hypothesized that with age and accumulating failure experiences children increasingly differentiate among agency and means-ends beliefs (i.e., the correlations of agency and means-ends beliefs decrease).

The action theory of psychological control posits that the developmental increases in differentiation between (a) agency and means-ends beliefs and (b) beliefs about external and self-related causes are related to their functioning. In line with theoretical assumptions of locus of control (Rotter, 1966), children's increases in understanding that the external means Luck and Help provided by Powerful Others are less controllable than self-related means such as Effort, high means-ends beliefs about external means indicate low feelings of control. Thus, at older ages external means-ends beliefs were hypothesized to be negatively related to effort investments (i.e., Direct Action) and friendship outcomes. Moreover, at older ages external means-ends beliefs were hypothesized to be positively related to Action Omission and Seeking Help. In contrast, at earlier ages external means-ends beliefs were hypothesized to evince similar relationships with Direct Action and friendship outcomes as external agency beliefs. All dimensions of agency beliefs and self-related means-ends beliefs were hypothesized to be positively related to Direct Action and friendship outcomes, although agency beliefs about external means may evince lower relationships than beliefs about self-related means. In contrast, agency beliefs are hypothesized to be negatively related to Action Omission and Seeking Help. Moreover, I hypothesized that with increasing age the relationships among agency beliefs (and self-related means-ends beliefs), action strategies, and friendship outcomes may increase because with age and accumulating experiences, children's perceived control about friendship may become more realistic.

Furthermore, as preparatory analyses, I examined whether both agency and means-ends beliefs can be invariantly represented by higher-order structures across the investigated age range. Specifically, I assume that beliefs about the means Effort, Ability, and Personal Attributes can be invariantly represented as higher-order constructs (i.e., agency and means-ends beliefs about Self) across the investigated grade levels. Moreover, I assume that beliefs about Parents and Teachers as Powerful Others can be invariantly represented as a higher-order construct (i.e., agency and means-ends beliefs about Adults as Powerful Others).

Finally, I hypothesize that at all ages high Goal Difficulty indicates a feeling of lack of control. Generally, global perceptions of control develop at earlier ages than both agency and means-ends beliefs (for a review, see Skinner, 1995). Thus, across all age groups the relationships of Goal Difficulty, action strategies, and friendship outcomes should be reversed when compared to agency beliefs.

The results of the age-group comparisons provided support for Skinner's (e.g., 1995) proposition that in middle childhood the major development in perceived control involves the differentiation among specific means dimensions. Increases in children's understanding that Luck and adults' help are uncontrollable causes while self-related means are more controllable were indicated by (a) the expected declines in mean levels of beliefs about Luck and Adults, (b) the unexpected increase in beliefs about Self, and (c) the expected drop in correlations of beliefs about Luck and the remaining belief dimensions, although, beliefs about Adults, unexpectedly, were not involved in these developmental differences. The onset of the decline in mean levels of beliefs about external means (i.e., Luck and Adults) was found already in grade 5; that is, mean-level decline was found one grade level earlier than found in a previous study (Skinner, 1990). However, most of the differences in the correlational patterns evinced only in grade 6.

Consistent, with previous findings in the friendship domain (Wanner, 1995) agency and means-ends beliefs were highly correlated indicating that the children differentiated only to a low degree between these two belief types. Importantly, in support of the theoretical distinction with age the degree of differentiation between belief types increased as indicated by a drop in correlations of beliefs about Self and Luck across belief types. However, the low degree of differentiation between belief types was indicated by (a) the similarities in both the

patterns of and the age-related differences in the mean levels and the correlations within belief system, (b) the similarities in both the patterns of and the age-related differences in the relationships of agency and means-ends beliefs with action strategies, and (c) the similarity in both the patterns of and the age-related differences in the relationships of agency and means-ends beliefs with Goal Difficulty.

Table 5  
*Latent Correlations of Agency and Means-ends Beliefs and Action Strategies Across Grade Levels*

Action Strategy	Dimension	Grades 3 - 5		Grade 6	
		$\underline{r}$	$\underline{z}$	$\underline{r}$	$\underline{z}$
<i>Agency Beliefs and Action Strategies</i>					
Direct Action	Self	.70	24.27		
	Luck	.32	6.38	.12	1.26
	Adult	.37	7.27 <sup>b</sup>		
Seeking Help	Self	.37	7.74		
	Luck	.29	5.82		
	Adult	.44	9.91		
Action Omission	Self	.15	3.14	-.15	-1.58
	Luck	.29	5.82	.22	4.90
	Adult	.22	2.75 <sup>b</sup>	.02 <sup>a</sup>	0.08
<i>Means-ends Beliefs and Action Strategies</i>					
Direct Action	Self	.69	22.73		
	Luck	.33	6.36	.11	1.20
	Adult	.35	6.84 <sup>b</sup>		
Seeking Help	Self	.34	6.93		
	Luck	.30	5.85		
	Adult	.45	9.91		
Action Omission	Self	.17	3.35	-.14	-1.54
	Luck	.29	5.82	.23	5.05
	Adult	.27	3.25 <sup>b</sup>	.01 <sup>a</sup>	0.06

Note.  $\underline{r}$  = latent correlation;  $\underline{z}$  =  $\underline{z}$  of the correlation; <sup>a</sup> = the correlation was invariantly found across grade 5 and grade 6; <sup>b</sup> = for grade 4 the estimate was significantly different compared to the depicted estimate of grade 3 (and the remaining grade levels).

As seen in Table 5, the low degree of differentiation between belief types, in part, was also reflected in the correlations of the beliefs and action strategies. More specifically, both agency and means-ends beliefs about Self were positively correlated with Direct Action. As expected, agency beliefs about external means evinced lower correlations with Direct Action compared to agency beliefs about Self. However, the results provided no evidence for the hypothesized negative relationships of external means-ends beliefs and Direct Action at older ages. Instead, they remained, as their counterparts in the agency beliefs did, lowly and

positively correlated with Direct Action. However, in grade 6 both agency and means-ends beliefs about Luck were uncorrelated with Direct Action.

In contrast, both agency and means-ends beliefs about Luck were positively correlated with Action Omission across all age groups. Beliefs about Luck were the single belief dimension which were positively correlated with Action Omission in grade 6. Both agency and means-ends beliefs about Adults were positively correlated with Action Omission across grades 3 and 4. In contrast, across grades 5 and 6 these beliefs about Adults were uncorrelated with Action Omission. Both agency and means-ends beliefs about Self were negatively correlated with Action Omission in grade 6, although these relationships were only marginally significant. In contrast, at younger ages these beliefs were lowly and positively correlated with Action Omission. Although there were no age-related decreases in the mean levels of Action Omission, this finding may indicate that the meaning of this strategy changes with age in the context of children's friendships.

Seeking Help was positively correlated with each of the agency and means-ends beliefs dimensions and there were no developmental differences in the strengths of correlations. Both agency and means-ends beliefs about Adults evinced stronger relationships with Seeking Help than beliefs about Self and Luck.

The results with regard to the relationships of agency and means-ends beliefs and Goal Difficulty provided some evidence for both presence and lack of differentiation among belief types. On the one hand the patterns of relationships and age-related differences in these relationships were similar across belief systems. Specifically, across grades 3 to 5 each dimension of agency and means-ends beliefs, with the exception of agency beliefs for Luck, was significantly and positively related to Goal Difficulty, although these relationships were only low. Thus, contrary to the predictions, none of the agency beliefs evinced a negative correlation with Goal Difficulty across grades 3 to 5. However, in grade 6 agency and means-ends beliefs about Self and Adults tended to be negatively related to Goal Difficulty. Hence, developmental differences in relationships with Goal Difficulty were also similar across belief systems and in predicted directions. However, agency beliefs about Luck was the single belief dimension which was not reliably correlated with Goal Difficulty across all grade levels. The relationship of means-ends beliefs about Luck and Goal Difficulty was significantly stronger

than the relationship of agency beliefs about Luck and Goal Difficulty ( $z = -4.92$ ,  $p = <.01$ , two-tailed test). Thus, on average, means-ends beliefs were more highly correlated with Goal Difficulty than the agency beliefs.

Table 6 provides an overview about the relationships of agency and means-ends beliefs and the various measures of friendship outcomes (i.e., number of mutual friendships, self-rated and friend-rated friendship quality). As shown in the table, the relationships of agency and means-ends beliefs with friendship outcomes provide further evidence for differentiation among belief types. The exception were the relationships of agency and means-ends beliefs with self-rated Intimacy and the relationships of beliefs about Adults and self-rated Conflict.

Specifically, across all age groups, agency and means-ends beliefs about Self, Luck, and Adults evinced positive relationships with self-rated Intimacy. Thus, the expected negative correlations of external means-ends beliefs and Intimacy did not evince at older ages. In addition, the patterns of relationships were similar across belief systems. For both agency and means-ends beliefs, self-related beliefs, on average, evinced stronger relationships with Intimacy than beliefs about external means. As has been the case for the relationships of agency and means-ends beliefs and Intimacy, both agency and means-ends beliefs about Adults evinced similar relationships with Conflict and similar age-related changes in these relationships. Specifically, across the younger age groups (i.e., grades 3 and 4), both agency and means-ends beliefs about Adults were moderately strongly and positively related to Conflict while they were uncorrelated with Conflict across the older age groups (i.e., grades 5 and 6).

In contrast, beliefs about Self and Luck showed differences in their relationships with Conflict across the agency and means-ends beliefs systems. Across all age groups agency beliefs about Luck were invariantly uncorrelated with Conflict. In contrast, means-ends beliefs about Luck were weakly and positively correlated with Conflict across all age groups with the exception of grade 5. In grade 5 means-ends beliefs about Luck were not reliably correlated with Conflict. Both agency and means-ends beliefs for Self were invariantly uncorrelated with Conflict across grades 3 and 4. Across the older age groups (i.e., grades 5 and 6) means-ends beliefs about Self evinced, as hypothesized, a negative relationships with Conflict. However, the corresponding agency beliefs remained nonreliably correlated with Conflict at older ages

and, thus, failed to evince the hypothesized negative relationship with Conflict. As a consequence, in grade 6 all dimensions of the agency beliefs were uncorrelated with Conflict while means-ends beliefs about Self and Luck were significantly correlated with this friendship aspect. Importantly, these relationships were, as hypothesized, in opposite directions. The more children perceived that self-related and controllable means are important the less conflict they perceived in their friendships. The more they perceived that Luck as an uncontrollable means is important for good friendships the more conflicts they viewed.

The results regarding the relationships of agency and means-ends beliefs and the more objective measures of friendship outcomes (i.e., number of mutual friendships and best friends' view of friendship quality) provide rather strong evidence of differentiation across belief types even at younger ages.

Specifically, across all age groups all dimensions of agency beliefs and means-ends beliefs about Self were invariantly and nonreliably correlated with the Number of Mutual Friendships. In contrast, across all age groups external means-ends beliefs (and Goal Difficulty) were invariantly and negatively correlated with the number of mutual friendships.

Moreover, agency beliefs about Self and Adults were lowly and positively correlated with the best friends' views of Intimacy, although the relationships of agency beliefs about Adults and Intimacy were only marginally significant. In contrast, means-ends beliefs (and Goal Difficulty) were not significantly related to friend-rated Intimacy. However, neither agency nor means-ends beliefs evinced a reliable relationship with friend-rated Conflict. Notably, there were no age-related differences in relationships of agency and means-ends beliefs with the Number of Mutual Friendships and friend-rated friendship quality. Thus, these findings support that children differentiated between belief types already at younger ages.

Table 6

*Overview of the Latent Correlations of Perceived Control (i.e., Agency and Means-ends Beliefs, and Goal Difficulty), and Action Strategies with Friendship Outcomes -- Are they in Hypothesized Directions across Grade Levels?*

Target Construct		Grade Level	Friendship Outcome				#
			Self: Intimacy	Self: Conflict	Friend: Intimacy	Friend: Conflict	
Agency Beliefs, Means-ends Beliefs about Self, and Direct Action							
Agency:	Self	3	+ Y		+ Y		
		4	+ Y		+ Y		
		5	+ Y		+ Y		
		6	+ Y		+ Y		
Agency:	Luck	3	+ Y				
		4	+ Y				
		5	+ Y				
		6	+ Y				
Agency:	Adults	3	+ Y	+ N	(+) Y		
		4		+ N	(+) Y		
		5	+ Y		(+) Y		
		6	+ Y		(+) Y		
Means-ends:	Self	3	+ Y				
		4	+ Y				
		5	+ Y	- Y			
		6	+ Y	- Y			
Action Strategy:	Direct Action	3	+ Y		(+) Y	(-) N	
		4	+ Y		(+) Y	(-) N	
		5	+ Y		(+) Y	(-) N	
		6	+ Y		(+) Y	(-) N	
External Means-ends Beliefs, Goal Difficulty, Seeking Help and Action Omission							
Means-ends:	Luck	3	+ Y	+ Y		- Y	
		4	+ Y	+ Y		- Y	
		5	+ N			- Y	
		6	+ N	+ Y		- Y	
Means-ends:	Adults	3	+ Y	+ Y		- Y	
		4		+ Y		- Y	
		5	+ N			- Y	
		6	+ N			- Y	
Goal Difficulty		3		+ Y		- Y	
		4		+ Y		- Y	
		5				- Y	
		6		+ Y		- Y	
Action Strategy:	Seek Help	3	+ N	+ Y			
		4	+ N	+ Y			
		5	+ N	+ Y			
		6	+ N	+ Y			
Action Strategy:	Omission	3	0 Y	+ Y			
		4	0 Y	+ Y			
		5	0 Y	+ Y			
		6	- Y	+ Y			

*Note.* # = Number of Mutual Friendships, + = positive correlation, - = negative correlation, brackets indicate marginally significant correlations ( $p < .10$ ), Y = yes, the specific correlation supports the hypotheses, N = no, the specific correlation does not support the hypotheses; for sake of clarity of the representation, nonsignificant correlations are omitted.

Finally, as seen in Table 6, Goal Difficulty and action strategies evinced significant relationships with the various measures of friendship outcomes which were in the hypothesized directions. The exception was Seeking Help which, on the one side and as expected, was invariantly positively and lowly related to friendship conflict across all age groups. On the other side and contrary to the hypotheses, this strategy was invariantly positively and lowly related to self-rated Intimacy across all age groups.

#### 4.1.2 Representation of the Higher-order Constructs of Agency and Means-ends Beliefs, and Action Strategies by Domain-Representative Parcels

Based on the findings reported in Section 4.1.1.1 providing evidence of higher-order structures of agency and means-ends beliefs and action strategies, the higher-order factors were represented by domain representative parcels (Kishton & Widaman, 1994). As a consequence, the number of variables used in structural modeling was reduced and a more defensible ratio of persons over variables was achieved. According to the rationale of domain representative parceling (cf., Kishton & Widaman, 1994) an equal number of indicators of the lower-order constructs were randomly assigned into each of the three parcels for the broader construct. Consequently, each parcel is equally representative of all lower-order constructs related to the broader higher-order constructs.

Appendix D Table D5 presents the combinations of the indicators of the lower-order constructs into the parcels of the higher-order constructs. For both the agency and the means-ends beliefs, the indicators of the lower-order constructs Effort, Ability, and Personal Attributes were randomly assigned into three parcels assessing the higher-order construct Self. The indicators of the lower-order constructs Teacher and Parents were parceled into the three indicators of the higher-order construct Adults. Similarly, the lower-order action-strategies Doing Nothing and Avoidance were randomly assigned into three parcels assessing the higher-order construct Action Omission. Note, for the agency beliefs each of the lower-order constructs was measured by six items while for the means-ends beliefs and the action strategies each of the lower-order constructs was measured by three items. Accordingly, the number of items assigned for each parcel of the higher-order constructs was larger for the agency beliefs compared to the means-ends beliefs and action strategies.

#### 4.1.3 Internal Validity and Measurement Invariance of the Investigated Constructs across Sociometric Groups of Friended and Friendless Children

In the specified MACs models children who had, at least, one reciprocated friendship and children who didn't have a reciprocated friendship represented separate groups. Thus, in terms of analyses of variance, the factor "friendship status" (friended vs. friendless children) was nested into the factor "sociometric status". However, there was no group of friendless and popular children because there were only two popular children whose friendship nominations were not reciprocated by the nominated friends (see Method Section). Hence, in total the multiple-group models were comprised of five groups (popular, average, and rejected children who had, at least, one reciprocated friendship and average, and rejected children who didn't have a reciprocated friendship).

This section first presents the assessment of internal validity and measurement invariance of agency and means-ends beliefs, action strategies, Goal Difficulty, Goal Importance, and self-rated friendship quality (i.e., unit-weight composites of the children's ratings of their first three friendships which were either reciprocated or not reciprocated by the nominated friends) across sociometric groups of friended and friendless children. In addition, measurement invariance was also assessed for the children's typical views of their mutual friendships (i.e., unit-weight composites of the children's ratings of their first three friendships which were reciprocated by the nominated friends) and the friends' typical views of friendship quality (i.e., unit-weight composites of the first three friends' views of friendship who reciprocated the children's friendship nomination). I used the latter two measures for the analyses investigating the correspondence of the children's own and their friends' views of friendship quality. Moreover, the friends' typical views of friendship quality, aside of children's self-ratings of friendship quality and the Number of mutual friendships, represents one of the outcome measures. As detailed in Section 3.4.4.5, in order to reduce statistical dependencies each of the analyses including the friends' views of friendship quality were based on slightly reduced sample sizes. Logically, these analyses included only the friended children. Thus, structural equation models specified to examine the relationships of friend-rated friendship quality and the remaining constructs included only three of the five groups of children.

In a second step, measurement equivalence for all possible combinations of the sets of agency and means-ends beliefs, action strategies, Goal Difficulty, and Goal Importance is assessed across the five target groups (popular, average, and rejected children who had, at least, one reciprocated friendship and average, and rejected children who didn't have a reciprocated friendship). In a third step, measurement equivalence of these constructs when combined with the friendship outcomes (i.e., self-rated friendship quality, the friends' typical views of friendship quality, and the Number of mutual friendships) was assessed. Importantly, the number of groups and the sample sizes differs across the three outcome measures. Specifically, self-rated friendship quality was assessed across each of the five groups. As mentioned above, for the analyses including the friends' typical views of friendship quality the sample sizes of the three sociometric groups of friended children were reduced in order to account for statistical dependencies. Finally, for the analyses using the number of mutual friendships the five groups were collapsed across friendship status (i.e., friended and friendless children). Thus, the latter analyses are based on the three sociometric groups which are comprised of both friended and friendless children.

#### 4.1.3.1 Testing Measurement Invariance of the Sets of Constructs across Sociometric Groups of Friended and Friendless Children

This section addresses the internal validity and measurement equivalence of agency and means-ends beliefs, Goal Difficulty, action strategies, Goal Importance, and self-rated friendship quality across the five target groups. For these analyses, I specified for each set of construct five-group separate MACS models. In line with the procedures established in the literature of sociometric status, friended-average children represented the first group and, thus, the comparison group for the remaining four groups.

The configural models to be tested postulated a priori that agency and means-ends beliefs, and action strategies each represent a three-factor structure. Both agency and means-ends beliefs consisted of the two higher-order constructs Self and Adults and the lower-order construct Luck. Action strategies consisted of the higher-order construct Action Omission and the two lower-order constructs Direct Action and Seeking Help. Moreover, a configural model postulating that Goal Difficulty and Goal Importance represent two factors was specified. The

configural model of self-rated friendship quality postulated a priori that friendship quality represents a two-factor structure consisting of Intimacy and Conflict.

In Table 7, I present the model testing procedures for testing measurement invariance across the five target groups separately for each set of constructs. As has been the case in Section 4.1, for each set of constructs, assessing measurement equivalence was a three-step process. First, I specified a freely estimated five-group covariance structures model (Model 1) testing the configural invariance of the salient and nonsalient loadings of the indicators on their a priori defined factors across the five target groups. Second, I specified a model testing cross-group invariance of the salient factor loadings and another model testing cross-group invariance of the salient factor intercepts. Third, I specified the measurement invariant model which combined the constraints of the previous models (i.e., cross-group constraints of the factor loadings *and* the constraints of the intercepts).

Table 7 shows that the configural models of each set of constructs (i.e., agency and means-ends beliefs, action strategies, Goal Difficulty and Importance, and self-rated friendship quality) were tenable. The models reproduced the variances and covariances of the data satisfactory well, as all fit indices uniformly indicated an acceptable fit of the proposed models<sup>60</sup>. In addition, the tolerance statistics (i.e., standardized residuals and modification indices) associated with each constrained loading (see Jöreskog & Sörbom, 1993) did not suggest a specific source of model misfit.

Following the guidelines of invariance assessment outlined in Section 3.5.5, I assessed measurement invariance across the target groups by employing a statistical rationale. For each set of constructs, enforcing invariance of the loadings (Model 2) yielded a nonsignificant  $\Delta \chi^2$  value ( $p \geq .01$ ) when compared with the configural model (Model 1). Similarly, for each set of constructs, enforcing invariance of the intercepts (Model 3) yielded a nonsignificant  $\Delta \chi^2$

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<sup>60</sup>The better (larger)  $p$  values of the present models compared to the  $p$  values of the models reported in the preparatory cross-sectional analyses (see Appendix G), are due to the sensitivity of the  $\Delta \chi^2$  values and the related  $p$  values to the differences in sample size (e.g., Bollen, 1989; see the Method section). In contrast, sample size affects the statistical power of the tests of invariance of the latent parameters in opposite direction. Thus, the statistical power to detect differences in the latent parameters across the target groups is weaker compared to the grade-level comparisons.

value ( $p \geq .01$ ) when compared with the configural model (Model 1). Finally, for each set of constructs, enforcing invariance of both the loadings and the intercepts combined (metrically invariant model, Model 4) yielded a nonsignificant  $\Delta X^2$  value ( $p \geq .01$ ) when compared with the configural model (Model 1).

Table 7

*Testing Measurement Invariance of the Constructs across Sociometric Groups of Friended and Friendless Children*

Models	Global Fit Indices							Comparison of Models			
	$X^2$	df	p	$X^2/df$	NNFI	IFI	CFI	Comparison	$\Delta X^2$	df	p
Agency Beliefs <sup>a</sup>											
1) Configural	271.86	230	.04	1.18	.98	.99	.99				
2) Loadings invariant	286.00	254	.08	1.13	.99	.99	.99	1 : 2	14.14	24	.94
3) Intercepts invariant	296.48	254	.03	1.17	.99	.99	.99	1 : 3	24.63	24	.43
4) Metric invariance	311.19	278	.08	1.12	.99	.99	.99	1 : 4	39.33	48	.81
Means-ends Beliefs <sup>b</sup>											
1) Configural	230.39	230	.48	1.00	1.00	1.00	1.00				
2) Loadings invariant	256.52	254	.44	1.01	1.00	1.00	1.00	1 : 2	26.13	24	.35
3) Intercepts invariant	262.31	254	.35	1.03	.99	.99	.99	1 : 3	31.92	24	.13
4) Metric invariance	289.65	278	.30	1.04	.99	.99	.99	1 : 4	59.26	48	.13
Action Strategies <sup>b</sup>											
1) Configural	221.87	230	.67	.96	1.00	1.00	1.00				
2) Loadings invariant	246.42	254	.72	.95	1.00	1.00	1.00	1 : 2	24.55	24	.32
3) Intercepts invariant	243.40	254	.67	.96	.99	.99	.99	1 : 3	21.53	24	.49
4) Metric invariance	260.75	278	.76	.94	.99	.99	.99	1 : 4	38.88	48	.76
Goal Difficulty and Goal Importance <sup>b</sup>											
1) Configural	124.02	120	.38	1.03	1.00	1.00	1.00				
2) Loadings invariant	136.43	136	.47	1.00	1.00	1.00	1.00	1 : 2	12.41	16	.72
3) Intercepts invariant	132.29	136	.57	.97	1.00	1.00	1.00	1 : 3	8.27	16	.94
4) Metric invariance	150.02	152	.53	.99	1.00	1.00	1.00	1 : 4	26.00	32	.76
Self-rated Friendship Quality <sup>b</sup>											
1) Configural	126.29	120	.38	1.05	.99	.99	.99				
2) Loadings invariant	150.57	136	.47	1.11	.99	.99	.99	1 : 2	24.29	16	.08
3) Intercepts invariant	142.23	136	.57	1.05	.99	.99	.99	1 : 3	15.94	16	.46
4) Metric invariance	162.50	152	.53	1.07	.99	.99	.99	1 : 4	36.21	32	.28

Note. <sup>a</sup>The RMSEA obtained with all models of this set of constructs was  $\leq .02$ . <sup>b</sup>The RMSEA obtained with all models of this set of constructs was  $\leq .01$ .

Thus, the assumption that each set of constructs has equivalent measurement properties across the target groups (i.e., metric invariance) and, consequently, are comparable across the groups was supported. Appendix M provides information about the reliable parameters (i.e., intercepts and loadings) and the uniqueness of the items for agency and means-ends beliefs,

action strategies, self-rated friendship quality, Goal Difficulty and Goal Importance (see Table H1, Table H2, Table H3, Table H4, and Table H5 in Appendix H, respectively). Table E2 in Appendix E reports the mean levels and standard deviations and Table E8 in Appendix E reports the raw correlations of the constructs.

For the analyses assessing the relationships of children's own views of mutual friendships and the friends' views of the friendships the issue of statistical dependencies had to be addressed. As described in Section 3.4.4.5, one of the dyads was randomly excluded if the two partners had only received reciprocated friendship nominations from each other, but not from any other child they had nominated. As described in Section 3.4.4.5, 14 (3.87%) children of the average group and 4 (1.10%) children of the rejected group were excluded from the analyses. Thus, dependencies were reduced by (a) randomly excluding exclusive dyads, (b) using unit-weight composites of the children's and the friends' views of the quality of the mutual friendships, and (c) using sociometric status as a blocking variable.

For testing both internal validity of the Friendship Inventory and measurement equivalence of the children's own views of mutual friendships and the friends' views of the friendships, I specified a six-group MACs model. Average children represented the first group, average children's friends represented the second group, popular children represented the third group, popular children's friends represented the fourth group, rejected children represented the fifth group, and rejected children's friends represented the sixth group. Hence, in line with the procedures established in the literature of sociometric status, average children represented the comparison group for the other sociometric groups (i.e., popular and rejected children) and for the friends of all children. The six-group MACS model was comprised of a two-factor structure consisting of Intimacy and Conflict in each group. In each group the two-factor structure was either measured by the child's ratings of Intimacy and Conflict or by the corresponding friends' ratings. As can be seen in Table D7 in Appendix D, the self-rated and the friend-rated friendship constructs (i.e., intimacy and conflict) were represented by three indicators each. As described in Section 3.4.4.4, the indicators were the same but the source of ratings (i.e., target child and friends) differed across groups. Once the two-factor structure was measured by the child's responses and once the same two-factor structure was measured by the child's best friends' responses.

In Table 8, I present the various steps of the model testing procedure for testing measurement invariance simultaneously across both sociometric groups (i.e., popular, average, and rejected children) and sources of rating of friendship perceptions (i.e., self-rated vs. friend-rated friendship quality). I started with the freely estimated six-group MACS model (Model 1) testing the configural invariance of the loadings of the indicators on their a priori defined factors (friendship intimacy and conflict) across the groups (sociometric status groups x sources of ratings). No dual factor loadings were allowed. Table 8 shows that this model was tenable. All fit indices uniformly indicated an acceptable level of fit of the proposed model.

Table 8

*Testing Measurement Invariance of Mutual Friendship Perceptions across both Sociometric-status Groups (i.e., Average, Popular, and Rejected Children) and Sources of Ratings (i.e. Self vs. Friends' Ratings)*

Models	Global Fit Indices						Comparison of Models				
	$\chi^2$	df	p	$\chi^2/df$	NNFI	IFI	CFI	Comparison	$\Delta\chi^2$	df	p
1) Configural	172.72	148	.08	1.20	.97	.98	.98				
2) Loadings invariant	203.52	164	.02	1.24	.96	.97	.97	1 : 2	30.80	20	.06
3) Intercepts invariant	181.80	164	.16	1.11	.98	.99	.99	1 : 3	9.08	20	.98
4) Metric invariance	212.98	184	.07	1.20	.97	.98	.98	1 : 4	40.26	40	.46

*Note.* The RMSEA obtained with all models was .02.

Table 8 depicts that enforcing the loadings to be invariant across the six groups resulted in a nonsignificant  $\Delta\chi^2$  value (see comparison of Model 1 versus 2). Moreover, enforcing the intercepts to be invariant across the six groups resulted in a nonsignificant  $\Delta\chi^2$  value (see comparison of Model 1 versus 3). In the metrically invariant model (Model 4) I combined the constraints of the previous two models (i.e., invariance of both factor loadings and intercepts). This model did not significantly differ from the configural invariant model (Model 1). In addition, the tolerance statistics (i.e., standardized residuals and modification indices) associated with each constrained loading (see Jöreskog & Sörbom, 1993) did not suggest a specific source of model misfit. Thus, the assumption that the constructs have equivalent measurement properties (i.e., metric invariance) and, consequently, are comparable across both sociometric groups and sources of ratings was supported. The psychometric properties of

the measured friendship perceptions were similar for the groups of popular, average, and rejected children as well as the corresponding groups of friends.

#### 4.1.3.2 Measurement Invariance of Models Combining Two or Three Sets of the Constructs across Sociometric Groups of Friendled and Friendless Children

Five-group covariance structures models combining two or three sets of constructs were specified in order to assess measurement invariance of the constructs across sociometric groups of friendled and friendless children (i.e., friendled-popular, friendled-average, and friendled-rejected children and friendless-average, and friendless-rejected children). By means of restricting the specified models to include no more than six factors, a more defensible ratio of persons over factors was achieved than if larger models would have been specified. Each set of constructs was, at least, one times combined with each of the other sets of constructs. In a first step, models combining children's agency beliefs, means-ends beliefs, action strategies, Goal Difficulty, and Goal Importance were specified. In a second step, models combining each of the previous sets of constructs with one of the friendship outcomes (i.e., self-rated friendship quality, the friends' typical views of friendship quality, and the Number of mutual friendships) were specified.

Table I1 in Appendix I shows the global fit indices and the results of the assessment of measurement invariance across the five target groups of the models that combined agency beliefs, means-ends beliefs, action strategies, Goal Difficulty, and Goal Importance. Each of the models evinced satisfactory levels of overall model fit. Specifically, none of the practical fit indices (i.e., NNFI, IFI, and CFI) of the models was smaller than .90 with the exception of the model testing configural invariance of Action Strategies, Goal Difficulty, and Goal Importance. The NNFI of this model was .89. However, both the IFI, and CFI of this model were .92 indicating satisfactory levels of fit. Finally, the RMSEAs of each of the models were consistently not larger than .03.

When invariance the loadings was enforced, the overall model fit was still acceptable for all models combining two or three sets of constructs. In addition, for each combination of constructs when comparing the configural invariant model with the measurement invariant models the resulting  $\Delta X^2$  value was nonsignificant. Thus, the assumption that the constructs have equivalent measurement properties (i.e., metric invariance) and, consequently, are

comparable across groups was supported. Moreover, the factor structures of each set of constructs, as assessed in the previous Section, remained tenable when combined with each of the other sets of constructs. More specifically, the indicators designed to assess a specific construct of the various sets of constructs did not emerge cross-loadings on constructs of another set of constructs. These findings provide further support for construct validity of the various sets of constructs investigated in this study.

Table I2 in Appendix I shows the global fit indices and the results of the assessment of measurement invariance of the models that combined each of the previous sets of constructs with self-rated friendship quality across the five groups. Specifically, models combining the following sets of constructs were specified: (a) agency beliefs, Goal Importance, and self-rated friendship quality, (b) means-ends beliefs, Goal Difficulty, and self-rated friendship quality, and (c) action strategies and self-rated friendship quality. When invariance the loadings was enforced, the overall model fit was still acceptable. In addition, when comparing the configural invariant model with the measurement invariant models the resulting  $\Delta\chi^2$  value was nonsignificant. Thus, the assumption that the constructs have equivalent measurement properties and, consequently, are comparable across groups was supported.

Another set of three-group SEM models used the previously employed combinations of constructs but they included the friends' views of friendship quality instead of self-rated friendship quality. As described above for the measurement -invariant 6-group model, the dyads of children who nominated exclusively each other were excluded in order to reduce statistical dependencies. Thus, the sample sizes of the three sociometric groups of friended children were smaller compared to the corresponding sample sizes of the previous analyses. Table I3 in Appendix I shows the global fit indices and the results of these analyses. When invariance the loadings was enforced, the overall model fit was still acceptable. In addition, when comparing the configural invariant model with the measurement invariant models the resulting  $\Delta\chi^2$  value was nonsignificant. Hence, the assumption that the constructs have equivalent measurement properties and, consequently, are comparable across groups was supported.

Another set of three-group SEM models used the the previously employed combinations of constructs for the number of mutual friendships. As mentioned above, the three groups

were comprised of the total number of average, popular, and rejected children. The number of mutual friendships was represented by a single indicator in each of the specified SEM<sup>61</sup> models and, hence, it was represented as error-free variable. For each sociometric group the number of mutual friendships ranged between 0 and 3 with the exception of the group of rejected children where the maximum number of friends did not exceed 2. Table E2 in Appendix E provides the descriptive statistics of the Number of mutual friendships separately for each sociometric group. As seen in this table, the distributional characteristics of this variable did not violate assumptions of normality across sociometric groups (e.g., Tabachnick & Fidell, 1989). Table I4 in Appendix I shows the global fit indices of the specified three-group models. Each of the models evinced satisfactory levels of overall model fit. Specifically, none of the practical fit indices (i.e., NNFI, IFI, and CFI) of the models was smaller than .98 and the RMSEA consistently did not exceed .02. In addition, none of the  $\chi^2$  values of the models was significant.

#### 4.1.4 Homogeneity of Latent Variances of the Constructs across Sociometric Groups of Friendled and Friendless Children

Appendix J presents the modeling procedures and results of assessing invariance of the factor variances across the five target groups (i.e., friendled-popular, friendled-average, and friendled-rejected children and friendless-average and friendless-rejected children). The results show that with few exceptions the factor variances of the constructs were invariant across the target groups. Specifically, the factor variances of agency beliefs about Self, and Adults, all dimensions of means-ends beliefs, Goal Difficulty, Direct Action, Action Omission, Goal Importance and Intimacy were invariant across groups.

The group of friendled-rejected children had more heterogeneous agency beliefs about Luck ( $\beta$  ( $z = 9.79$ ;  $se = .12$ ) = 1.20) than the remaining groups of children where it was fixed to 1. Popular children had more homogeneous means-ends beliefs about Luck ( $\beta$  ( $z = 8.94$ ;  $se = .08$ ) = 0.73) than the remaining groups. The variance of Seeking Help was larger in the group of

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<sup>61</sup> The model combining action strategies and Number of mutual friendships, in addition, included the means structures in order to estimate the latent mean levels of the Number of mutual friendships. Importantly, the results of the analyses of the covariance structures are not affected by such differences in model specification.

friended-average children where it was fixed to 1 compared to the remaining four groups of children ( $\beta$  ( $z = 10.98$ ;  $se = .08$ ) = 0.84).

Finally, friended-rejected children had more heterogeneous views of Conflict ( $\beta$  ( $z = 6.82$ ;  $se = .19$ ) = 1.27) than friended-average and popular as well as friendless-average and friendless-rejected children. Investigating children's mutual friendship perceptions yielded similar results. Only friendship ratings of relationships which were reciprocated by the nominated friend entered the analyses while in the previous analyses, children's typical views of friendship quality were included without selecting for the ratings referring to reciprocated friendship nominations (see Method Section 3.4.4.4 for a description of the aggregation procedures of the indicators assessing children's typical view friendship quality, and children's own and their friends' views of the mutual friendship relationships). Specifically, rejected children's conflict perceptions were equally variable as the friends' conflict perceptions ( $\beta$  ( $z = 10.08$ ;  $se = .16$ ) = 1.57) and both views of Conflict were more heterogeneous than average and popular children's own and their friends' views of Conflict. The latter groups of children did not differ with regard to the variability of their conflict perceptions. Finally, the analyses showed that the variances of Intimacy were invariant across both sociometric groups and sources of ratings (i.e., the children vs. their friends).

#### 4.1.5 Effects of Gender on the Constructs across Sociometric Groups of Friended and Friendless Children

Appendix J also presents the modeling procedures and results of assessing invariance of the effects of Gender. The results show that with few exceptions Gender invariantly did not affect the constructs across the five target groups (i.e., friended-popular, friended-average, and friended-rejected children and friendless-average and friendless-rejected children). Specifically, boys and girls invariantly did not differ in their means-ends beliefs, action strategies, and Goal Difficulty. With a single exception, there were invariantly no gender differences in children's agency beliefs. The exception was that in the group of friendless-average children, girls endorsed agency beliefs about Adults significantly more strongly than boys ( $\beta$  ( $z = 3.38$ ;  $se = .16$ ) = .54).

Popular girls viewed friendship goals significantly more important than popular boys ( $\beta$  ( $z = 2.69$ ;  $se = .13$ ) = .34) while there were invariantly no gender-related differences in the remaining groups.

Finally, the results showed that girls viewed the friendships more intimate than boys ( $\beta$  ( $z = 3.02$ ;  $se = .05$ ) = .16) while there was no significant difference between girls and boys with regard to Conflict perceptions ( $\beta$  ( $z = 0.41$ ;  $se = .06$ ) = .03). The latter results were replicated in the analyses of children's own views of their mutual friendships and their friends' typical views of the friendships. Specifically, these analyses also showed that girls perceived the friendships more intimate than boys ( $\beta$  ( $z = 3.86$ ;  $se = .04$ ) = .16) while gender did not significantly affect the children's and their friends' perceptions of the amount conflict ( $\beta$  ( $z = -1.21$ ;  $se = .05$ ) = -.06). These results are in line with studies showing that girls tend to perceive their friendships to be more intimate than boys (e.g., Buhrmester, 1990; Buhrmester & Furman, 1987; Parker & Asher, 1993; Patterson et al., 1990).

#### 4.1.6 Linear and Quadratic Effects of Grade on the Constructs across Sociometric Groups of Friendled and Friendless Children

Appendix J also presents the modeling procedures and results of assessing invariance of the linear and quadratic effects of grade across the five target groups (i.e., friendled-popular, friendled-average, and friendled-rejected children and friendless-average and friendless-rejected children). With a single exception, the results, generally, replicated the mean-level differences (and lack thereof) found in the developmental analyses (see Appendix G).

The exception was that Seeking Help ( $\beta$  ( $z = 2.93$ ;  $se = .06$ ) = .17) invariantly showed a significant linear age-related increase across the five groups while in the cross-sectional age comparisons there were no significant differences in the mean levels of this construct across grade levels. However, the developmental comparisons were based on the overall sample while in the present analyses only popular, average, and rejected children were selected. With regard to the remaining action strategies, the results were in line with the findings of the developmental analyses. Across the five target groups, Direct Action ( $\beta$  ( $z = 4.78$ ;  $se = .06$ ) = .28) invariantly showed a significant linear age-related increase while Action Omission did not evince a reliable linear mean-level trend ( $\beta$  ( $z = -1.50$ ;  $se = .06$ ) = -.09).

Moreover, no significant nonlinear effects of age on the constructs evinced with a single exception. The exception was Goal Difficulty which showed a significant positive and linear age-related increase ( $\beta$  ( $z = 4.76$ ;  $se = .06$ ) = .27) that was slowed by a significant negative and quadratic age-related trend ( $\beta$  ( $z = -2.29$ ;  $se = .05$ ) = -.13). Hence, the mean-level trajectory of Goal Difficulty followed an inversely U-shaped curvature.

Across the five target groups, agency beliefs for Self invariantly showed a linear age-related increase ( $\beta$  ( $z = 2.18$ ;  $se = .05$ ) = .10) while the mean levels of both agency beliefs about Luck and Adults linearly decreased with age ( $\beta$  ( $z = 2.36$ ;  $se = .05$ ) = -.11;  $\beta$  ( $z = 2.71$ ;  $se = .05$ ) = -.13, respectively).

With regard to children's means-ends beliefs about Adults, grade significantly interacted with sociometric status and friendship status. In the group of popular children, means-ends beliefs about Adults did not show a significant linear effect of age ( $\beta$  ( $z = -0.27$ ;  $se = .10$ ) = -.03) while this belief invariantly showed a significant negative and linear trend ( $\beta$  ( $z = -6.15$ ;  $se = .06$ ) = -.39) across the remaining groups of children. In contrast, the effects of grade on means-ends beliefs about Luck and Self did not interact with sociometric status and friendship status. Across all five target groups, means-ends beliefs for Luck significantly and linearly decreased with increasing age ( $\beta$  ( $z = -2.79$ ;  $se = .05$ ) = -.14). Across all groups means-ends beliefs about Self invariantly were not significantly affected by linear effects of age ( $\beta$  ( $z = 1.77$ ;  $se = .05$ ) = .09).

With regard to children's ratings of friendship quality, grade significantly interacted with sociometric status and friendship status. Across the groups of popular and friended-rejected children Intimacy showed an age-related linear increase ( $\beta$  ( $z = 2.35$ ;  $se = .09$ ) = .22) which was invariant across the two groups. In contrast, across the groups of friended-average children, friendless-average children, and friendless-rejected children the linear influence of grade on Intimacy invariantly did not significantly differ from zero ( $\beta$  ( $z = -1.47$ ;  $se = .06$ ) = -.09).

As seen in Table J2 in Appendix J, the linear effects of grade on Conflict did not interact with sociometric status and friendship status. Across all five target groups the linear effects of age on Conflict did not reliably differ from zero ( $\beta$  ( $z = 1.26$ ;  $se = .06$ ) = .08).

When analyzing only friendship ratings of relationships which were reciprocated by the nominated friends, similar patterns of results evinced regarding age-related differences in

children's views of friendship quality as when analyzing friendship ratings including reciprocated and nonreciprocated friendship nominations. With age rejected children themselves tended to perceive the mutual friendships increasingly more to be intimate ( $\beta$  ( $z = 2.45$ ;  $se = .04$ ) = .11). Thereby, the linear age-related trend of Intimacy in the group of rejected children did not differ from the corresponding trends in the groups of average and popular children and the groups of average and popular children's friends. The finding of an age-related linear increase in popular and friended-rejected children's views of Intimacy replicates the findings of the previous analyses on children's views of both reciprocated and not reciprocated friendships. However, friended-average children's views of Intimacy increased only if they referred to mutual friendships while there was no age-related increase in average children's views of Intimacy if both reciprocated and not reciprocated friendships were considered. The finding that friended-average children's views of Intimacy showed no age-related increase if both reciprocated and not reciprocated friendships were considered may be related to the finding of a meta-analysis showing that not reciprocated (i.e., unilateral) friendships are less intimate than reciprocated friendships (Newcomb & Bagwell, 1995). Given that average children are more likely to nominate friends who don't reciprocate the nomination than popular children, average children's ratings of unilateral friendships are more likely to result in lower mean levels of the combined friendship ratings compared to popular children's ratings of unilateral friendships. Hence, for the group of average children the age-related increase in the mean levels of mutual friendships may be attenuated by their ratings of unilateral friendships if the unit-weight composites of both ratings are considered.

Importantly, with increasing age rejected children's friends' ratings of friendship of Intimacy declined ( $\beta$  ( $z = -2.06$ ;  $se = .21$ ) = -.44). The finding that rejected children's friends' views of Intimacy declined with age while, at the same time, rejected children's own views of Intimacy increased indicates that with age the discrepancies between rejected children's own and their friends' perceptions of Intimacy increased.

In line with the results of the analyses investigating the unit-weight composites of both reciprocated and unilateral friendships, children's own views of Conflict and their friends' views of Conflict were unaffected by linear effects of grade ( $\beta$  ( $z = -0.11$ ;  $se = .05$ ) = -.01).

#### 4.1.7 Summary of the Results of the Preparatory Analyses

The preparatory analyses provided evidence that agency and means-ends beliefs, and action strategies could be invariantly represented by higher-order structures across grade levels. Beliefs for the means Effort, Ability, and Personal Attributes could be represented as a higher-order construct, termed Self, in both the agency and means-ends belief systems. Beliefs about the means Parents and Teachers as Powerful Others could be represented as a higher-order construct, termed Adults as Powerful Others for both the agency and means-ends beliefs. The action strategies Doing Nothing and Avoidance could be represented as a higher-order construct, termed Action Omission.

Cross-sectional age comparisons supported the assumption that children's understanding that Luck and adults' help are uncontrollable causes while self-related means are more controllable increases. This was indicated by (a) an unexpected increase in beliefs about Self, (b) expected declines in mean levels of beliefs about Luck and Adults, and (c) an expected drop in correlations of beliefs about Luck and the remaining belief dimensions, although, beliefs about Adults, unexpectedly, were not involved in these developmental differences.

Moreover, the findings showed that children differentiated only to a low degree between agency and means-ends beliefs in the domain of friendship across the investigated age range. As a consequence, the findings did not provide evidence for the expected negative relationships of external means-ends beliefs with Direct Action and Self-rated Intimacy at older ages. However, the relationships with the remaining friendship outcomes (i.e., number of mutual friendships, friend-rated friendship quality, and self-rated Conflict) provided some support for differentiation between belief types, in part, even at younger ages.

Generally, correlations which were hypothesized to be negative were either unreliable or low and positive. As a consequence, beliefs, action strategies, and self-rated friendship quality showed patterns of salient and nonsalient relationships. With development the patterns of salient and nonsalient relationships were even more pronounced. However, in the vast majority of cases drops in strength of relationships evinced for the oldest group only. For example, the hypothesized relationship of agency beliefs about Self and Action Omission was  $r = .15$  at younger ages. For the oldest children this relationship tended to be negative but did not reach conventional levels of significance. The findings showed that beliefs about

specific means were differentially related to specific action strategies. Self-related beliefs were more strongly related to direct problem-solving strategies compared to beliefs about external means. Help-seeking behaviors were more highly related to beliefs about Adults compared to both beliefs about Self and Luck. For the oldest group, only beliefs about Luck were related to Action Omission.

The result of the linear effects of age, generally, replicated the above reported mean-level differences. With regard to children's means-ends beliefs about Adults, linear grade effects significantly interacted with sociometric status and friendship status. In the group of popular children, means-ends beliefs about Adults did not show a significant linear effect of age while these beliefs invariantly showed a significant negative and linear trend across the remaining groups of children.

With regard to self-rated Intimacy, linear grade effects significantly interacted with sociometric status and friendship status. Intimacy showed an age-related linear increase across the groups of popular and friended-rejected children while there were no age effects on this friendship aspect across the groups of friended-average children, friendless-average children, and friendless-rejected children. Importantly, at the same time, as rejected children's own views of Intimacy increased, rejected children's friends' views of Intimacy declined with age. Thus, with age the discrepancies between rejected children's own and their friends' perceptions of Intimacy increased.

Moreover, the results show that, with few exceptions, Gender did not affect the constructs across the five groups. The exceptions were that in the group of friendless-average children, girls endorsed agency beliefs about Adults significantly more strongly than boys. Popular girls viewed friendship goals significantly more important than popular boys. Girls viewed the friendships more intimate than boys while there was no significant difference between girls and boys with regard to conflict perceptions.

Furthermore, the results show that with few exceptions the factor variances of the constructs were invariant across the target groups. The exceptions were that the group of friended-rejected children had more heterogeneous agency beliefs about Luck than the remaining groups of children. Popular children had more homogeneous means-ends beliefs about Luck than the remaining groups. The variance of Seeking Help was larger in the group

of friended-average children compared to the remaining four groups. Furthermore, both rejected children's own and their friends' conflict perceptions were more heterogeneous than average and popular children's own and their friends' conflict perceptions.

Finally, the preparatory analyses provided evidence for the internal validity and measurement equivalence (i.e., metric invariance) of the constructs (i.e., agency and means-ends beliefs, Goal Difficulty, action strategies, Goal Importance, self-rated friendship quality) across groups of friended and friendless popular, average, and rejected children. Moreover, it was shown that the psychometric properties of perceptions of the quality of mutual friendships were similar for the groups of popular, average, and rejected children as well as the corresponding groups of friends. In order to account for statistical dependencies in the measures models including the friends' perceptions of friendship quality are based on smaller sample sizes. In these cases, dyads of children who mutually nominated only each other were randomly excluded from the analyses. Moreover, evidence for both internal validity and measurement equivalence was provided if the constructs are combined with each other and with the number of mutual friendships. Notably, models including the number of mutual friendships are based on the total numbers of popular, average, and rejected children; that is, these three-group models do not differentiate between friended and friendless children.

The metrically invariant models represented the baseline models of the comparisons which were conducted in the following main section. The constrained models testing the target hypotheses were nested in metrically invariant models. I notify cases when more restricted models, also nested in the metrically invariant models, were appropriate to be used as the baseline models for comparisons.

## **4.2 Does Children's Sociometric Status Moderate the Relationships among Perceived Control, Action Strategies, and Friendship Outcomes (i.e., Friend-rated Friendship Quality and Number of Mutual Friendships)?**

### **4.2.1 Do Rejected Children who have Mutual Friends Overestimate their Perceived Control whereas Friendless Children have Low Perceptions of Control?**

In the first set of models I tested the hypothesized differences in the mean levels of agency and means-ends beliefs, action strategies, Goal Difficulty, and self-rated friendship quality across friended and friendless popular, average, and rejected children. Specifically, for each construct a significant main effect of friendship status (i.e., friended vs. friendless children), a nonsignificant main effect of sociometric status, and a lack of interaction effects were expected. In addition, I tested whether children's own and their friends' views of the quality of their mutual friendships replicate previous findings showing that rejected children overestimate the quality of their friendships compared to their friends' views (e.g., Brendgen et al., 2000). Moreover, I tested whether the number of mutual friendships is related to children's sociometric status. Finally, I tested the hypotheses that the relationships among perceived control, action strategies, and children's own views of friendship quality are invariant across sociometric groups of friended and friendless children.

Following the guidelines of invariance assessment outlined in section 3.5.5, I assessed invariance of the latent parameters across age groups by employing a statistical rationale. Following the propositions of Section 3.5.6, the significance level for accepting the alternative hypotheses of existing differences in the latent mean levels was set at  $p \leq .05$ . In contrast, the significance level for accepting the null hypotheses of invariance of the latent correlations was set at  $p \leq .10$ .

#### 4.2.1.1 Mean-level Differences in Perceived Control (i.e., Agency and Means-ends Beliefs, Goal Difficulty), and Action Strategies across Sociometric Groups of Friended and Friendless Children

4.2.1.1.1 Agency beliefs. As shown in Table 9 (see also Figure 8 for a summary of the results), the multivariate tests of invariance of the mean levels of the agency beliefs about Self, Luck, and Adults failed to reach the set significance level (i.e.,  $p \leq .05$ , see Section 3.5.6) for accepting the alternative hypotheses of existing differences in the latent mean levels (see Model 1 vs. 2). Thus, the results showed that there were no mean-level differences in the agency beliefs across the groups.

4.2.1.1.2 Means-ends beliefs. The multivariate tests of invariance of the mean levels of the means-ends beliefs about Self, Luck, and Adults evinced a significant loss in fit when compared with the metrically invariant model (see Table 9; comparison of Model 1 vs. Model 2).

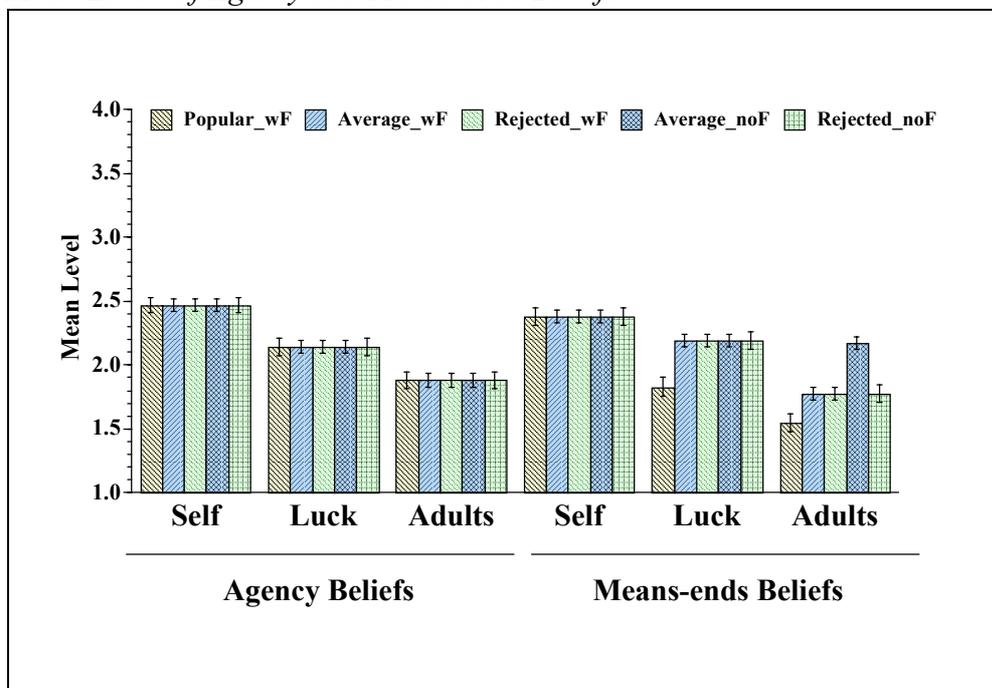
The conducted univariate tests showed that the external belief dimensions (i.e., Luck and Adults) accounted for the significant loss in fit of the multivariate test (see comparison of Model 1 vs. Model 4 and comparison of Model 1 vs. Model 5, for means-ends beliefs about Luck and Adults, respectively). In contrast, the univariate test of cross-group invariance of the mean levels of the dimension Self did not yield a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 3).

Relaxing the invariance constraint of means-ends beliefs about Luck in the popular group resulted in a significant increment in fit when compared to the previous model (see comparison of Model 4 vs. Model 4a), and a nonsignificant difference in fit when compared to the metric invariant Model (see comparison of Model 1 vs. Model 4a). Relaxing the invariance constraint of means-ends beliefs about Adults in the popular group and in the group of friendless-average children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 5 vs. Model 5a), and a nonsignificant difference in fit when compared to the metric invariant Model (see comparison of Model 1 vs. Model 5a).

As shown in Figure 8, popular children significantly regarded Luck as less important for attaining good friendship outcomes ( $\alpha$  ( $z = -3.28$ ;  $se = .11$ ) =  $-.36$ ) than the other groups of

children. Similarly, they believed less in the usefulness of help provided by adults ( $\alpha$  ( $z = -2.34$ ;  $se = .10$ ) =  $-.23$ ) than the other groups. Hence, contrary to the hypotheses (see Hypotheses Chapter, Prediction A1), friendless children did not evince higher levels of means-ends beliefs about both Luck and Adults, with a single exception. Friendless-average children believed more in the usefulness of adults' help ( $\alpha$  ( $z = 2.16$ ;  $se = .18$ ) =  $.39$ ) than the remaining groups of children. However, compared to the friendless groups of children and the friended-average group of children, popular children believed less in the usefulness of both Luck and Adults for attaining good friendship outcomes.

Figure 8  
*Mean Levels of Agency and Means-ends Beliefs*



Note. wF = friended children, noF = friendless children

4.2.1.1.3 Goal Difficulty. As seen in Table 9, the univariate test of invariance of the mean levels of Goal Difficulty resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 versus Model 2). Relaxing the invariance constraints in the groups of popular children, friended-rejected children, and friendless-rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta X^2$

value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a). On a significance level of  $\alpha < .20$ , constraining Goal Difficulty to be equal across the groups of friended-rejected children and friendless-rejected children resulted in a nonsignificant increment in fit when compared to the previous model (see comparison of Model 2a versus Model 2b).

Table 9  
*Testing Invariance of the Latent Mean Levels of Agency and Means-ends Beliefs, Action-Strategies, Goal Difficulty, and Self-rated Friendship Quality across Sociometric Groups of Friended and Friendless Children*

Metrically inv. (i.e., Baseline)		Test	$\Delta$					
$\chi^2$	df	Model Description	$\chi^2$	df	Comp.	$\Delta\chi^2$	df	p
Agency Beliefs								
1) 311.19	341a	2) All three dimensions inv.	330.71	353	1 : 2	19.52	12	.08
Means-ends Beliefs								
1) 289.65	341a	2) All three dimensions inv.	311.20	353	1 : 2	21.55	12	.04
		3) Dimension Self inv.	293.20	345	1 : 3	3.55	4	.47
		4) Dimension Luck inv.	301.95	345	1 : 4	12.30	4	.02
		4a) Popular: Luck free	291.60	344	1 : 4a	1.95	3	.58
				4 : 4a		10.35	1	<.01
		5) Dimension Adults inv.	299.65	345	1 : 5	10.00	4	.04
		5a) Popular: Adults free	290.33	344	1 : 5a	0.65	2	.72
		Friendless-Average: Adults free			5 : 5a	9.35	2	<.01
Goal Difficulty								
1) 150.02	194b	2) Difficulty inv.	161.63	198	1 : 2	11.61	4	.02
		2a) Popular, Friended-Rejected, Friendless-Rejected: Difficulty free	150.40	195	1 : 2a	0.38	1	.54
					2 : 2a	11.23	3	.01
		2b) Friended-Rejected, Friendless-Rejected: Difficulty inv.	150.45	196	2a : 2b	0.42	2	.81
Action Strategies								
1) 260.75	341a	2) All three strategies inv.	280.47	353	1 : 2	19.72	12	.07

*Note.* inv. = invariant, Comp. = Comparison. By fixing the loadings of the measurement model the here reported measurement invariant models gained a = 54 df and b = 42 df.

The results show, contrary to the hypotheses, that there was a significant main effect of sociometric status while there was no significant main effect of friendship status. Both rejected groups perceived the goal of having friends significantly more difficult ( $\alpha$  ( $z = 2.61$ ;  $se = .14$ ) = .36) than friended-average children. Friendless-average children did not differ from

their friended counterparts who represented the reference group of the mean-level comparisons where the mean levels were fixed to 0. The group of popular children perceived the goal significantly less difficult than the average children ( $\alpha$  ( $z = -2.18$ ;  $se = .11$ ) =  $-.25$ ). Thus, the rank ordering according to mean levels of Goal Difficulty was the following: friended-popular children < friended-average and friendless-average children < friended-rejected and friendless-average children.

4.2.1.1.4 Action Strategies. As shown in Table 9, the multivariate tests of invariance of the mean levels of the Action Strategies of Direct Action, Seeking Help, and Action Omission failed to reach the set significance level (i.e.,  $p \leq .05$ , see Section 3.5.6) for accepting the alternative hypotheses of existing differences in the latent mean levels (see Model 1 vs. 2). Hence, there were no significant mean-level differences in Direct Action, Action Omission, and Seeking Help.

4.2.1.2 Additional Analyses: Mean-level Differences in Friendship Outcomes (i.e., Children's Typical Views of Friendship Quality, Self ratings and Friend ratings of Mutual Friendships, and Number of Mutual Friendships)

Appendix P describes the modeling procedures and results with regard to tests of latent differences in children's typical views of friendship quality, self ratings and friend ratings of mutual friendships, and the number of mutual friendships.

4.2.1.2.1 Children's typical views of friendship quality. As detailed in Appendix K, the mean levels of Conflict did not differ across the five target groups while they did for Intimacy. As expected, friendless-rejected children perceived the relationships less intimate ( $\alpha$  ( $z = -3.73$ ;  $se = .17$ ) =  $-.62$ ) than friended-average children. However, the expected mean-level difference between friendless-average children and friended-average children did not evince. Moreover, popular children perceived the relationships more intimate than average children ( $\alpha$  ( $z = 2.70$ ;  $se = .13$ ) =  $.35$ ).

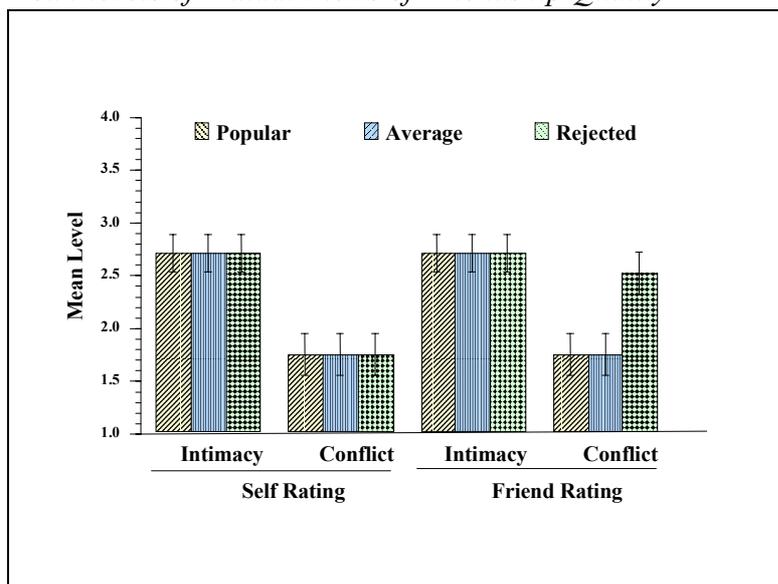
Thus, the evinced rank ordering according to mean levels of Intimacy was: popular children > friended-average children = friended-rejected children = friendless-average children > friendless-rejected children.

4.2.1.2.2 Self ratings and friend ratings of mutual friendships. Figure 9 depicts the results of the mean level comparisons of children's own and their friends' views of their mutual friendships. As seen in the figure, friended children's own views of Intimacy did not differ across sociometric groups. However, the friends' views of Intimacy also did not differ from the children's own views and, at same time, across sociometric groups.

Importantly, the result of equal mean levels of self-rated Intimacy across groups of popular, average, and rejected children differs from the previously reported result that popular children had higher mean levels compared to the remaining groups of children. However, the analyses differed in two important aspects which may explain the differences in the results. Firstly, they differed in the sample sizes which affect the statistical power to detect differences among groups, and the analyses differed in the investigated self-ratings. In the previously conducted analyses self-rated friendship quality was not selected for reciprocity while in the analyses investigating children's mutual friendship perceptions they were (for details see Appendix K).

Importantly, as depicted in Figure 9, rejected children's friends perceived the relationships significantly more conflictual ( $\alpha$  ( $z = 2.74$ ;  $se = .28$ ) = .77) than the rejected children themselves and average and popular children's friends.

Figure 9  
*Mean-levels of Mutual Views of Friendship Quality*



Follow-up comparisons (i.e., t-test for dependent samples) showed that at older ages (i.e., grades 5 and 6) rejected children's views of Intimacy ( $\underline{M} = 3.13$ ,  $\underline{SD} = .81$ ) were significantly higher than the friends' views of this friendship feature ( $\underline{M} = 2.36$ ,  $\underline{SD} = .79$ ),  $t_{(19)} = 3.44$ ,  $\eta^2 = .06$ ,  $p < .01$ . Moreover, a conducted t-test for independent samples indicated that in grades 5 and 6 the views of rejected children's friends of Intimacy were significantly lower than average children's friends' views ( $\underline{M} = 2.70$ ,  $\underline{SD} = .65$ ),  $t_{(112)} = 2.00$ ,  $\eta^2 = .03$ ,  $p < .05$ . The age-related decline of rejected children's friends' views of Intimacy is in line with the finding that the effects of reputational biases which are related to sociometric status are stronger at the end of middle childhood (Waas & Honer, 1990).

Another set of follow-up comparisons examined whether the sample composition and the operationalization of Intimacy may explain why the present study failed to replicate the findings of Brendgen et al. (2000). In the present study, rejected children had a higher percentage (21%) of reciprocal relationships with friends who were also rejected than the five percent that have been found by Brendgen et al. (2000). Hence, it was possible that in the present study the mean levels of rejected children's friends' views of intimacy were upwardly biased by friends who are themselves rejected while this was not the case in the previous study.

In order to test this assumption, I removed the dyads which were exclusively comprised of rejected children. A conducted t-test for independent samples comparing average children's friends' views of Intimacy ( $\underline{n} = 205$ ,  $\underline{M} = 2.66$ ,  $\underline{SD} = .63$ ) with rejected children's friends' views ( $\underline{n} = 37$ ,  $\underline{M} = 2.47$ ,  $\underline{SD} = .85$ ) revealed that the friends' views were not significantly different;  $t_{(43.4)} = 1.30$ ,  $\eta^2 = .01$ ,  $p = .20$ <sup>62</sup>. Hence, the assumption that differences in the composition of the friendship dyads across studies may explain the differences in the results of the studies was not supported.

Brendgen et al.'s findings that rejected children's friends perceived the relationships less intimate than the rejected children themselves may be due to their measure of Intimacy which

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<sup>62</sup> I used the t-value which is based on separate estimates of the standard errors because the variances of average and rejected children's friends' views were not equal,  $F(36,204) = 1.83$ ,  $p = .01$ .

encompassed both Liking and Intimate Friendship Action. In contrast, in the present study Intimacy encompassed only the latter because Liking also represents one defining dimension of sociometric status. Thus, I tested whether Liking shows the expected mean level differences across the sources of rating.

Specifically, I conducted a 3 (sociometric status) X 2 (source of rating) MANOVA, with source of rating as within-subjects factor. Both the main effect for sociometric status and source of rating ( $F_{(2, 359)} = 4.80, p < .01$  and  $F_{(1, 359)} = 9.04, p < .01$ , respectively) and the interaction term were significant ( $F_{(2, 359)} = 5.25, p < .01$ ). A performed follow-up ANOVA showed that the mean levels of self-rated Liking ( $M = 3.29, SD = 0.57, M = 3.36, SD = 0.57$ , and  $M = 3.29, SD = 0.57$  for average, popular, and rejected children, respectively) were not significantly different across sociometric groups ( $F_{(2, 359)} = 0.43, p = .65, \eta^2 = .002$ ).

In contrast, the mean levels of friend-rated Liking were significantly different ( $F_{(2, 359)} = 9.63, p < .01, \eta^2 = .05$ ). A conducted t-test for independent samples indicated that rejected children's friends views of of Liking ( $M = 2.92, SD = 0.90$ ) were significantly lower compared to average children's friends' views of Liking ( $M = 3.25, SD = 0.54$ ),  $t_{(52.1)} = 2.50, p = .02, \eta^2 = .04$ <sup>63</sup>.

In sum, follow-up comparisons showed that Liking which represents an aspect of Intimacy showed the expected difference between rejected children's own views of Intimacy and the friends' views of Intimacy already at younger ages. In contrast, the present operationalization of Intimacy, which did not include Liking, showed the expected mean-level differences between rejected children and their friends only at older ages .

4.2.1.2.3 Number of mutual friendships. As detailed in Appendix K, popular children, on average, had a higher number of mutual friendships ( $\alpha (z = 8.30; se = .11) = 0.93$ ) compared to the average children. In contrast, the rejected children, on average, had lower numbers of mutual friendships than the average children ( $\alpha (z = -8.05; se = .11) = -0.91$ ). Thus, previous

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<sup>63</sup> I used the t-value which is based on separate estimates of the standard errors because the variances of average and rejected children's friends' views were not equal,  $F_{(45, 218)} = 2.72, p < .01$ .

findings (e.g., Brendgen et al., 2000) showing that the number of mutual friendships is related to children's sociometric status were replicated.

#### 4.2.1.3 Invariance of the Correlations of Agency and Means-ends Beliefs across Sociometric Groups of Friended and Friendless Children

This section presents the analyses testing the hypothesized invariance of the structural relations of agency and means-ends beliefs across sociometric groups of friended and friendless children.

4.2.1.3.1 Invariance of the correlational structures within belief systems. As shown in Table 10, the multivariate tests of invariance of the correlational structure of the three agency-belief dimensions (i.e., Self, Luck, and Adults) was significant on the set significance level (i.e.,  $p \leq .10$ , see Section 3.5.6) when compared with the metrically invariant model (see comparison of Model 1 versus Model 2). Relaxing the invariance constraint between agency beliefs about Self and Luck in the group of friendless-rejected children resulted in a highly significant increment in fit compared to the previous model (see comparison of Model 2 versus Model 2a) and a nonsignificant difference in fit when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

The latent correlation between agency beliefs about Self and Luck was significantly higher in the group of friendless-rejected children ( $r$  ( $z = 14.84$ ;  $se = .06$ ) = .86) than in the remaining groups of children ( $r$  ( $z = 12.36$ ;  $se = .04$ ) = .49). Across the five target groups agency beliefs about Self and agency beliefs about Adults were moderately highly correlated ( $r$  ( $z = 7.96$ ;  $se = .04$ ) = .34). Similarly, agency beliefs about external means (i.e., Luck and Adults) were invariantly moderately highly correlated ( $r$  ( $z = 7.14$ ;  $se = .05$ ) = .32).

The multivariate tests of invariance of the correlational structure of the means-ends beliefs did not result in a significant loss in fit when compared with the metrically invariant model (see comparison of Model 1 versus Model 2). Means-ends beliefs about Self were invariantly moderately highly correlated with means-ends beliefs about Luck ( $r$  ( $z = 10.41$ ;  $se = .05$ ) = .51). Means-ends beliefs about Self were invariantly lowly correlated with means-ends beliefs about Adults ( $r$  ( $z = 3.69$ ;  $se = .06$ ) = .21). Finally, means-ends beliefs about external means (i.e., Luck and Adults) were moderately highly intercorrelated ( $r$  ( $z = 4.86$ ;  $se = .06$ ) = .28).

Table 10  
*Testing Invariance of Latent Correlations of Agency and Means-ends Beliefs*

Metrically inv. (i.e., Baseline)		Test	$\Delta$					
$\chi^2$	df	Model Description	$\chi^2$	df	Comp.	$\Delta\chi^2$	df	p
Agency Beliefs								
1) 311.19	341a	2) All three correlations inv.	331.24	353	1 : 2	20.05	12	.07
		2a) Friendless-Rejected: Self - Luck free	319.45	352	1 : 2a 2 : 2a	8.26 11.79	11 1	.69 <.01
Means-ends Beliefs								
1) 289.65	341a	2) All three correlations inv.	299.89	353	1 : 2	10.24	12	.59
Agency Beliefs and Means-ends Beliefs								
1) 1266.41	1022a	2) Cross-belief correlations of <i>corresponding</i> dimensions inv.	1299.83	1034	1 : 2	33.42	12	<.01
		2a) Friendless-Rejected: Self, Luck free, Friendless-Rejected: Adults free	1277.07	1031	1 : 2a 2 : 2a	8.36 22.76	9 3	.30 <.01
		3) Cross-belief correlations of <i>noncorresponding</i> dimensions inv.	1292.48	1046	1 : 3	26.07	24	.35

*Note.* Comp. = Comparison, inv. = invariant, a = The here reported measurement invariant models gained 45 df by fixing the parameters of the measurement model.

4.2.1.3.2 Invariance of the correlational structure across belief systems. As shown in Table 10, the multivariate test of invariance of the correlations of agency and means-ends beliefs about corresponding causes (e.g., agency beliefs about the cause Self and means-ends beliefs about the cause Self) resulted in a significant decrement in fit when compared with the metrically invariant model, (see comparison of Model 1 versus Model 2), indicating that sociometric status and friendship status moderated these relationships. Relaxing the constraints of the correlation between agency and means-ends beliefs about Self and the correlation between agency and means-ends beliefs about Luck in the group of friendless-rejected children and relaxing the constraint of the correlation between agency and means-ends beliefs for Adults in the group of friendless-rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta\chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

As seen in Table 11, for the group of friendless-rejected children the correlation between agency and means-ends beliefs about Self was not reliably different from zero ( $t_z =$

1.27;  $se = .17$ ) = .22) while in the remaining groups of children beliefs about Self were highly correlated ( $r(z = 31.70; se = .03) = .80$ ). Similarly, in the group of friendless-rejected children the correlation between agency and means-ends beliefs about Luck was significantly lower and of moderate size ( $r(z = 3.21; se = .17) = .53$ ). In contrast, across the remaining groups of children these beliefs were invariantly highly correlated ( $r(z = 42.13; se = .02) = .90$ ). In the group of friended-rejected children the correlation of agency and means-ends beliefs about Adults was significantly lower ( $r(z = 6.56; se = .10) = .65$ ) than in the remaining groups of children ( $r(z = 32.09; se = .03) = .81$ ).

Table 11

*Correlations between Agency and Means-ends Beliefs across Sociometric Groups of Friended and Friendless Children*

Means-ends Beliefs		Agency Beliefs										
		Baseline (i.e., Friended-Average)			Different Estimate (Group)							
		$\underline{e}$	Self	Luck	Adults	Self	Luck	Adults				
Self	$\underline{r}$	<i>.80</i>	<i>(.03)</i>	.38	<i>(.05)</i>	.25	<i>(.05)</i>	.22	<i>(.17)</i>	(Friendless-Rejected)		
	$\underline{z}$	<i>21.70</i>		7.98		5.01		1.27				
Luck	$\underline{r}$	<i>.42</i>	<i>(.05)</i>	<i>.90</i>	<i>(.02)</i>	.24	<i>(.05)</i>		<i>.53</i>	<i>(.17)</i>	(Friendless-Rejected)	
	$\underline{z}$	<i>8.61</i>		<i>42.13</i>		4.47			<i>3.21</i>			
Adults	$\underline{r}$	<i>.16</i>	<i>(.05)</i>	.28	<i>(.05)</i>	<i>.81</i>	<i>(.03)</i>			(Friended-Rejected)	<i>.65</i>	<i>(.10)</i>
	$\underline{z}$	<i>3.16</i>		5.58		<i>32.09</i>					<i>6.56</i>	

*Note.*  $\underline{e}$  = estimate,  $\underline{r}$  = correlation,  $\underline{se}$  = standard error,  $\underline{z}$  = z-value. On the right side of the table estimates and groups are reported that differed significantly from the estimates in the group of friended-average children which represent the baseline group. Standard errors are reported in brackets. Italics denote correlations between agency and means-ends beliefs with corresponding means.

As shown in Table 10, the multivariate test of invariance of the correlations between agency and means-ends beliefs about noncorresponding causes (e.g., agency beliefs about the cause Self with means-ends beliefs about the cause Luck) resulted in a nonsignificant decrement in fit when compared with the metrically invariant model, (see comparison of Model 1 versus Model 2), indicating that sociometric status and friendship status did not moderate these relationships. As shown in 11, the range of the correlations between agency

and means-ends beliefs about noncorresponding causes was between  $\underline{r} = .16$  and  $\underline{r} = .42$  and the mean correlation was  $\underline{r} = .29$ .

#### 4.2.1.4 Summary of Additional Analyses: Invariance of the Correlational Structures of Action Strategies, Self-rated Friendship Quality Across Sociometric Groups of Friendled and Friendless Children and Invariance of the Correlations of Self-rated and Friend-rated Quality of Mutual Friendships

Appendix L describes the modeling procedures and results with regard to tests of invariance of the correlations of action strategies, self-rated friendship quality across sociometric groups of friendled and friendless children and invariance of the correlations of self-rated and friend-rated quality of mutual friendships.

4.2.1.4.1 Action strategies. As detailed in Appendix L, across the five target groups, the correlation between Direct Action and Seeking help invariantly was of moderate size ( $\underline{r} (z = 6.27; se = .07) = .43$ ). Across the groups, Direct Action and Action Omission invariantly were not reliably correlated ( $\underline{r} (z = -1.59; se = .07) = -.11$ ). In contrast, across all groups the strategy to omit action was highly related to the strategy to seek out help ( $\underline{r} (z = 10.75; se = .06) = .61$ ).

4.2.1.4.2 Self-rated Intimacy and Conflict. The correlation between Intimacy and Conflict was significantly higher in the group of friendless-rejected children ( $\underline{r} (z = 4.50; se = .16) = .70$ ) compared to both the group of popular children and friendled-rejected children ( $\underline{r} (z = 2.53; se = .10) = .25$ ) where this relationship was of equal size. Across both groups of average children the correlation between Intimacy and Conflict was of equal size and did not reliably differ from zero ( $\underline{r} (z = -1.59; se = .08) = -.13$ ).

4.2.1.4.3 Self-rated and friend-rated Intimacy and Conflict of mutual friendships. In general, with few minor differences, the present study replicated the findings of previous studies regarding children's mutual views of friendship quality (e.g., Brendgen et al., 2000). Average and popular children's perspectives on Intimacy correlated positively with their friends' perspectives on this positive friendship feature ( $\underline{r} (z = 5.78; se = .09) = .53$ ;  $\underline{r} (z = 3.74; se = .08) = .29$ , respectively) while rejected children's views of Intimacy were unrelated to their friends' views ( $\underline{r} (z = 0.52; se = .19) = .10$ ). However, the correlation between rejected children's self-rated and friend-rated Intimacy differed only significantly when compared with the corresponding correlation in the popular group but not when compared with the average

group. When interpreting the latter finding, it should be taken into account that the rather small size of the rejected group reduces the statistical power of the conducted cross-group comparisons.

The relationship between children's own views of Conflict and their friends' views of Conflict was moderately high and did not differ across sociometric groups ( $r(z = 6.20; se = .07) = .42$ ). When interpreting this finding it should be noted that the variability of both self-rated and friend-rated Conflict in the rejected group was larger compared to both the average and the popular group. Thus, the degree of correspondence of the friends' views of Conflict in the rejected group may be enhanced due to the higher variability compared to the average and popular groups.

Moreover, in the group of popular children friendship Intimacy and Conflict represented orthogonal dimensions of friendship quality ( $r(z = 0.50; se = .06) = .06$ ), while across the remaining groups of children (i.e., average and rejected children and average, popular, and rejected children's friends) Intimacy and Conflict were lowly and negatively correlated ( $r(z = -4.61; se = .05) = -.24$ ).

Finally, the results showed that the strength of the correlation between self-rated Intimacy and friend-rated Conflict did not differ from the strength of the correlation between self-rated Conflict and friend-rated Intimacy and the strength of these correlations was invariant across sociometric groups ( $r(z = -2.37; se = .05) = -.12$ ).

#### 4.2.1.5 Invariance of the Correlations of Agency and Means-ends Beliefs with Goal Difficulty across Sociometric Groups of Friended and Friendless Children

As depicted in Table 12, testing invariance of the correlations between the three agency beliefs and Goal Difficulty across the five target groups did not result in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2).

In contrast, testing invariance of the correlations between the means-ends beliefs and Goal Difficulty resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraints of the correlations between (a) means-ends beliefs about Self and Goal Difficulty in both groups of rejected children, (b) means-ends beliefs about Luck and Goal Difficulty in the friendless-

rejected group of children, and (c) means-ends beliefs about Adults in both groups (i.e., average and rejected) of friendless children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

Table 12  
*Testing Invariance of Latent Correlations of Agency and Means-ends Beliefs and Goal Difficulty across Sociometric Groups of Friendled and Friendless Children*

Metrically inv. (i.e., Baseline)		Test			$\Delta$				
$X^2$	df	Model Description	$X^2$	df	Comp.	$\Delta X^2$	df	p	
Agency Beliefs and Goal Difficulty									
1)	786.88	755	2) All dimensions with Difficulty	803.73	767	1 : 2	16.85	12	.16
Means-ends Beliefs and Goal Difficulty									
1)	779.97	755	2) All dimensions with Difficulty	810.03	767	1 : 2	30.06	12	<.01
			2a) Friendled-Rejected,	788.24	762	1 : 2a	8.27	7	.31
			Friendless-Rejected: Self free			2 : 2a	21.79	5	<.01
			Friendless-Rejected: Luck free						
			Friendless-Rejected,						
			Friendless-Average: Adults free						
			2b) Friendled-Rejected,	788.92	763	2a : 2b	0.68	1	.41
			Friendless-Rejected: Self inv.						
			2c) Friendless-Rejected,	788.59	763	2a : 2c	0.35	1	.55
			Friendless-Average: Adults inv.						

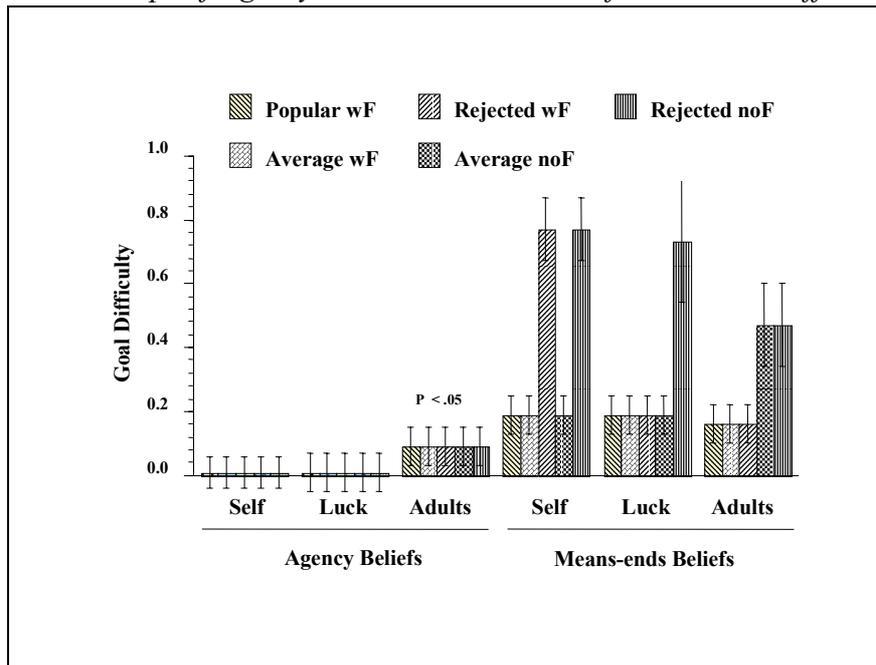
*Note.* Comp. = Comparison, inv. = invariant. By fixing the loadings of the measurement model the here reported measurement invariant models gained 105 df.

Equating the correlations of means-ends beliefs about Self and Goal Difficulty across both groups of rejected children did not result in a significant decrement in fit when compared to the previous model (see comparison of Model 2a versus Model 2b). Similarly, the correlation of means-ends beliefs about Adults and Difficulty did not differ across the groups of friendless-average and friendless-rejected children; the estimates in both groups could be forced to be equal without resulting in a significant loss in fit when compared to the previous model (see comparison of Model 2a versus Model 2c).

As depicted in Figure 10, agency beliefs were consistently not reliably correlated with Goal Difficulty ( $r(z = 0.17; se = .05) = .01$ ,  $r(z = 0.06; se = .06) = .00$ , and  $r(z = 1.67; se = .06) = .09$

for agency beliefs about Self, Luck, and Adults, respectively) while means-ends beliefs were lowly and positively correlated with Goal Difficulty ( $r$  ( $z = 3.01$ ;  $se = .06$ ) = .19,  $r$  ( $z = 2.94$ ;  $se = .06$ ) = .19, and  $r$  ( $z = 2.57$ ;  $se = .06$ ) = .16 for means-ends beliefs about Self, Luck, and Adults, respectively).

Figure 10  
*Relationships of Agency and Means-ends Beliefs with Goal Difficulty*



Note. wF = friended children, noF = friendless children

Importantly, for the groups of children with difficulties in their peer relationships some important significant differences in the correlational nexus between means-ends beliefs and Goal Difficulty evinced. Specifically, across the groups of both friended-rejected and friendless-rejected children means-ends beliefs about Self were invariantly highly correlated with Goal Difficulty ( $r$  ( $z = 7.80$ ;  $se = .10$ ) = .77). Across both groups of friendless children means-ends beliefs about Adults were invariantly moderately highly correlated with Goal Difficulty ( $r$  ( $z = 3.51$ ;  $se = .13$ ) = .47). Finally, in the friendless-rejected group means-ends beliefs about Luck were highly and positively correlated with Difficulty ( $r$  ( $z = 3.91$ ;  $se = .19$ ) = .73). Hence, in the friendless-rejected group all three dimensions of the means-ends beliefs were highly correlated with perceptions of Goal Difficulty.

For the groups of popular and friended-average children the correlations of the means-ends beliefs and Goal Difficulty, on average, were significantly higher than the correlations of

the agency beliefs and Goal Difficulty ( $z = 3.88, p < .01$ )<sup>64</sup>. This result replicates the findings of the developmental comparisons reported in Appendix G. These findings support the assumption that Goal Difficulty has more in common with means-ends beliefs than with agency beliefs.

#### 4.2.1.6 Invariance of the Correlations of Agency and Means-ends Beliefs with Action Strategies across Sociometric Groups of Friended and Friendless Children

As shown in Table 13, each of the conducted multivariate tests of cross-group invariance of the relationships of the three dimensions of agency beliefs and each of the action strategies resulted in a nonsignificant loss of fit indicating that the correlations did not differ across the five target groups.

Similarly, the multivariate test of cross-group invariance of the correlations of the three dimensions of means-ends beliefs and Direct Action resulted in a nonsignificant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2).

As shown in Figure 11, the patterns of relationships of the agency beliefs about Self and Luck with Direct Action as a strategy resembled the patterns of relationships of the corresponding means-ends beliefs with this strategy. Specifically, both agency and means-ends beliefs about Self were highly and positively correlated with Direct Action ( $r(z = 19.32; se = .04) = .70$ ;  $r(z = 15.09; se = .04) = .66$ , respectively) and these correlations were not significantly different ( $z = 5.30, p < .01$ ). In contrast, both agency and means-ends beliefs about Luck were moderately highly and positively correlated with this strategy ( $r(z = 6.06; se = .05) = .33$ ;  $r(z = 4.87; se = .06) = .31$ , respectively).

In contrast, the strengths of relationships of agency and means-ends beliefs about Adults with Direct Action differed significantly across belief types ( $z = 7.97, p < .01$ ). While the agency beliefs about Adults evinced a moderately high and positive correlation with Direct

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<sup>64</sup> The testing of differences in strengths among the correlated correlation coefficients was based on formulas 1 and 4 proposed by Meng et al., (1992).

Action ( $r(z = 5.40; se = .06) = .30$ ) the correlation between means-ends beliefs about Adults and this strategy did not significantly differ from zero ( $r(z = 1.75; se = .06) = .11$ ).

Table 13  
*Testing Invariance of Latent Correlations of Agency and Means-ends Beliefs and Action-Strategies across Sociometric Groups of Friended and Friendless Children*

Metrically inv. (i.e., Baseline)		Test			$\Delta$				
$\chi^2$	df	Model Description	$\chi^2$	df	Comp.	$\Delta\chi^2$	df	p	
Agency Beliefs and Action Strategies									
1)	1065.19	1022	2) All dimensions with Direct Action	1072.14	1034	1 : 2	6.95	12	.86
			3) All dimensions with Seek Help	1080.60	1034	1 : 3	15.41	12	.22
			4) All dimensions with Omission	1082.72	1034	1 : 4	17.53	12	.13
Means-ends Beliefs and Action Strategies									
1)	1068.82	1022	2) All dimensions with Direct Action	1072.38	1034	1 : 2	3.56	12	.99
			3) All dimensions with Seek Help	1094.91	1034	1 : 3	26.09	12	.01
			3a) Friended-Rejected: Self free	1080.17	1031	1 : 3a	11.35	9	.25
			Friendless-Rejected: Adults free			3 : 3a	13.82	3	<.01
			Friendless-Average: Adults free						
			3b) Friended-Rejected: Self free	1080.55	1032	3a : 3b	0.38	1	.54
			Friendless-Rejected,						
			Friendless-Average: Adults inv.						
			4) All dimensions with Omission	1093.99	1034	1 : 4	25.17	12	<.01
			4a) Friended-Rejected: Self free	1079.28	1032	1 : 4a	10.46	10	.40
			Friendless-Rejected: Adults free			4 : 4a	14.71	2	<.01

*Note.* Comp. = Comparison, inv. = invariant. By fixing the loadings of the measurement model the here reported measurement invariant models gained 126 df.

As seen in Table 13, the multivariate test of cross-group invariance of the correlations of the means-ends beliefs with Seeking Help as a strategy resulted in a significant decrement in fit when compared to the metrically invariant model (comparison of Model 1 vs. Model 3), indicating that sociometric status and friendship status moderated these relationships. Relaxing the constraints of the correlations between (a) means-ends beliefs about Self and Seeking Help in the group of friended-rejected children and (b) means-ends beliefs about Adults and Seeking Help in both groups of friendless children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 3 versus Model 3a), and a nonsignificant  $\Delta\chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 3a). Equating the correlations between

means-ends beliefs about Adults and Seeking Help across the groups of friendless-average and the friendless-rejected children did not result in a significant decrement in fit when compared to the previous model where these parameters were freely estimated (see comparison of Model 4a versus Model 4b).

As shown in Figure 11, across the two groups of friendless children means-ends beliefs about Adults and Seeking Help were invariantly highly and positively correlated ( $r(z = 6.52; se = .13) = .82$ ). In contrast, across the remaining groups of children this correlation was invariantly only of moderate size ( $r(z = 5.86; se = .07) = .39$ ). Hence, friendless children showed a stronger tendency to seek out help if they believed that help provided by adults represents a useful means for solving difficult situations in friendship relationships than friended children.

Moreover, the group of friended-rejected children showed a stronger tendency to seek out help if they believed that self-related means are useful for solving difficult situations in friendship relationships compared to the remaining groups of children. This was indicated by the significantly higher correlation between means-ends beliefs about Self and Seek Help ( $r(z = 6.16; se = .14) = .87$ ) compared to the remaining groups of children where this correlation was invariantly positive and of moderate size ( $r(z = 5.40; se = .07) = .36$ ).

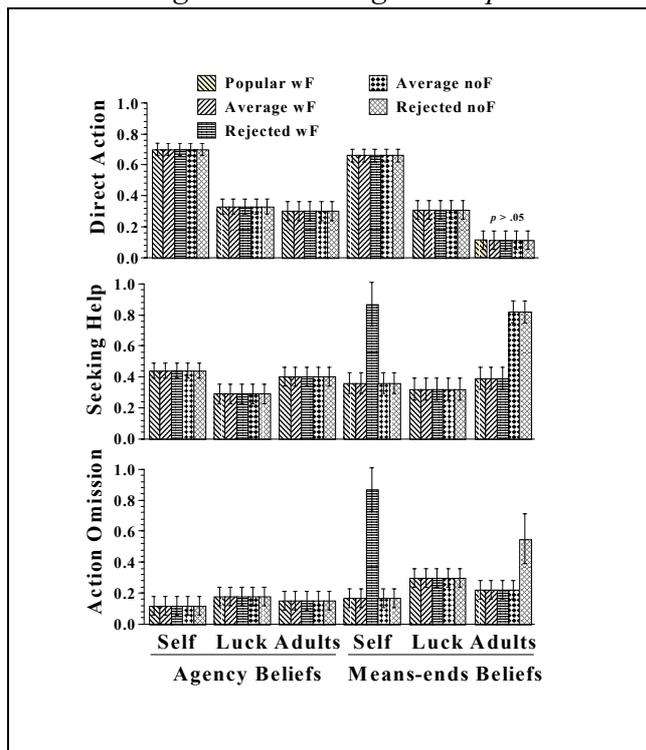
The correlations of all three means-ends beliefs and Seeking Help were invariant across the groups of friended-average and popular children. Across these groups the relationships of the means-ends beliefs with Seeking Help mirrored the relationships of the agency beliefs with this strategy.

In contrast to the age-group comparisons reported in Appendix G, where it has been found that for both the agency and means-ends beliefs the dimension Adults evinced higher relationships with Seeking Help than the dimensions Self and Luck, the present results showed that across the groups of friended-average and popular children the dimension Self was equally highly related to Seeking Help as was the dimension Adults for both the agency and means-ends beliefs ( $z = 0.83, p > .20$  and  $z = -0.58, p > .20$ , respectively).

Both agency and means-ends beliefs about Luck were invariantly moderately highly and positively correlated with Seeking Help ( $r(z = 4.77; se = .06) = .29$  and  $r(z = 4.64; se = .04) = .32$ , respectively) across the five target groups. Across all groups, the correlation of agency beliefs about Luck and Seeking Help was significantly lower than the correlations of both agency

beliefs about Adults and Self with this strategy ( $\underline{z} = 2.98, p < .01$ )<sup>65</sup>. Across the groups of friended-average and popular children the correlation between means-ends beliefs about Luck and Seeking Help did not significantly differ from the correlations of both means-ends beliefs about Adults and Self with this strategy ( $\underline{z} = 1.21, p > .20$ ).

Figure 11  
*Relationships of Agency and Means-Ends Beliefs with Action Strategies across Target Groups*



Note. wF = friended children, noF = friendless children

As depicted in Table 13, the model specifying invariance of the correlations between the means-ends beliefs and Action Omission across the target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 4). Relaxing the constraints of the correlations between (a) means-ends beliefs about Self and Action Omission in the group of friended-rejected children and (b) means-ends beliefs about Adults and Action Omission in the group of friendless-rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of

<sup>65</sup> The testing of contrasts among the correlated correlation coefficients was based on formula 8 proposed by Meng, Rosenthal, and Rubin (1992).

Model 4 versus Model 4a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 4a).

As depicted in Figure 11, in the group of friended-rejected children means-ends beliefs about Self and Action Omission were highly and positively correlated ( $r$  ( $z = 6.05$ ;  $se = .14$ ) = .87) while across the remaining groups the corresponding belief-strategy correlations were invariantly only low ( $r$  ( $z = 2.75$ ;  $se = .06$ ) = .17).

Moreover, in the friendless-rejected group of children means-ends beliefs about Adults and Action Omission were moderately highly and positively correlated ( $r$  ( $z = 3.42$ ;  $se = .16$ ) = .55) while across the remaining groups means-ends beliefs about Adults and Action Omission invariantly were only lowly correlated ( $r$  ( $z = 3.53$ ;  $se = .06$ ) = .22). Across the five target groups means-ends beliefs about Luck invariantly evinced a moderate high and positive correlation with Action Omission ( $r$  ( $z = 5.02$ ;  $se = .06$ ) = .30).

#### 4.2.1.7 Invariance of the Correlations of Action Strategies and Goal Difficulty across Sociometric Groups of Friended and Friendless Children

As seen in Table 14, the multivariate test of invariance of the correlations among action strategies with Goal Difficulty across the target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraints of the correlations of Goal Difficulty with (a) Seeking Help in the group of friended-rejected children and the group of friendless-average children and (b) Action Omission in both groups of rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

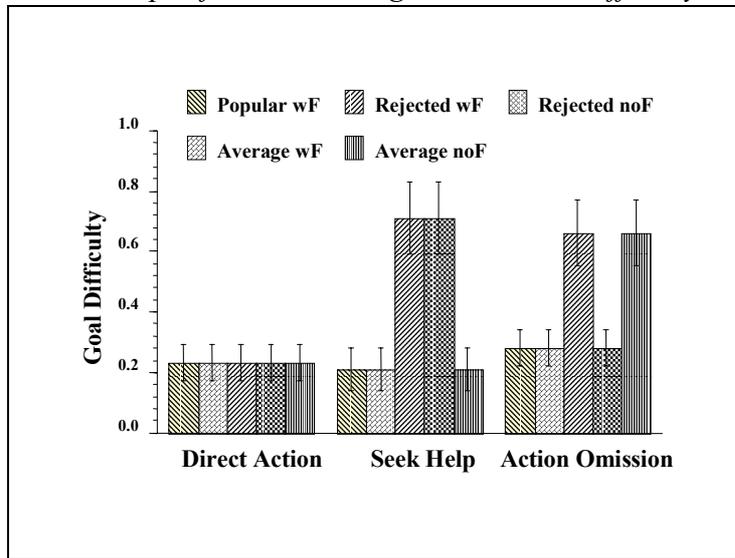
Table 14  
*Testing Invariance of Latent Correlations of Action Strategies and Goal Difficulty across Sociometric Groups of Friended and Friendless Children*

Metrically inv. (i.e., Baseline)		Test			Δ			
<b>X<sup>2</sup></b>	<b>df</b>	Model Description	<b>X<sup>2</sup></b>	<b>df</b>	Comp.	<b>ΔX<sup>2</sup></b>	<b>df</b>	<b>p</b>
Action Strategies and Goal Difficulty								
1)	801.93	755	2) All strategies with Difficulty	824.69	767	1 : 2	22.76	12 .03
			2a) Friended-Rejected,	806.96	763	1 : 2a	5.03	8 .75
			Friendless-Average: Seek Help free			2 : 2a	17.73	4 <.01
			Friended-Rejected,					
			Friendless-Rejected: Omission free					
			2b) Friended-Rejected,	807.91	764	2a : 2b	0.95	1 .33
			Friendless-Average: Seek Help inv.					
			Friended-Rejected,					
			Friendless-Rejected: Omission free					
			2c) Friended-Rejected,	807.13	764	2a : 2c	0.17	1 .68
			Friendless-Average: Seek Help free					
			Friended-Rejected,					
			Friendless-Rejected: Omission inv.					

*Note.* Comp. = Comparison, inv. = invariant. By fixing the loadings of the measurement model the here reported measurement invariant models gained 105 df.

As seen in Figure 12, across the target groups Direct Action was invariantly lowly and positively correlated with Goal Difficulty ( $\underline{r}$  ( $z = 3.73$ ;  $se = .06$ ) = .23). Across the groups of popular and friended-average children and the group of friendless-rejected children Seeking Help and Goal Difficulty were lowly and positively correlated ( $\underline{r}$  ( $z = 2.80$ ;  $se = .07$ ) = .21). Across the groups of friended-rejected children and the group of friendless-average children Seeking Help and Goal Difficulty were invariantly highly and positively correlated ( $\underline{r}$  ( $z = 6.05$ ;  $se = .12$ ) = .71). Across the three groups (i.e., popular, average, and rejected) of friended children Action Omission and Goal Difficulty invariantly were lowly and positively correlated ( $\underline{r}$  ( $z = 4.51$ ;  $se = .06$ ) = .28). In contrast, across both groups of rejected children Action Omission and Goal Difficulty were invariantly highly and positively correlated ( $\underline{r}$  ( $z = 6.11$ ;  $se = .11$ ) = .66). Notably, friended-rejected children who evaluated friendship goals as being difficult tended to implement both action omission and seeking help as strategies to cope with difficult situations. In contrast, friendless-rejected children who evaluated friendship goals as being difficult tended to cope with difficult situations mainly by omitting actions.

Figure 12

*Relationships of Action Strategies and Goal Difficulty*

Note. wF = friended children, noF = friendless children

#### 4.2.1.8 Invariance of the Correlations of Perceived Control (i.e., Agency and Means-ends Beliefs, and Goal Difficulty), and Action Strategies with Self-rated Friendship Quality across Sociometric Groups of Friended and Friendless Children

4.2.1.8.1 Agency and means-ends beliefs. As shown in Table 15, testing invariance of the relationships of self-rated Intimacy and Conflict with agency beliefs about Self (Model 2), and agency beliefs about Luck (Model 3) across groups resulted in a nonsignificant decrement in fit when compared to the metrically invariant model (Model 1).

As depicted in Figure 13, across all target groups agency beliefs about Self evinced a moderately high and positive correlation with Intimacy ( $\underline{r}(z = 9.75; se = .04) = .42$ ) while its correlation with Conflict was not significantly different from zero ( $\underline{r}(z = -1.75; se = .06) = -.10$ ). Agency beliefs about Luck invariantly evinced a low and positive correlation with Intimacy

( $r$  ( $z = 3.22$ ;  $se = .05$ ) = .16) while its correlation with Conflict also was not significantly different from zero ( $r$  ( $z = -0.84$ ;  $se = .05$ ) = -.05).

Testing cross-group invariance of the correlations of agency beliefs about Adults and both aspects of friendship quality resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 4). Relaxing the constrained correlations among agency beliefs about Adults with both Conflict and Intimacy for the group of friendless-rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 4 versus Model 4a), and a nonsignificant  $\Delta \chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 4a).

As seen in Figure 13, while in the group of friendless-rejected children agency beliefs about Adults evinced a high and positive relationship with Intimacy ( $r$  ( $z = 5.10$ ;  $se = .14$ ) = .70) in the remaining groups this correlation was only low ( $r$  ( $z = 3.46$ ;  $se = .05$ ) = .18). Moreover, in the group of friendless-rejected children agency beliefs about Adults were moderately highly and positively correlated with Conflict perceptions ( $r$  ( $z = 3.09$ ;  $se = .16$ ) = .50) while in the remaining groups these beliefs were invariantly not reliably correlated with Conflict ( $r$  ( $z = -0.55$ ;  $se = .06$ ) = -.03).

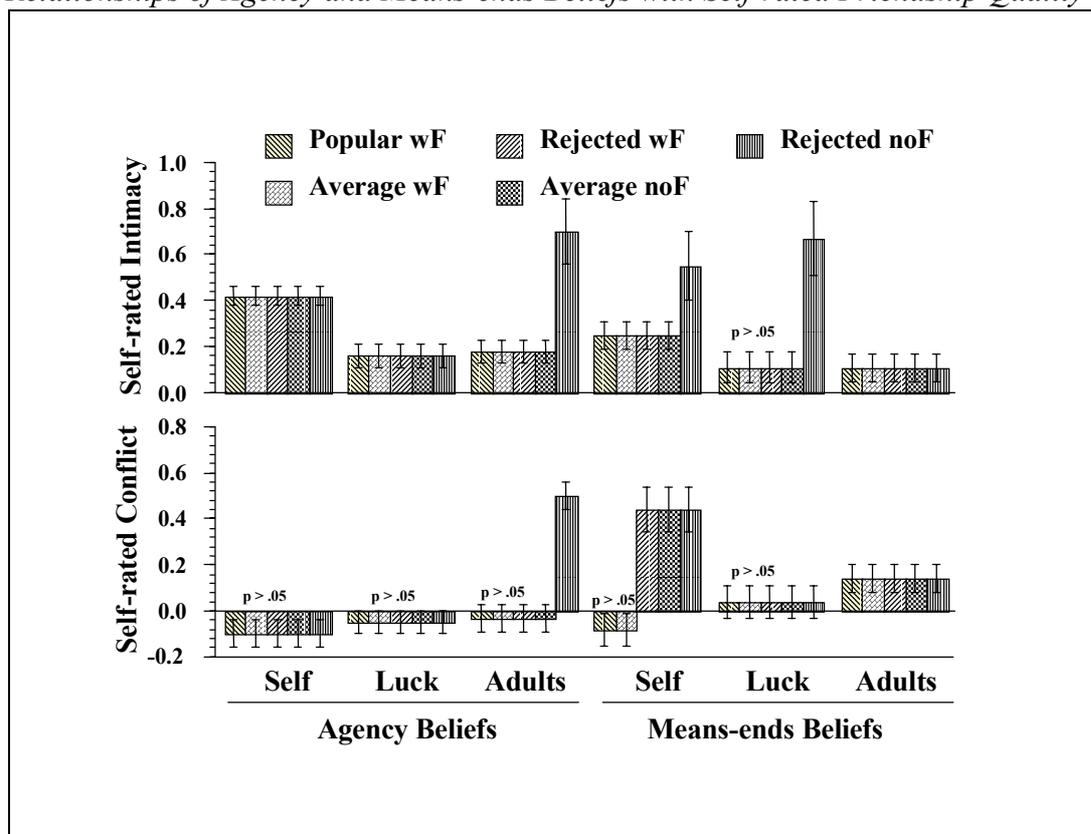
As seen in Table 15, testing invariance of the correlations of means-ends beliefs about Self and friendship quality across target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraints of the correlations of means-ends beliefs about Self and (a) Intimacy for the group of friendless-rejected children, and (b) Conflict for both groups of rejected children and the friendless-average group of children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta \chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

As shown in Figure 13, means-ends beliefs about Self were invariantly lowly and positively correlated with Intimacy ( $r$  ( $z = 4.48$ ;  $se = .06$ ) = .25). The exception was that these beliefs were moderately highly and positively correlated with Intimacy ( $r$  ( $z = 3.75$ ;  $se = .15$ ) =

.55) in the group of friendless-rejected children. However, in the group of friendless-rejected children the correlation of agency beliefs about Self and Intimacy was not significantly different from the correlation of means-ends beliefs about Self and Intimacy ( $\underline{z} = 0.75, p > .20$ ).

Moreover, means-ends beliefs about Self were invariantly not reliably correlated with Conflict ( $\underline{r} (z = -1.08; se = .07) = -.08$ ) across the popular and friended-average groups of children. In contrast, in the groups with difficulties in their peer relations (i.e., friended-rejected children, friendless-rejected children, and friendless-average children) means-ends beliefs about Self were moderately highly and positively correlated with Conflict ( $\underline{r} (z = 4.45; se = .10) = .44$ ).

Figure 13  
*Relationships of Agency and Means-ends Beliefs with Self-rated Friendship Quality*



As seen in Table 15, testing invariance of the correlations of means-ends beliefs about Luck and friendship quality across the target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 3).

Relaxing the constraints of the correlation between means-ends beliefs about Luck and Intimacy in the group of friendless-rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 3 versus Model 3a), and a nonsignificant  $\Delta \chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 3a).

As seen in Figure 13, means-ends beliefs about Luck invariantly were not reliably correlated with both Intimacy ( $r(z = 1.85; se = .07) = .11$ ) and Conflict ( $r(z = 0.67; se = .07) = .04$ ). The exception was the high and positive relationship of means-ends beliefs about Luck and Intimacy in the group of friendless-rejected children ( $r(z = 4.00; se = .16) = .67$ ).

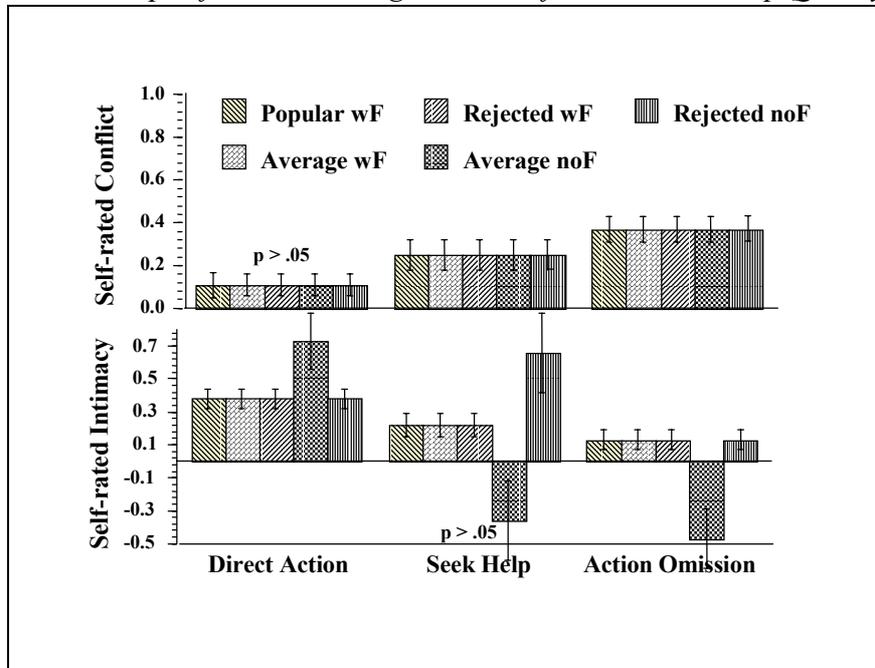
As seen in Table 15, testing invariance of the correlations of means-ends beliefs about Adults and friendship quality across the target groups did not reveal a significant difference (see comparison of Model 1 vs. Model 4). As depicted in Figure 13, means-ends beliefs about Adults evinced low and positive relationships with both Intimacy and Conflict ( $r(z = 2.06; se = .06) = .11$  and  $r(z = 2.29; se = .06) = .14$ , respectively).

4.2.1.8.2 Goal Difficulty. As shown in Table 15, testing invariance of the correlations of Goal Difficulty with friendship quality across the target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraint of the correlation between Difficulty and Intimacy in the group of friended-average children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta \chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

While in the group of friended-average children Goal Difficulty was unrelated to perceptions of Intimacy ( $r(z = -0.92; se = .08) = -.08$ ) across the remaining groups Goal Difficulty was invariantly moderately highly and positively correlated with self-rated Intimacy ( $r(z = 4.83; se = .07) = .35$ ). Thus, with the exception of friended-average children, children who perceived that positive friendship outcomes are difficult to attain tended to evaluate their positive friendship aspects more highly than children who perceived that positive friendship

outcomes are easy to attain. Moreover, Goal Difficulty invariantly evinced a low and positive correlation with Conflict ( $r(z = 3.13; se = .06) = .19$ ).

Figure 14  
*Relationships of Action Strategies and Self-rated Friendship Quality*



4.2.1.8.3 Action strategies. As seen in Table 15, testing invariance of the correlations of the three types of action strategies with self-rated Intimacy across the target groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraints of the correlations between Intimacy and (a) Seeking Help in the group of friendless-rejected children and (b) all three action strategies in the group of friendless-average children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

As seen in Figure 14, for the group of friendless-average children Direct Action evinced a positive and high correlation with Intimacy ( $r(z = 4.50; se = .17) = .73$ ) while this strategy was invariantly only moderately highly and positively correlated with Intimacy across the remaining groups of children ( $r(z = 6.54; se = .06) = .38$ ). Furthermore, in the group of friendless-average children both Action Omission and Seeking Help evinced moderately high

and negative correlations with Intimacy ( $r(z = -2.65; se = .18) = -.47$  and  $r(z = -1.51; se = .24) = -.36$  for Action Omission and Seeking Help, respectively), although the correlation of Seeking Help and Intimacy failed to reach conventional levels of significance. In contrast and contrary to the hypotheses, across the remaining groups of children both Action Omission and Seeking Help were lowly and positively correlated with Intimacy ( $r(z = 3.19; se = .07) = .22$  and  $r(z = 2.05; se = .06) = .13$  for Action Omission and Seeking Help, respectively). The exception was the high and positive correlation between Seeking Help and Intimacy in the group of friendless-rejected children ( $r(z = 2.77; se = .24) = .66$ ).

As shown in Table 15, testing invariance of the correlations of the three types of action strategies with Conflict across the target groups resulted in a negligible decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 3). Across all target groups the correlation between Direct Action and Conflict invariantly was not different from zero ( $r(z = 1.58; se = .05) = .11$ ). In contrast, Seeking Help and Conflict were invariantly lowly and positively correlated ( $r(z = 3.49; se = .07) = .25$ ). Moreover, children's tendencies to omit actions were moderately highly and positively correlated with the amount of perceived Conflict ( $r(z = 6.29; se = .07) = .37$ ).

Table 15

*Testing Invariance of Latent Correlations of Agency and Means-ends Beliefs, Action-Strategies, Goal Difficulty and Self-rated Friendship Quality across Sociometric Groups of Friendled and Friendless Children*

Metrically inv. (i.e., Baseline)		Test				$\Delta$		
$X^2$	df	Model Description	$X^2$	df	Comp.	$\Delta X^2$	df	p
Agency Beliefs and Self-rated Friendship Quality								
1)	1139.29	1022a	2) Self with Intimacy and Conflict	1148.35	1030	1 : 2	9.06	8 .34
			3) Luck with Intimacy and Conflict	1151.66	1030	1 : 3	12.37	8 .14
			4) Adults with Intimacy and Conflict	1156.77	1030	1 : 4	17.48	8 .03
			4a) Friendless-Rejected: Adults-Conflict, Adults-Intimacy free	1146.33	1028	1 : 4a 4 : 4a	7.04 10.44	6 .32 2 <.01
Means-ends Beliefs and Self-rated Friendship Quality								
1)	1139.29	1022a	2) Self with Intimacy and Conflict	1175.58	1030	1 : 2	18.90	8 .02
			2a) Friendless-Rejected: Self-Intimacy, Self-Conflict free	1159.33	1026	1 : 2a 2 : 2a	1.94 16.25	4 .75 4 <.01
			Friendled-Rejected: Self-Conflict free Friendless-Average: Self-Conflict free					
			2b) Friendless-Rejected: Self-Intimacy free Friendless-Rejected, Friendled-Rejected, Friendless-Average: Self-Conflict inv.	1159.79	1028	2a : 2b	0.46	2 .79
			3) Luck with Intimacy and Conflict	1171.49	1030	1 : 3	14.10	8 .08
			3a) Friendless-Rejected: Luck-Intimacy free	1165.32	1029	1 : 3a 3 : 3a	7.93 6.17	7 .34 1 .01
			4) Adults with Intimacy and Conflict	1169.69	1030	1 : 4	12.30	8 .14
Goal Difficulty and Self-rated Friendship Quality								
1)	1139.29	1022a	2) Difficulty with Intimacy and Conflict	1173.53	1030	1 : 2	16.04	8 .04
			2a) Friendled-Average: Difficulty-Intimacy free	1159.29	1029	1 : 2a 2 : 2a	1.90 14.24	7 .97 1 <.01
Action Strategies and Self-rated Friendship Quality (i.e., Intimacy and Conflict)								
1)	798.37	755b	2) All strategies with Intimacy	823.17	767	1 : 2	24.80	12 .02
			2a) Friendless-Average: Direct Action, Seek Help, Action Omission free	808.01	763	1 : 2a 2 : 2a	9.64 15.16	8 .29 4 <.01
			Friendless-Rejected: Seek Help free					
			3) All strategies with Conflict	812.49	767	1 : 3	14.12	12 .29

*Note.* Comp. = Comparison, inv. = invariant. By fixing the loadings of the measurement model the here reported measurement invariant models gained a = 126 df and b = 105 df.

#### 4.2.1.9 Additional Analyses: Investigating the Interplay of Agency and Means-ends Beliefs in the Prediction of Action Strategies and Self-rated Friendship Quality across Sociometric Groups of Friendled and Friendless Children

As outlined in Section 2.2.1.8, it has been proposed that the subtractive (see Heider, 1958) or multiplicative (see, e.g., Skinner, 1995; Weisz, 1983) relationships between agency beliefs and means-ends beliefs may affect action. Moreover, the rather high relationships

between agency and means-ends beliefs (i.e., low degree of differentiation among belief types) suggest that agency and means-ends beliefs share variance when predicting Goal Difficulty, action strategies, and friendship outcomes.

In order to investigate the interplay of agency and means-ends beliefs in the prediction of Goal Difficulty, action strategies and friendship outcomes, I conducted hierarchical multiple regression analyses (e.g., Aiken & West, 1991). In a first step, I entered gender and grade in order to control for their effects. In a second step, I entered agency and means-ends beliefs about one of the specific means, dummy-coded sociometric status (i.e., popular children vs. average children and rejected children vs. average children), and dummy-coded friendship participation (i.e., friended vs. friendless children) followed by interaction terms. Because there were no friendless-popular children I did not include interaction terms referring to this group. Table M1 in Appendix M shows the *t*-values of agency and means-ends beliefs and the significant terms of this model. As seen in the table, in part, the results of this analysis of the raw data replicated the results of the SEM analyses. Differences across the analyses may mainly be accounted by differences in power of the two methods and shared variances of the predictors. For example, after including the interaction terms, the regression weights of agency and means-ends beliefs were rather low and, in part, not significant.

However, most of the interaction effects which were significant in the SEM analyses were also significant in the multiple regression analysis. For example, the significant three-way interaction of rejected peer status vs. average peer status \* friended vs. friendless \* means-ends beliefs about Self ( $t = 2.01$ ) was in line with the finding of the SEM analyses that the relationship of means-ends beliefs about Self and Action Omission was significantly higher for friended-rejected children compared to the remaining groups. However, the multiple regression analyses indicated that there was a similar three-way interaction for agency beliefs about Self ( $t = 2.17$ ). Follow-up comparisons of the partial relationships of agency and means-ends beliefs about Self showed that for rejected children the partial relationships of both agency and means-ends beliefs with Action Omission were reliable ( $t = -2.03$  and  $t = 4.06$ , respectively) while these relationships were unreliable across the remaining groups. Importantly, when controlling for the effects of the corresponding means-ends beliefs,

for the group of friended-rejected children the partial relationship of agency beliefs about Self and Action Omission was negatively directed. Thus, friended-rejected children did not omit action if they felt that they have more self-related means available than they needed.

The results of the overall regression models showed that only one of the two-way interactions of agency and means-ends beliefs for the various dependent variables was significant. Specifically, agency and means-ends beliefs about Luck interacted significantly and negatively when predicting Action Omission ( $t = -3.07$ ). As indicated by the negatively directed interaction term, the positive relationship between means-ends beliefs about Luck and Action Omission was lower for children with high levels of agency beliefs about Luck ( $\beta = 0.23, t = 1.99$ ) compared to children with low levels of agency beliefs about this means ( $\beta = 0.58, t = 2.61$ ). Thus, for children who believed that they lack access to luck, beliefs about the usefulness of luck were related to passive behaviors. Conversely, compared to the previous children, children who believed to be lucky, beliefs about the usefulness of luck were less likely to lead to passive behaviors.

The results of these overall regression models replicated the finding of the SEM analyses that both sociometric status and friendship participation did not moderate the relationships of self-related beliefs and Direct Action. Importantly, when controlling for the effects of their corresponding agency beliefs, the partial relationships of means-ends beliefs about Self and Direct Action dropped substantially while the corresponding zero-order correlations mirrored the relationships of agency beliefs. Specifically, while agency beliefs about Self remained significantly and positively related to Direct Action ( $\beta = .39, t = 2.20$ ), the corresponding partial relationship of means-ends beliefs about Self and Direct Action was nonsignificant ( $\beta = .23, t = 1.34$ ). In contrast, when controlling only for age and gender the standardized regression coefficient of means-ends beliefs about Self was highly significant ( $\beta = .49, t = 11.88$ ). These findings provide support for a subtractive relationship of agency and means-ends beliefs.

#### 4.2.2 Correlations of Perceived Control, Action Strategies and Number of Mutual Friendships

As shown in Table 16, each of the models testing invariance of the correlations of the number of mutual friendships, agency and means-ends beliefs, and action strategies across

sociometric groups (which combined friended and friendless children), resulted in a nonsignificant loss in fit when compared to the respective metrically invariant model. Hence, the relationships of each of these target constructs with the number of mutual friendships were invariant across sociometric groups.

Table 16

*Testing Invariance of the Latent Correlations of Agency and Means-ends Beliefs, Action-Strategies, Goal Difficulty and the Number of Mutual Friendships across Sociometric Groups*

Metrically inv. (i.e., Baseline)		Test				$\Delta$		
$\chi^2$	df	Model Description	$\chi^2$	df	Comp.	$\Delta\chi^2$	df	p
Agency Beliefs and Number of Mutual Friendships								
1) 285.66	272a	2) Agency Beliefs inv.	294.47	278	1 : 2	8.81	6	.18
Means-ends Beliefs and Number of Mutual Friendships								
1) 282.30	272a	2) Means-ends Beliefs inv.	288.52	248	1 : 2	6.22	6	.40
Goal Difficulty and Number of Mutual Friendships								
1) 282.30	272a	2) Goal Difficulty inv.	287.77	273	1 : 2	5.47	2	.06
		2a) popular free	282.37	273	1 : 2a	0.07	1	.79
					2 : 2a	5.40	1	.02
Action Strategies and Number of Mutual Friendships								
1) 172.84	227b	2) Action Strategies	177.68	233	1 : 2	4.84	6	.56

*Note.* Comp. = Comparison, inv. = invariant. The degrees of freedom of the here reported measurement invariant models differ from the degrees of freedom of the measurement invariant models reported in Table I3 in Appendix I. By fixing the loadings and intercepts of the measurement model the here reported models gained a = 13 df and b = 47 df.

In contrast, the model testing invariance of the correlation of Goal Difficulty and the number of mutual friendships resulted in significant loss in fit when compared to the respective metrically invariant model, although the  $\Delta\chi^2$  value of the model was only marginally significant ( $p = .06$ ). Relaxing the constrained correlation of Goal Difficulty with friendship quantity in the popular group resulted in a significant increment in fit compared to the previous model. Moreover, comparing the model with the relaxed constraint with the metrically invariant model showed that the fit of the two models was not significantly different.

As shown in Table N1 in Appendix N, contrary to the hypotheses, across sociometric groups agency and means-ends beliefs, and action strategies did not evince significant relationships with the number of mutual friendships. Thus, the correlations, replicated the

findings of the mean-level comparisons, showing a general lack of relationships between beliefs and friendship participation. However, the finding that friendless-average children had higher means-ends beliefs about Adults than the remaining groups did not replicate in the present analyses. The rather small number of friendless children which were combined with a large number of friended-average children may explain why the relationship between means-ends beliefs about Adults and the number of mutual friendships did not reach significant levels for the group of average children.

Goal Difficulty was lowly and negatively correlated with friendship quantity in the group of popular children ( $r$  ( $z = -2.87$ ;  $se = .10$ ) =  $-.29$ ) while it was invariantly uncorrelated with friendship quantity across the groups of average and rejected children  $r$  ( $z = -0.04$ ;  $se = .06$ ) =  $.00$ ). Hence, although only marginally significant, the empirical rank ordering according to the strengths of correlations was reversed compared to the hypothesized rank ordering. Thus, this result does not support the hypothesized moderating effect of sociometric status on the relationship between Goal Difficulty and number of mutual friendships.

#### 4.2.2.1 Additional Analyses: Does Sociometric Status, as a Third Variable, Explain the Relationships of External Means-ends Beliefs and Goal Difficulty with the Number of Mutual Friendships which were Invariantly Found Across Grade Levels?

The previous sections have shown that when partialling the effects of sociometric status the relationships of both external means-ends beliefs and Goal Difficulty and the number of mutual friendships were unreliable (with a single exception). In contrast, these constructs invariantly evinced, as hypothesized, negative relationships with the number of mutual friendships across age groups (see Appendix G, and Section 4.1.1.2, for a summary). Taken together with the findings that (a) mean-level differences in external means-ends beliefs and Goal Difficulty and (b) the number of mutual friendships were associated with sociometric status the findings suggest that sociometric status, as a third variable, may have caused the relationships of these beliefs and the number of mutual friendships which were found in the cross-sectional age comparisons.

In fact, a posteriori conducted hierarchical regression analyses on the raw data showed that when controlling for the effects of sociometric status these variables explained no

significant amounts of unique variance of the number of mutual friendships, although, when controlling for the effects of gender, the partial raw correlations were significant and similar to the latent correlations ( $\underline{r} = -.10$ ,  $\underline{r} = -.08$ , and  $\underline{r} = -.09$ ; for Goal Difficulty, means-ends beliefs about Luck and Adults, respectively). For each of these beliefs I calculated a hierarchical regression on the overall group. Collapsing the sample across age groups was justified because the relationships have been found to be age-invariant. In a first step, I entered Gender, followed by the respective beliefs. As a third step, I entered dummy-coded sociometric status with the average group as a comparison group. The contribution of each of the two dummy variables was significant across all models. In contrast, Gender had no influence on these relationships.

#### 4.2.3 Correlations of Perceived Control, Action Strategies and Friend-rated Friendship Quality

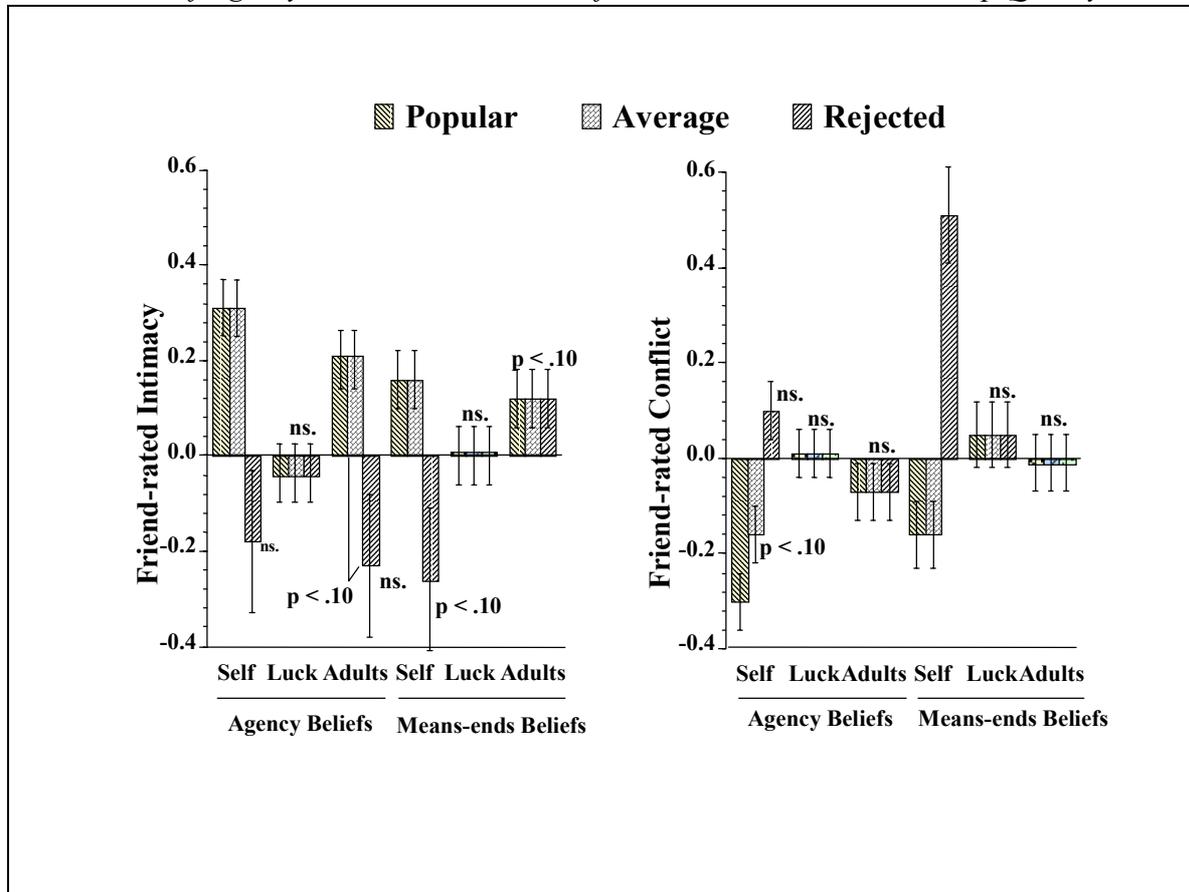
##### 4.2.3.1 Agency Beliefs and Friend-rated Friendships Quality

As shown in Table 17, testing invariance of the correlations of friend-rated Friendship Intimacy and all dimensions of agency beliefs (Model 2), resulted in a significant loss in fit when compared to the metrically invariant model (Model 1). Relaxing the constrained correlations of agency beliefs about Self and friend-rated Intimacy in the group of rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a). However, when compared with the metrically invariant model the  $\Delta \chi^2$  value was still significant which indicated that there was, at least, one further estimate which was not invariant (see comparison of Model 1 versus Model 2a).

Relaxing the constrained correlations of agency beliefs about Adults and friend-rated Intimacy in the group of rejected children resulted only in a marginally significant increment in fit when compared to the Model 2 (see comparison of Model 2 versus Model 3a) and, as it was the case for the previous model, in a significant  $\Delta \chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 3a). However, the model in which both correlations were freely estimated resulted in a significant increment in fit when compared to Model 2 (see comparison of Model 2 versus Model 4a) and in a nonsignificant

$\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 4a).

Figure 15  
*Correlations of Agency and Means-ends Beliefs and Friend-rated Friendship Quality*



Note. With the exception of the correlations of agency beliefs about Self and friend-rated Conflict, the constrained correlations are depicted across groups. The multivariate test of cross-group differences in the correlations of all agency beliefs and friend-rated Conflict was not significant; thus, the test did not indicate that the unconstrained correlations of agency beliefs about Self and friend-rated Conflict differ across groups. ns = the correlation was not significantly different from zero.

As depicted in Figure 15, rejected children's agency beliefs about Self were not reliably correlated with the friends' views of Intimacy ( $r(z = -1.37; se = .13) = -.18$ ). In contrast, across the groups of average and popular children agency beliefs about Self were invariably moderately highly and positively correlated with the friends' views of Intimacy ( $r(z = 5.51; se = .06) = .31$ ). Similarly, while in the group of rejected children agency beliefs about Adults did not evince a reliable correlation with friend-rated Intimacy ( $r(z = 1.26; se = .15) = -.23$ ), across the groups of average and popular children these beliefs were lowly and positively correlated with the friends' ratings of Intimacy ( $r(z = 3.49; se = .06) = .21$ ). However, the cross-group difference in these correlations was only marginally significant. Finally, across all three

groups agency beliefs about Luck were not reliably correlated with the friends' views of Intimacy ( $\underline{r}$  ( $z = -0.64$ ;  $se = .06$ ) =  $-.04$ ).

The multivariate test of invariance of the correlations of Friendship Conflict with all dimensions of the agency beliefs (Model 2), resulted in a nonsignificant loss in fit when compared to the metrically invariant model (Model 1). Although the multivariate test lacked the statistical power to detect significant differences in the correlations of agency beliefs about Self and friend-rated Conflict across groups, I conducted two follow-up single comparisons in order to test the hypothesized moderating effects of sociometric status on the relationship of agency beliefs about Self and friend-rated Conflict. The apriori hypotheses were (a) that agency beliefs would be positively related to friend-rated Conflict across the popular and average groups while this relationship would be negatively directed in the rejected group and (b) that the relationships of self-rated agency beliefs and friendship outcomes would be higher compared to agency beliefs about external means. The follow-up tests showed that the correlation of agency beliefs about Self and friend-rated Conflict was significantly different across the rejected and the popular group (i.e.,  $\Delta \chi^2_{(1)} = 3.41$ ,  $p < .05$ , one-tailed test) while it was only marginally significant across the rejected and average group (i.e.,  $\Delta \chi^2_{(1)} = 1.66$ ,  $p < .10$ , one-tailed test).

As depicted in Figure 15, both agency beliefs about Luck and Adults were invariantly not significantly related to friend-rated Conflict ( $\underline{r}$  ( $z = 0.10$ ;  $se = .07$ ) =  $.01$  and  $\underline{r}$  ( $z = -1.08$ ;  $se = .06$ ) =  $-.07$  for agency beliefs about Luck and Adults, respectively). The figure shows the unconstrained correlations of agency beliefs about Self and friend-rated Conflict. In the rejected group the unconstrained correlation between agency beliefs about Self and friend-rated Conflict was not reliably different from zero ( $\underline{r}$  ( $z = 0.55$ ;  $se = .17$ ) =  $.10$ ). In contrast, in the popular group this correlation was significant different from zero and, as hypothesized, negatively directed ( $\underline{r}$  ( $z = -2.70$ ;  $se = .11$ ) =  $-.30$ ). Similarly, in the average group this correlation was negatively directed, although it was only marginally significant from zero ( $\underline{r}$  ( $z = -1.89$ ;  $se = .08$ ) =  $-.16$ ). Thus, although not significant, the cross-group differences in the correlations of agency beliefs about Self and friend-rated Conflict provide some evidence for the assumption

that for the rejected group agency beliefs about Self are not related to decreases in friends' perceptions of conflict.

#### 4.2.3.2 Means-ends Beliefs and Friend-rated Friendships Quality

As seen in Table 17, testing invariance of the correlations of all three dimensions of the means-ends beliefs and friend-rated Intimacy across sociometric groups resulted in a marginally significant ( $p = .10$ ) decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraint of the correlation between means-ends beliefs about Self and Intimacy in the group of rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta\chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a). Thus, the univariate tests indicated that the correlation of means-ends beliefs about Self and Intimacy in the group of rejected children differed significantly from the corresponding correlations in the groups of popular and average children.

As shown in Figure 15, across the average and popular group means-ends beliefs about Self were invariantly lowly and positively correlated with friend-rated Intimacy ( $r(z = 2.44; se = .07) = .16$ ). In contrast, in the rejected group means-ends beliefs about Self were lowly and negatively correlated with friend-rated Intimacy ( $r(z = -1.66; se = .15) = -.26$ ), although this correlation was only marginally significant. In contrast, sociometric status did not moderate the relationships of means-ends beliefs about Luck and Adults with friend-rated Intimacy. Means-ends beliefs about Luck and Adults were not reliably correlated with friend-rated Intimacy ( $r(z = 0.07; se = .07) = .00$  and  $r(z = 1.92; se = .06) = .12$ , respectively) although the low and positive correlation of means-ends beliefs about Adults with friend-rated Intimacy approached the conventional  $\alpha$  level of two-tailed significance.

The multivariate test of invariance of the correlations of all three dimensions of the means-ends beliefs and friend-rated Conflict across sociometric groups resulted in a significant decrement in fit when compared to the metrically invariant model (see Table 17, comparison of Model 1 vs. Model 3) indicating that sociometric status moderated the relationships. Relaxing the constraint of the correlation between means-ends beliefs about

Self and Conflict in the group of rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 3 versus Model 3a), and a nonsignificant  $\Delta\chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 3a).

As seen in Figure 15, across the average and popular group means-ends beliefs about Self were invariantly lowly and negatively correlated with friend-rated Conflict ( $r(z = 2.30; se = .07) = -.16$ ) while in the rejected group means-ends beliefs about Self were moderately highly and positively correlated with friend-rated Conflict ( $r(z = 3.43; se = .15) = .51$ ). Finally, both means-ends beliefs about Luck and Adults were invariantly not reliably correlated with friend-rated Conflict ( $r(z = 0.66; se = .07) = .05$  and  $r(z = -0.17; se = .07) = -.01$  for means-ends beliefs about Luck and Adults, respectively).

#### 4.2.3.3 Goal Difficulty and Friend-rated Friendships Quality

Testing cross-group invariance of the correlations of Goal Difficulty with both aspects of friendship quality resulted in a significant decrement in fit when compared to the metrically invariant model (see Table 17, comparison of Model 1 vs. Model 2). Relaxing the constrained correlations between Goal Difficulty with Conflict in the popular group resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta\chi^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 4a).

While in the group of popular children Goal Difficulty was not reliably related with friend-rated Conflict ( $r(z = -0.87; se = .13) = -.11$ ) across the average and rejected groups Goal Difficulty was invariantly moderately highly and positively related with friend-rated Conflict ( $r(z = 4.20; se = .08) = .34$ ). Across all groups Goal Difficulty was invariantly not reliably related to the friends' views of Intimacy ( $r(z = 0.03; se = .07) = .00$ ).

#### 4.2.3.4 Action Strategies and Friend-rated Friendship Quality

As seen in Table 17, testing invariance of the correlations of the three types of action strategies with friend-rated Intimacy across the groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 2). Relaxing the constraints of the correlations between Intimacy and Direct Action in the

group of rejected children resulted in a significant increment in fit when compared to the previous model (see comparison of Model 2 versus Model 2a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 2a).

Table 17

*Testing Invariance of the Latent Correlations of Agency and Means-ends Beliefs, Action-Strategies, and Goal Difficulty with Friend-rated Friendship Quality (i.e., Intimacy and Conflict) across Groups of Friended Average, Popular, and Rejected Children*

Metrically inv. (i.e., Baseline)		Test		$\Delta$					
$X^2$	df	Model Description	$X^2$	df	Comp.	$\Delta X^2$	df	p	
Agency Beliefs and Friend-rated Friendship Quality									
1)	644.33	618a	2) All agency beliefs and Intimacy	663.33	624	1 : 2	19.20	6	<.01
			2a) Rejected: Self free	656.79	623	1 : 2a	12.46	5	.03
						2 : 2a	6.54	1	.01
			3a) Rejected: Adults free	660.74	622	1 : 3a	16.41	5	<.01
						2 : 3a	2.59	1	.10
			4a) Rejected: Self, Adults free	650.44	622	1 : 4a	6.11	4	.19
			2 : 4a	13.09	2	<.01			
		3) All agency beliefs and Conflict	651.95	624	1 : 3	7.62	6	.27	
Means-ends Beliefs and Friend-rated Friendship Quality									
1)	710.31	618a	2) All means-ends beliefs and Intimacy	720.89	624	1 : 2	10.58	6	.10
			2a) Rejected: Self free	715.31	623	1 : 2a	5.00	5	.42
						2 : 2a	5.58	1	.02
			3) All means-ends beliefs and Conflict	724.69	624	1 : 3	14.38	6	.03
			3a) Rejected: Self free	711.06	623	1 : 3a	0.75	5	.98
						3 : 3a	13.23	1	<.01
Goal Difficulty and Friend-rated Friendship Quality									
1)	710.31	618a	2) Difficulty and Intimacy and Conflict	721.80	622	1 : 2	11.49	4	.02
			2a) Popular: Difficulty - Conflict free	712.92	619	1 : 2a	2.61	3	.46
						2 : 2a	8.88	1	<.01
Action Strategies and Friend-rated Friendship Quality									
1)	447.84	412b	2) All strategies and Intimacy	464.47	418	1 : 2	16.63	6	.01
			2a) Rejected: Direct Action free	455.43	417	1 : 2a	7.59	5	.18
						2 : 2a	9.04	1	<.01
			3) All strategies and Conflict	476.31	418	1 : 3	28.47	6	<.01
			3a) All groups: Direct Action free	450.08	414	1 : 3a	7.59	2	.33
					Rejected: Seek Help, Action Omission free			3 : 3a	26.23

*Note.* Comp. = Comparison, inv. = invariant. By fixing the loadings of the measurement model the here reported measurement invariant models gained a = 90 and b = 30 df.

As seen in Figure 16, in the group of rejected children Direct Action evinced a moderately high and negative correlation with Intimacy ( $r(z = -2.11; se = .16) = -.34$ ) while this

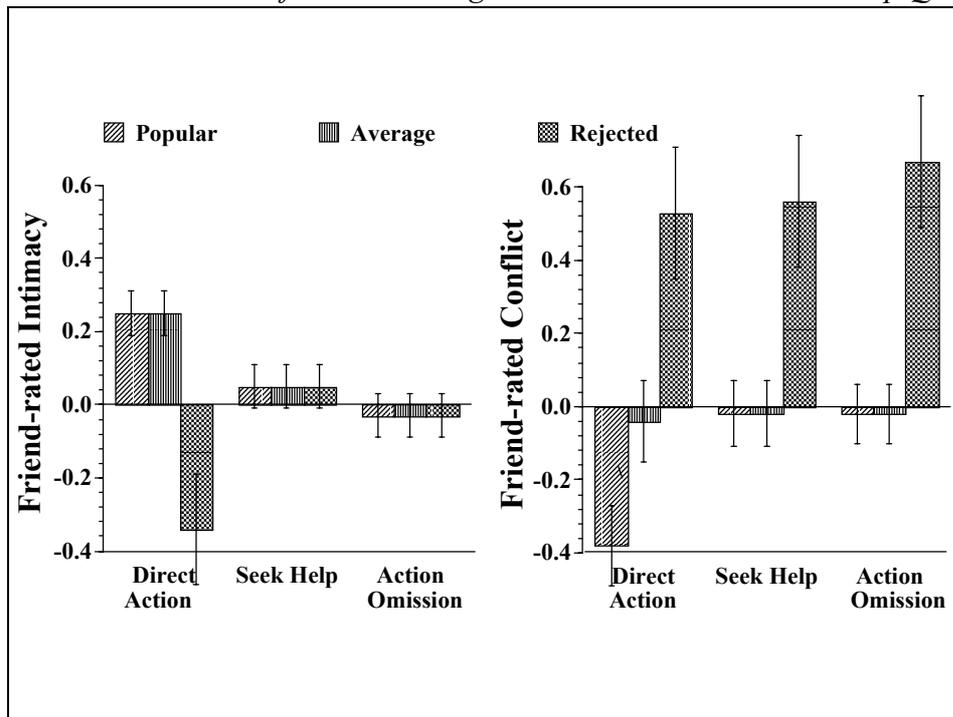
strategy was invariantly lowly and positively correlated with Intimacy ( $r(z = 3.51; se = .07) = .25$ ) across the groups of popular and average children. In contrast, sociometric status did not moderate the relationships of Seeking Help and Action Omission with friend-rated Intimacy which were not reliably different from zero ( $r(z = 0.70; se = .08) = .05$  and  $r(z = -0.50; se = .07) = -.03$ , respectively).

As shown in Table 17, testing invariance of the correlations of the three types of action strategies with the friends' perceptions of Conflict across the groups resulted in a significant decrement in fit when compared to the metrically invariant model (see comparison of Model 1 vs. Model 3). Relaxing the constraints of the correlations of friend-rated Conflict with (a) Direct Action in all groups of children and (b) Seeking Help and Action Omission in the rejected group resulted in a significant increment in fit when compared to the previous model (see comparison of Model 3 versus Model 3a), and a nonsignificant  $\Delta X^2$  value when compared with the metrically invariant model (see comparison of Model 1 versus Model 3a).

As depicted in Figure 16, in the group of rejected children Direct Action evinced a moderately high and positive correlation with friend-rated Conflict ( $r(z = 3.14; se = .17) = .53$ ). In contrast, in the group of popular children Direct Action was moderately highly and negatively correlated with friend-rated Conflict ( $r(z = -3.32; se = .11) = -.38$ ) while in the group of average children this strategy was not reliably correlated with friend-rated Conflict ( $r(z = -0.44; se = .10) = -.04$ ).

Across the average and popular group Seeking Help and Action Omission were invariantly not reliably correlated with friend-rated Conflict ( $r(z = -0.24; se = .09) = -.02$  and  $r(z = -0.31; se = .08) = -.02$ , respectively). In contrast, in the group of rejected children the friends' views of Conflict were highly and positively correlated with both Seeking Help ( $r(z = 3.12; se = .18) = .56$ ) and Action Omission ( $r(z = 3.72; se = .18) = .67$ ).

Figure 16  
*Latent Correlations of Action Strategies and Friend-rated Friendship Quality*



#### 4.2.3.5 Additional Analyses: Investigating the Interplay of Agency and Means-ends Beliefs in the Prediction of Friend-rated Friendship Quality across Sociometric Groups of Friended Children

In order to investigate the interplay of agency and means-ends beliefs in the prediction of friend-rated friendship quality, I conducted hierarchical multiple regression analyses (e.g., Aiken & West, 1991). In a first step, I entered gender and grade in order to control for their effects on the relationships. Then, I entered agency and means-ends beliefs about one of the specific means, and dummy-coded sociometric status followed by their interaction terms. Finally, as described in Section 3.4.4.5, if the two partners had only received reciprocated friendship nominations from each other, but not from any other child they had nominated, one of the dyads was randomly excluded. Table M2 in Appendix M shows the *t*-values of agency and means-ends beliefs and other significant terms of this model. As shown in the table, none of the interactions of agency and means-ends beliefs was significant. Thus, evidence for the proposed multiplicative relationships between agency beliefs and means-ends beliefs and friend-rated friendship quality, was not found.

Moreover, the multiple regression analyses replicated the results of the SEM analyses (see Section 4.2.3.1 and Section 4.2.3.2) that peer rejection moderated the relationships of agency beliefs about Self and friend-rated Intimacy ( $t = -2.07$ ) as well as the relationships of means-ends beliefs about Self and friend-rated Conflict ( $t = 2.87$ ).

On the basis of these results, in a next step, I investigated the moderating effects of peer rejection on the relationships of agency and means-ends beliefs about Self and friend-rated friendship quality. Specifically, I examined the partial belief-outcome relationships separately for the groups of accepted children (i.e., popular and average children) and the group of rejected children. I specified a series of multiple regression models in which agency and means-ends beliefs about Self were simultaneously entered as predictors of either friend-rated Intimacy or friend-rated Conflict. Importantly, the linear and quadratic effects of grade and gender were controlled by partialling their effects from both independent and dependent variables. Table 18 shows the results of these analyses. The table also depicts the standardized betas (i.e., partial correlations) of bivariate regression models which I specified for agency and means-ends beliefs about Self separately.

Table 18  
*Simple and Partial Relationships of Agency and Means-ends Beliefs and Friend-rated Friendship Quality across Groups of Accepted (i.e., popular and average) and Rejected Children*

Dimension	Group	Agency Beliefs				Means-ends Beliefs			
		Simple		Partial		Simple		Partial	
		<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Friend-rated Intimacy									
Self	Accepted	.25**	4.49	.32**	4.14	.12**	2.15	.11	1.34
	Rejected	.00	0.98	.10	0.41	.06	0.71	-.14	-0.54
Friend-rated Conflict									
Self	Accepted	-.14*	-2.53	-.10	1.50	-.11*	-2.06	-.03	-0.42
	Rejected	.11	0.70	-.31	-1.34	.32*	2.11	.55*	2.42

*Note.* The effects of gender, and linear and quadratic effects of grade were partialled before the variables were entered in the analyses. *b* = standardized betas, *t* = *t*-value of beta, Rejected = rejected children, Accepted = average and popular children, Simple = standardized betas of bivariate regression models entering only one of the beliefs as predictors, Partial = standardized betas of the multiple regression models entering agency and means-ends beliefs about a specific means simultaneously.

As seen in the table, the bivariate correlations (i.e., simple effects) replicated the patterns of the latent bivariate correlations (see Section 4.2.3.1 and Section 4.2.3.2). For the group of accepted children when controlling for the effects of their counterparts, the positive relationship of means-ends beliefs about Self and friend-rated Intimacy was not significant, although the corresponding bivariate correlation was. For this group the partial relationship of both agency and means-ends beliefs about Self and friend-rated Conflict failed to reach significant levels, although both of the corresponding bivariate and negative correlations were significant. For the rejected group, when controlling for the effects of their counterparts, the positive relationship of means-ends beliefs about Self and friend-rated Conflict remained significant.

#### 4.2.3.6 Additional Analyses: Do Action Strategies Mediate the Link between Action-Control Beliefs and Friend-rated Friendship Quality?

The next set of analyses target at investigating the assumption that the effects of agency and means-ends beliefs on the friend-rated friendship quality are mediated by the action strategies. In addition, I examined whether agency and means-ends beliefs related to action strategies and friend-rated friendship quality when controlling for the influence of Goal Difficulty and Goal Importance. Given the intercorrelations among agency and means-ends beliefs, Goal Importance, Goal Difficulty, and action strategies (see Section 4.2.1.3 - Section 4.2.1.7), the magnitudes of the partial relationships with friend-rated friendship quality might be somewhat different than the respective zero-order correlations. Thus, I conducted latent multivariate regression analyses to disentangle shared and common variances of these constructs.

According to Baron and Kenny (1986) establishing a mediational relationship in which Construct B (action strategies) mediates the link between Constructs A (agency and means-ends beliefs) and C (friend-rated friendship quality) by definition contains three components: (a) A is related to C: Children's action-control beliefs should be associated with friend-rated friendship quality, (b) A is related to B: Children's action-control beliefs should be associated with their action strategies, and (c) B is related to C: Action strategies should be associated with friend-rated friendship quality.

Evidence of the presence of these relationships has been provided by the latent zero-order correlations reported above. In a true mediational relationship, in which action strategies (B) mediate the relations between action-control beliefs (A) and friendship quality (C), all of the belief-related variance in friendship quality should be accounted for by the direct effects of action strategies on friendship quality.

Finally, a mediational model requires the assumptions that (a) there is no measurement error in the mediator and (b) the dependent variable is not the cause of the mediator. The present approach satisfies the first assumption of controlling for measurement error in the mediator by means of using structural equation modeling. To satisfy the latter assumption with regard to the causal relationships among dependent variables and mediators a longitudinal design would be required.

To avoid multicollinearity among the predictor variables I established the mediational relationships of agency and means-ends beliefs separately. In the model using agency beliefs as predictors Goal Importance was included because they are related to the acceptance of a specific goal (e.g., Austin & Vancouver, 1996). Goal Difficulty and means-ends beliefs represented the second set of independent variables because of their conceptual relationship with contextual control-conditions. As mentioned above, action strategies represented the mediators and friend-rated Intimacy and Conflict represented the dependent variables.

Thus, the first three-group structural equation model combined agency beliefs, Goal Importance, action strategies and friend-rated friendship quality. The second model combined means-ends beliefs, Goal Difficulty, action strategies and friend-rated friendship quality. As in the previous analyses, agency and means-ends beliefs, and action strategies represented a three-factor structures and friendship quality represented a two-factor structure. Both agency and means-ends beliefs consisted of the dimension Self, Luck and Adults. Action strategies consisted of Direct Action, Seeking Help, and Action Omission. Importantly, the same set of indicators were used for each of the constructs as in the previously conducted analyses. The loadings of the indicators were constrained to be equal (i.e., measurement invariant). Moreover, the effects of Gender, and linear and quadratic effects of Grade were controlled.

Despite the sensitivity of the  $\chi^2$  value to model size and the large number of factors, the measurement invariant model combining agency beliefs, Goal Importance, action strategies and friend-rated friendship quality evinced satisfactory levels of fit ( $\chi^2_{(1065)} = 1461.70$ ,  $\text{NNFI} = .91$ ,  $\text{IFI} = .93$ , and  $\text{CFI} = .93$ ,  $\text{RMSEA} = .03$ ). However, the measurement invariant model combining means-ends beliefs, Goal Difficulty, action strategies and friend-rated friendship quality yielded rather low levels of fit ( $\chi^2_{(1065)} = 1496.85$ ,  $\text{NNFI} = .85$ ,  $\text{IFI} = .88$ , and  $\text{CFI} = .88$ ,  $\text{RMSEA} = .03$ ). Because the previous analyses provided sufficiently evidence of the tenability of the proposed factor structure I accepted both models. These metrically invariant models represented the baseline models of the following comparisons because the models assessing the structural relationships among the constructs are nested in this model. Fixing the values of the measurement model (factor loadings and unique variances of the indicators) to the estimated values resulted in 108 additional degrees of freedom.

In the next step, I assessed whether action strategies mediate the relations between action-control beliefs and friendship quality. In order to do so, I regressed the action strategies on the specific sets of independent variables. Thereby, the independent variables were allowed to covary freely with each other (e.g., agency beliefs and Goal Importance were defined as intercorrelated, independent variables). Similarly, the mediators (i.e., Direct Action, Seeking Help, and Action Omission) were allowed to covary feely with each other. Moreover, the dependent variables (i.e., friend-rated Intimacy and Conflict) were defined as intercorrelated, dependent variables. The dependent variables were regressed on the mediators (i.e., action strategies). Importantly, regression paths whose coefficients did not differ significantly from zero were constrained to zero. If the local fit indices indicated that a direct path between the independent variables (e.g., agency beliefs and Goal Importance) and the dependent variables (friend ratings of friendship quality) would lead to a significant increment in fit this direct path was estimated. In addition, paths were constrained to be invariant across the groups if the constraint did not result in a significant decrement of fit.

Following the propositions of section 3.5.6, the significance level for accepting the alternative hypotheses of existing relationships among the latent constructs and cross-group invariance of these relationships was set at  $p < .05$ . However, the significance level for

accepting the final models representing the structural relationships among the latent constructs was set at  $p > .05$ . Given the parsimony gained and the important theoretical meaning represented by the much greater number of constraints of the final models over the measurement invariant models, this level of significance appeared to be appropriate.

The final model of the structural relationships among agency beliefs, Goal Importance, action strategies, and friend-rated friendship quality did not result in a significant loss in fit when compared with the respective measurement invariant model ( $\Delta \chi^2_{(62)} = 74.84, p = .13$ ). The final model of the structural relationships among means-ends beliefs, Goal Difficulty, action strategies, and friend-rated friendship quality did not result in a significant loss in fit when compared with the respective measurement invariant model ( $\Delta \chi^2_{(61)} = 76.70, p = .09$ ). However, due to multicollinearity among means-ends beliefs about Self, Goal Difficulty, and Seeking Help and Action Omission the standard errors of the regression weights were exceedingly large in the group of rejected children. In order to solve this multicollinearity problem I fixed three of the relationships to the values of the latent zero-order correlations (see Section 4.2). The model containing the additional constraints did not result in a significant loss in fit when compared with the respective measurement invariant model ( $\Delta \chi^2_{(64)} = 80.36, p = .08$ ). Moreover, the fit of this model was not significantly different from the fit of the model where these regression paths were freely estimated ( $\Delta \chi^2_{(3)} = 3.66, p = .30$ ).

Figure 17 shows the most important significant latent structural relationships of agency beliefs, action strategies, and friend-rated friendship quality on the left side and the significant latent structural relationships of means-ends beliefs, action strategies, and friend-rated friendship quality on the right side. For agency beliefs the most important relationships involved Direct Action. In contrast, for means-ends beliefs the most important relationships involved Action Omission.

The figure depicts the models in reticular algebraic model (RAM) notation (McArdle & McDonald, 1984). In RAM notation, circles represent latent variables and one-headed arrows represent regression weights, while two-headed arrows represent variances or covariances. In order to reduce the complexity of the representation the covariances among

the constructs of each set of constructs are omitted. The covariances among the constructs are reported in Section 4.2.

Both agency and means-ends beliefs about Self evinced invariantly a high and positive relationships with Direct Action. Importantly, as described in Section 4.2.1.9, the positive relationship of means-ends beliefs about Self was due to shared variance with the corresponding agency beliefs. Thus, this relationship dropped to nonsignificant levels when controlling for the effects of agency beliefs. As a consequence, the relationships of means-ends beliefs about Self and Direct Action are not depicted in the figure. In turn, Direct Action mediated the relationships of the self-related beliefs and friend-rated Intimacy with the exception of the average group. In the group of average children Direct Action did not explain unique variance of friend-rated Intimacy and, thus, agency beliefs about Self evinced a direct path on friend-rated Intimacy. For the popular children self-related agency beliefs, in addition to their indirect relationship, evinced a significant direct and positive relationship with the friends' views of Intimacy. For the average group both agency and means-ends beliefs about Self also evinced a direct and negative path on friend-rated Conflict. However, as described in the previous section, the relationship of means-ends beliefs about Self and friend-rated Conflict was due to shared variance with the corresponding agency beliefs.

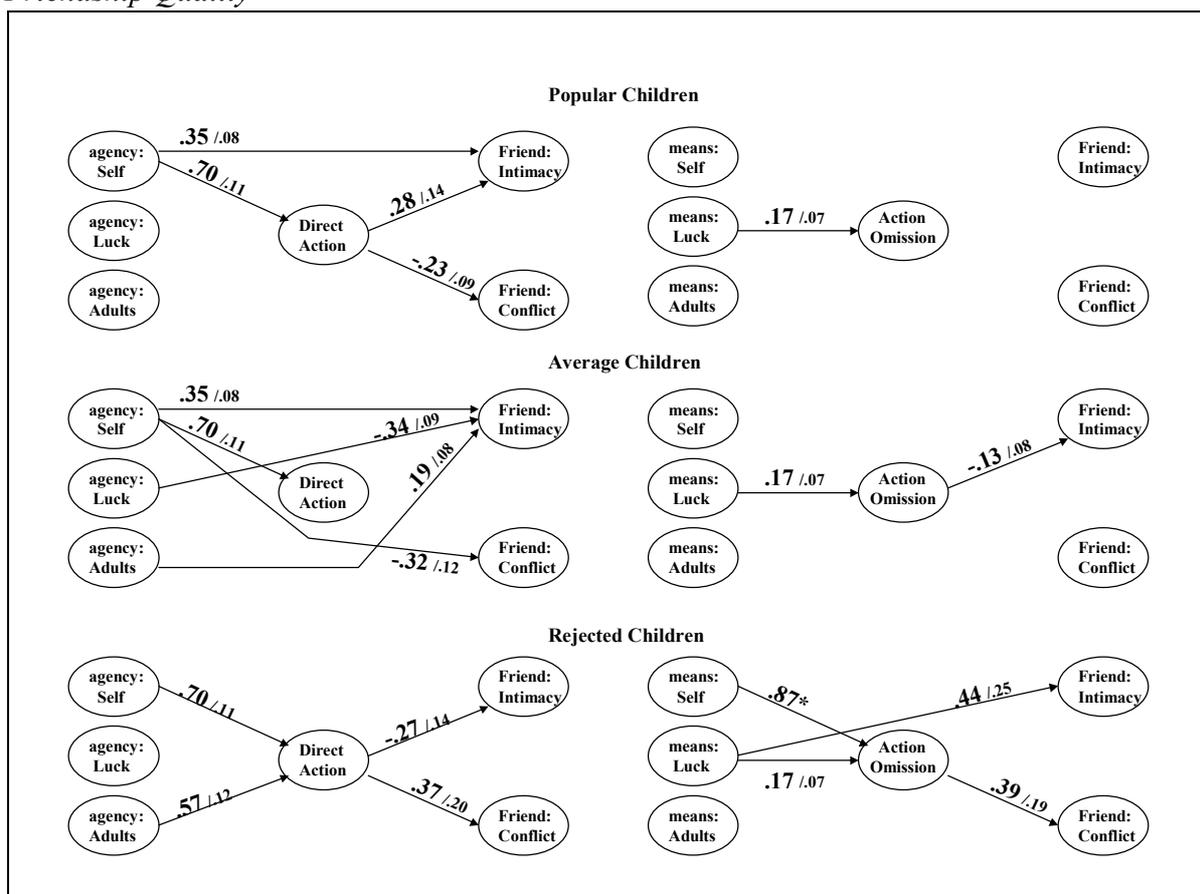
Importantly, in the group of rejected children the relationship between Direct Action and friend-rated Intimacy was in opposite direction compared to the popular group. For rejected children Direct Action was negatively related to friend-rated Intimacy. In a similar vein, while Direct Action was negatively related to friend-rated Conflict for popular children, for rejected children this path was positively directed. Thus, for the rejected group, agency beliefs about Self were indirectly related to friend-rated friendship quality because there were no significant zero-order correlations among these constructs. In contrast, the relationships between means-ends beliefs about Self and the friends' views of both Intimacy and Conflict were fully mediated by Direct Action.

While the latent zero-order correlations of agency beliefs about Luck and friend-rated Intimacy were invariantly nonsignificant across groups, when accounting for the variance that

agency beliefs about Luck shared with the remaining agency beliefs they evinced a negative and direct path to Intimacy in the average group.

Means-ends beliefs about Luck were invariantly positively related to Action Omission. For the average group, Action Omission, in turn, was negatively related to friend-rated Intimacy. This indicates suppression effects because the corresponding latent zero-order correlation was not significant. For the rejected group Action Omission was positively related to friend-rated Conflict. Hence, in this group the relationships between means-ends beliefs about Self and the friends' views of Conflict were fully mediated by Action Omission and Direct Action.

Figure 17  
*Partial Relationships of Agency and Means-ends beliefs, Action Strategies, and Friend-rated Friendship Quality*



Note. In order to reduce the complexity of the representation only important relationships are depicted for both agency and means-ends beliefs. For both agency and means-ends beliefs the models included each of the action strategies (i.e., Direct Action, Seeking Help, and Action Omission) and a relevant control variable (i.e., Goal Importance and Goal Difficulty for agency and means-ends beliefs, respectively). The covariances among the constructs of each set of constructs are omitted. In the rejected group of children the fixed relationship of the means-ends beliefs about Self and Action Omission is signified by "\*". All reported regression coefficients are significant ( $p < .05$ , one-tailed tests).

Moreover, in the rejected group means-ends beliefs about Luck also evinced a positive partial relationship with friend-rated Intimacy. When the path between means-ends beliefs about Luck and friend-rated Intimacy was fixed to zero, Action Omission evinced a positive path to friend-rated Intimacy, although the regression weight was only marginally significant ( $\beta$  ( $z = 1.44$ ;  $se = .17$ ) = .24). Thus, means-ends beliefs about Luck explained both unique and common variance of the friends' views of Intimacy while Action Omission explained only common variance of the friends' views of Intimacy. Means-ends beliefs about Luck were related to passive behaviors which, in turn, were related to higher evaluations of friendship Intimacy by the friends. However, the positive relationship of Action Omission and friend-rated Conflict indicates that passive behaviors were not unequivocally related to positive friendship outcomes in the rejected group.

For both the popular and the rejected group of children, both agency and means-ends beliefs about Adults were unrelated to action strategies and friend-rated friendship quality. The exception was a positive relationship of agency beliefs about Adults and Direct Action in the rejected group. For the average group both agency and means-ends beliefs about Adults were directly related to increases in the friends' views of Intimacy, although in the means-ends beliefs system this path was not significant ( $\beta$  ( $z = 1.62$ ;  $se = .08$ ) = .13).

Figure 17 does not depict that Seeking Help was invariantly positively related to both agency and means-ends beliefs about Self ( $\beta$  ( $z = 5.14$ ;  $se = .07$ ) = .36 and  $\beta$  ( $z = 5.66$ ;  $se = .09$ ) = .51, respectively). In the rejected group the relationship of means-ends beliefs about Self and Seeking Help was fixed at the value of the latent zero-order correlation ( $r = .87$ ) which was significantly higher than the the corresponding relationships in the remaining groups. In the group of average children this action strategy was also positively related to both agency and means-ends beliefs about Adults ( $\beta$  ( $z = 3.38$ ;  $se = .08$ ) = .27 and  $\beta$  ( $z = 3.80$ ;  $se = .10$ ) = .38, respectively). The latter path between means-ends beliefs about Adults and Seeking Help replicated in the group of rejected children.

The figure does not depict that, with the exception of the average group, agency beliefs about Luck did not evince a single partial relationship with action strategies and friend

ratings. For the average group agency beliefs about Luck were positively related to Action Omission ( $\beta$  ( $z = 2.00$ ;  $se = .08$ ) = .18).

Moreover the figure does not depict the invariant relationship of Goal Importance and Direct Action ( $\beta$  ( $z = 4.75$ ;  $se = .12$ ) = .57). In addition, Goal Importance evinced a negative relationship with friend-rated Intimacy in the popular group ( $\beta$  ( $z = 2.30$ ;  $se = .17$ ) = -.39) and a positive relationship with friend-rated Conflict in the average group ( $\beta$  ( $z = 2.25$ ;  $se = .12$ ) = .27). In the rejected group, Goal Importance evinced a marginally significant and positive relationship with Seeking Help ( $\beta$  ( $z = 1.77$ ;  $se = .44$ ) = .78).

For the popular group, Goal Difficulty evinced a significant and positive relationship with Direct Action ( $\beta$  ( $z = 2.79$ ;  $se = .14$ ) = .39) and, hence, was indirectly related to both aspects of friendship quality. In contrast, in the average group this control-related dimension was positively related to Action Omission ( $\beta$  ( $z = 4.25$ ;  $se = .08$ ) = .34) but not to Direct Action. In addition, in the average group Goal Difficulty evinced a direct and positive relationship with friend-rated Conflict ( $\beta$  ( $z = 3.50$ ;  $se = .10$ ) = .35). Moreover, in the rejected group, when accounting for the relationship between means-ends beliefs about Self and Action Omission, the relationship of Goal Difficulty and this strategy was nonsignificant despite the significant zero-order correlation of these constructs. In contrast, in the rejected group Goal Difficulty explained unique variance of Seeking Help when controlling for the relationships of the means-ends beliefs. The latter relationship was fixed at the value of the latent zero-order correlation ( $r = .81$ ).

#### 4.2.3.7 Additional Analyses: Controlling for the Effects of RAVEN Intelligence, School Grades, Aggression, and Social Desirability on the Relationships of Perceived Control, Action Strategies and Friend-rated Friendship Quality

RAVEN intelligence, school achievement, aggressive behaviors, and behaving in normatively and socially desirable ways have been demonstrated to be related to peer relationships (see Theory Section 2.4.3.2). Some of these variables (e.g., intelligence, aggressive behaviors) can be considered as mediating the relationships of agency and means-ends beliefs, Goal Difficulty, Goal Importance, and Action Strategies with the friends' views of friendship quality. However, some of these variables can be also thought as third variables

influencing agency and means-ends beliefs, Goal Difficulty, Goal Importance, and Action Strategies as well as the friends' views of friendship quality (e.g., school achievement).

In order to test the effects of the covariates three three-group models including the groups of friended average, popular, and rejected children were specified. Each of these models included all four covariates. One of the models included, in addition to the four covariates, the agency beliefs, Goal Importance, and friend-rated friendship quality as latent constructs. This metric invariant model evinced satisfactory levels of fit ( $\chi^2(1032) = 1464.22$ ,  $\text{NNFI} = .90$ ,  $\text{CFI} = .92$ ,  $\text{IFI} = .93$ ,  $\text{RMSEA} = .03$ ). Another model included, in addition to the four covariates, the means-ends beliefs, Goal Difficulty, and friend-rated friendship quality as latent constructs. This metric invariant model evinced low levels of fit ( $\chi^2(1032) = 1591.05$ ,  $\text{NNFI} = .81$ ,  $\text{CFI} = .85$ ,  $\text{IFI} = .86$ ,  $\text{RMSEA} = .04$ ). Another model included, in addition to the four covariates, the action strategies and friend-rated friendship quality as latent constructs. This metric invariant model evinced low levels of fit ( $\chi^2(821) = 1162.50$ ,  $\text{NNFI} = .84$ ,  $\text{CFI} = .87$ ,  $\text{IFI} = .88$ ,  $\text{RMSEA} = .03$ ). Moreover, as has been done in the main analyses, in each of the models Gender and linear and quadratic effects of grade were controlled.

Table O1 in Appendix O provides the descriptive statistics (i.e., mean, standard deviation, minimum, maximum, skewness, and kurtosis) of the four covariates across the sociometric groups of friended and friendless children. As seen in the table peer nominations of aggression violate assumptions of normality as indicated by their rather large values of skewness and kurtosis. However, the results of the analyses were robust when using the natural logarithm of this variable to improve its distributional characteristics.

The analyses of univariate covariate effects revealed that the relationships of agency and means-ends beliefs, and Goal Difficulty with both friend-rated Intimacy and Conflict were robust (the net relationships of agency and means-ends beliefs, Goal Difficult, and Goal Importance with the friends' views of friendship quality are tabled in Table O2 in Appendix O). In a similar vein, the relationships of action strategies with both friend-rated Intimacy and Conflict were robust (the net relationships of action strategies with the friends' views of friendship quality are tabled in Table O2 in Appendix O). The univariate analyses showed that when statistically controlling for the four covariates, the relationships that have been found to

be significant in the previously conducted analyses remained significant while the relationships that have been found to be nonsignificant remained nonsignificant.

Exceptions evinced when controlling for the effects of Social Desirability on the correlations of agency and means-ends beliefs, and action strategies with friend-rated friendship quality in the group of popular children. Specifically, when partialling Social Desirability from both agency beliefs about Self and friend-rated Conflict, the correlation between these constructs decreased to a nonsignificant value ( $r(z = -0.87; se = .13) = -.12$ , see Table O2 in Appendix O). Importantly, the relationship of agency beliefs about Self and friend-rated Intimacy remained substantial ( $r(z = 1.77; se = .13) = -.23$ ), although it also decreased when controlling for Social Desirability.

Moreover, when controlling for the effects of Social Desirability the correlations of means-ends beliefs about Self with friend-rated Intimacy and Conflict decreased to nonsignificant values ( $r(z = 0.44; se = .14) = .06$  and  $r(z = -0.32; se = .14) = -.04$ , for friend-rated Intimacy and Conflict, respectively).

In a similar vein, the partial correlations of Direct Action and both Intimacy and Conflict decreased to marginally significant values ( $r(z = 1.63; se = .15) = .25$  and  $r(z = -1.49; se = .15) = -.23$ , for friend-rated Intimacy and Conflict respectively; see Table O3 in Appendix O).

In sum, the control analyses showed that the relationships of agency and means-ends beliefs, Goal Difficulty, Goal Importance, and action strategies with the friends' views of friendship quality basically remained unchanged when controlling for the four alternative predictors of friendship quality. The exception was that popular children's tendencies to behave in socially desired ways affected the strength of the relationships of agency and means-ends beliefs, and action strategies with friend-rated friendship quality. However, although the relationship of agency beliefs about Self and friend-rated Intimacy was lower when controlling for Social Desirability, although it remained substantial.

#### 4.3 Exploratory Analyses of a Possible Mechanism Underlying the Relationship between Perceived Control and Friendship: Do Friendless Children Differ in their Ascribed Importance of Friendships from Friendled Children?

The univariate test of invariance of the mean levels of goal importance across sociometric groups of friendled and friendless children resulted in a nonsignificant  $\Delta \chi^2$  value when compared to the measurement-invariant five-group model (i.e.,  $\Delta \chi^2_{(4)} = 5.92$ ,  $p = .21$ ). Thus, friendled and friendless children did not differ in the perceived importance of friendship goals regardless of their sociometric status.

Table 19 provides an overview of the results of testing invariance of correlations of perceived control, action strategies, and Goal Importance across sociometric groups of friendled and friendless children. As seen the table, there were only few significant differences in the correlations across grade levels as well as across sociometric groups of friendled and friendless children.

Table 19

*Testing Invariance of Latent Correlations of Goal Importance and Agency and Means-ends Beliefs, Action-Strategies, Goal Difficult, and Friendship Quality across Sociometric Groups of Friendled and Friendless Children*

Metrically inv. (i.e., Baseline)		Test	$\Delta$					
$\chi^2$	df		$\chi^2$	df	Comp.	$\Delta \chi^2$	df	p
1) 786.88	755b	2) All Agency Beliefs	801.52	767	1 : 2	14.64	12	.26
1) 779.97	755b	2) All Means-ends Beliefs	791.94	767	1 : 2	11.97	12	.45
1) 150.02	194c	2) Goal Difficulty	153.68	198	1 : 2	3.65	4	.45
1) 801.93	755b	2) All Action Strategies	809.30	767	1 : 2	7.37	12	.83
1) 1139.29	1022a	2) Self-rated Intimacy and Conflict	1145.07	1030	1 : 2	5.78	8	.67
1) 644.33	618d	2) Friend-rated Intimacy and Conflict	658.68	622	1 : 2	14.35	4	<.01
		2a) Average: Importance-Intimacy free	645.12	619	1 : 2a	0.79	1	.37
		All groups: Importance-Conflict free			2 : 2a	13.56	3	<.01
1) 285.66	272e	2) Number of Mutual Friendships	293.47	274	1 : 2	7.81	2	.02
		2a) rejected free	287.34	273	1 : 2a	1.68	1	.19
					2 : 2a	6.13	1	.01

*Note.* Comp. = Comparison, inv. = invariant. By fixing the parameters of the measurement model the here reported models gained a = 126 df, b = 105 df, c = 45 df, d = 90 df, and e = 13 df.

Table 20 provides an overview of the correlations of Goal Difficulty and the remaining target constructs across sociometric groups of friended and friendless children. Generally, the evinced correlational patterns of Goal Importance and both agency and means-ends beliefs supported the assumption that Goal Importance was rather highly related to agency beliefs and self-related means-ends beliefs. More specifically, Goal Importance evinced high and positive correlations with both agency and means-ends beliefs about Self. Moreover, generally, the patterns of relationships of Goal Importance with both action strategies and friendship outcomes resembled the patterns of relationships of agency and means-ends beliefs about Self with these constructs.

Table 20

*Overview of Relationships of Goal Importance with Perceived Control, Action Strategies, and Friendship Outcomes across Sociometric Groups of Friended and Friendless Children*

Construct	<i>r</i>	<i>se</i>	<i>z</i>	Exception:	<i>r</i>	<i>se</i>	<i>z</i>
Agency: Self	.55	(.04)	13.99				
Agency: Luck	.27	(.05)	5.37				
Agency: Adult	.21	(.05)	3.99				
Means-ends: Self	.55	(.04)	12.52				
Means-ends: Luck	.33	(.06)	5.77				
Means-ends: Adults	.15	(.06)	2.60				
Goal Difficulty	.23	(.06)	3.98				
Direct Action	.68	(.04)	15.60				
Seeking Help	.38	(.06)	6.09				
Action Omission	.04	(.06)	0.58				
Self-rated Intimacy	.32	(.05)	6.21				
Self-rated Conflict	.06	(.06)	1.03				
Friend: Intimacy	.01	(.10)	-0.10	Average:.	.27	(.08)	3.33
Friend: Conflict				Average:	.06	(.10)	-0.61
				Popular:	-.22	(.10)	1.86
				Rejected:	.41	(.19)	2.23
Number of Mutual Friendships	-.09	(.06)	-1.51	Rejected:	.27	(.12)	2.14

*Note.* *r* = latent correlation, *se* = LISREL estimate of the standard error, *z* = *z*-value. The comparisons of the correlations of Goal Importance and the number of mutual friendships were conducted across sociometric groups which combined both friended and friendless children.

Moreover, as seen in Table O4 in Appendix O, in the popular group the relationship of Goal Importance and friend-rated Conflict was in a similar way affected as the relationship of agency beliefs about Self and friend-rated Conflict when partialling Social Desirability, although the remaining relationships of Goal Importance and friend-rated friendship quality were robust across sociometric groups. When partialling Social Desirability from both Goal

Importance and friend-rated Conflict, the correlation between these constructs decreased to a nonsignificant value ( $r(z = -1.26; se = .13) = -.16$ ).

Finally, as reported in Section 4.2.3.6, despite the relationships of agency about Self and Goal Importance, each of these constructs explained unique variance of friend-rated friendship quality across sociometric groups of friended children.

#### 4.4 Summary of the Results of the Main Analyses

The results, generally, did not support the assumption that friendless children differ in the mean levels of perceived control (i.e., agency and means-ends beliefs, and Goal Difficulty), and action strategies from friended children. The single exception which was in hypothesized direction was the result that friendless-average children had higher means-ends beliefs about Adults when compared to friended-average children.

In contrast and contrary to the hypotheses, the mean levels of external means-ends beliefs and Goal Difficulty provided some evidence for differences across sociometric groups. Specifically, popular children had lower mean levels of both means-ends beliefs about Adults and Luck compared to the remaining groups of children. Moreover, the rank ordering according to mean levels of Goal Difficulty was the following: Friended-popular children < friended-average and friendless-average children < friended-rejected and friendless-average children.

Additional analyses showed that previous findings (e.g., Krappmann et al. 1993) showing that friendless children perceive their friendships less intimate replicated in the present study, although only for the rejected group and not for the average group. Moreover, the present findings replicated previous findings (Brendgen et al., 2000) showing that friended-rejected children perceive the friendships less conflictual than their friends. However, in the present study the finding that friended-rejected children perceive the friendships more intimate than their friends replicated only at older ages (i.e., grades 5 and 6). In addition, the finding that the number of mutual friendships is related to children's sociometric status was replicated.

Consistent with the cross-sectional finding that children differentiated only to a low degree between belief types during middle childhood (see Appendix G), agency and means-

ends beliefs were highly correlated. Also consistent with the cross-sectional finding that children with age increasingly differentiated between self-related and external means (i.e., Luck and Adults) dimensions (see Appendix G), the correlations among beliefs about these means dimensions were only of moderate size. In a similar vein, consistent with the findings of the grade-level comparisons, patterns of salient and nonsalient correlations among beliefs, strategies, and friendship outcomes evinced.

More specifically, agency beliefs about Self evinced the strongest relationships with Direct Action followed by agency beliefs about Luck and Adults. In line with the low degree of differentiation between belief types, means-ends beliefs evinced a similar pattern of relationship with this strategy, although children's beliefs about the usefulness of adults' help was unrelated to their problem-solving attempts. Importantly, when controlling for agency beliefs about Self, the relationship of means-ends beliefs about Self and Direct Action dropped to nonsignificant levels. Similarly, when controlling for agency beliefs about Self, the relationships of agency beliefs about Luck and Adults were unreliable. Thus, agency beliefs about Self were the strongest predictor of children's active problem-solving. Moreover, the patterns of salient and nonsalient relationships showed that external means-ends beliefs were more highly related to Action Omission than the remaining beliefs. Each of the agency and means-ends beliefs dimensions were about equally highly correlated with help-seeking behaviors. However, significant differences in the correlational patterns of salient and nonsalient relationships evinced among contingency beliefs (i.e., means-ends beliefs and Goal Difficulty), action omission, and self-rated friendship quality across sociometric groups of friended and friendless children.

Table 21 provides an overview of the significant differences in the correlations among perceived control, action strategies, and self-rated friendship quality. As seen at the bottom of the table, for the groups of well-adjusted children (i.e., popular and friended-average children) only a single correlation was significantly different from the corresponding correlations across the remaining groups. This single difference in correlations for friended-average children when compared to the remaining groups was presumably due to chance. The remaining correlations which were significantly different from the correlations across the majority of the groups evinced in the groups of children with difficulties in peer relationships (i.e., friended-

rejected, friendless-rejected, and friendless-average children). The rank ordering according to the number of significantly different correlations when compared to the remaining groups was: 15 correlations in the friendless-rejected group = 8 correlations in the friendless-average group > 7 correlations in the friended-rejected group.

Conducted binomial tests using the normal distribution as an approximation of the binomial distribution and Yates continuity-corrections (see, e.g., Bortz, Lienert, & Boehnke, 1990) showed that for each of these groups the number of correlations which were significantly different from the corresponding correlations across the remaining groups exceeded the number of correlations that would be expected to differ by chance on the specified alpha level ( $p \leq .05$ ;  $z = 7.27$ ,  $p < .01$  for friendless-rejected children,  $z = 2.32$ ,  $p < .01$  for friended-rejected, and  $z = 2.94$ ,  $p < .01$  friendless-average children; two-tailed tests).

Similarly, when considering the total number of correlations among children's self ratings of perceived control, action strategies, and friendship quality (i.e., 300) which were tested across the five groups, the combined number of correlations (i.e., 24) which were significantly different from the corresponding correlations across the remaining groups exceeded the number of correlations that would be expected to differ by chance on the specified alpha level ( $p \leq .01$ ;  $z = 2.25$ ,  $p < .05$ ; two-tailed test). Moreover, conducted overall hierarchical regression analyses, generally, replicated these moderating effects of sociometric status (see Section 4.2.1.9). As a consequence, the hypothesis that the correlations among children's self-ratings of perceived control, action strategies, and friendship outcomes would not be moderated by both sociometric and friendship status had to be rejected.

As seen in the table, across each of the groups of children with difficulties in peer relationships significantly higher correlations of Goal Difficulty and means-ends beliefs evinced when compared to corresponding correlations across the majority of the groups. A general pattern across the maladjusted groups was, that specific dimensions of the means-ends beliefs were more highly correlated with Goal Difficulty compared to the remaining groups. In turn, the specific means-ends beliefs and Goal Difficulty were more highly related to either Action Omission or Seeking Help, or both.

Table 21

*Overview of Significant Differences in the Latent Correlations among Perceived Control, Action Strategies, and Self-rated Friendship Quality Across Sociometric Groups of Friendled and Friendless Children*

Correlation of Constructs	Construct A	Construct B	Group r	Baseline r
<b>Friendless-rejected Children</b>				
<i>Agency and Means-ends Beliefs</i>	agency: Self	means-ends: Self	.22 (.17)	.80 (.03)
	agency: Luck	means-ends: Luck	.53 (.17)	.90 (.02)
	agency: Selfagency Luck		.86 (.06)	.49 (.04)
<i>Means-ends and Goal Difficulty</i>	<sup>a</sup> means-ends: Self	Goal Difficulty	.77 (.10)	.19 (.06)
	means-ends: Luck	Goal Difficulty	.73 (.19)	.19 (.06)
	<sup>b</sup> means-ends: Adults	Goal Difficulty	.47 (.13)	.16 (.06)
<i>Beliefs and Action Strategies</i>	<sup>c</sup> means-ends: Adults	Seeking Help	.82 (.13)	.39 (.07)
	means-ends: Adults	Action Omission	.55 (.16)	.22 (.06)
	<sup>d</sup> Goal Difficulty	Action Omission	.66 (.11)	.28 (.06)
<i>Beliefs and Self: Friendship Quality</i>	agency: Adults	Self: Intimacy	.70 (.14)	.18 (.05)
	agency: Adults	Self: Conflict	.50 (.16)	-.03 (.06)
	<sup>e</sup> means-ends: Self	Self: Conflict	.44 (.10)	-.08 (.07)
	means-ends: Self	Self: Intimacy	.55 (.15)	.25 (.06)
	means-ends: Luck	Self: Intimacy	.67 (.16)	.11 (.07)
<i>Strategies and Self: Friendship Quality</i>	Seeking Help	Self: Intimacy	.66 (.24)	.13 (.06)
<b>Friendled-rejected Children</b>				
<i>Agency and Means-ends Beliefs</i>	agency: Adults	means-ends: Adults	.65 (.10)	.81 (.03)
<i>Means-ends and Goal Difficulty</i>	<sup>a</sup> means-ends: Self	Goal Difficulty	.77 (.10)	.19 (.06)
<i>Beliefs and Action Strategies</i>	means-ends: Self	Seeking Help	.87 (.14)	.36 (.07)
	means-ends: Self	Action Omission	.87 (.14)	.17 (.06)
	<sup>f</sup> Goal Difficulty	Seeking Help	.71 (.12)	.21 (.07)
	<sup>d</sup> Goal Difficulty	Action Omission	.66 (.11)	.28 (.06)
<i>Beliefs and Self: Friendship Quality</i>	<sup>e</sup> means-ends: Self	Self: Conflict	.44 (.10)	-.08 (.07)
<b>Friendless-average Children</b>				
<i>Means-ends and Goal Difficulty</i>	<sup>b</sup> means-ends: Adults	Goal Difficulty	.47 (.13)	.16 (.06)
<i>Beliefs and Action Strategies</i>	<sup>c</sup> means-ends: Adults	Seeking Help	.82 (.13)	.39 (.07)
	<sup>f</sup> Goal Difficulty	Seeking Help	.71 (.12)	.21 (.07)
<i>Beliefs and Self: Friendship Quality</i>	<sup>e</sup> means-ends: Self	Self: Conflict	.44 (.10)	-.08 (.07)
	Goal Difficulty	Self: Intimacy	-.08 (.08)	.35 (.07)
<i>Strategies and Self: Friendship Quality</i>	Direct Action	Self: Intimacy	.73 (.17)	.38 (.06)
	Action Omission	Self: Intimacy	-.47 (.18)	.22 (.07)
	Seeking Help	Self: Intimacy	-.36 (.18)	.13 (.06)
<b>Friendled-average Children</b>				
<i>Beliefs and Self: Friendship Quality</i>	Goal Difficulty	Self: Intimacy	.08 (.08)	.35 (.07)

*Note.* Reported are the groups in which the correlation of construct A and construct B differed significantly from the correlation of these constructs across the remaining groups. r of Baseline = correlation which evinced in the majority of the groups and, thus, represents the baseline of comparison; r of Group = correlation which differs in the specific group significantly from the baseline correlation. <sup>a-f</sup> = correlations with the same superscripts were invariant across the respective groups.

Similarly, as seen in the table, across each of the maladjusted groups, children's perceptions of Conflict were moderately highly correlated with means-ends beliefs about Self.

Consistent with the results of the mean level analyses, the analyses regarding the relationships of perceived control, action strategies, and the number of mutual friendships across sociometric groups did not provide support for the hypothesized relationships. Only Goal Difficulty evinced a significant and negative relationship with friendship quantity in the popular group, although this relationship was only marginally significantly different from the corresponding correlations for the average and rejected groups.

Table 22 provides an overview of the moderating effects of sociometric status on the relationships of agency and means-ends beliefs, action strategies, and friend-rated friendship quality. As depicted in the table, generally, the evinced differences in the correlations provided support for the hypothesized moderating effects of sociometric status. However, contrary to the hypotheses, the correlations were invariant across the groups of average and popular children with two exceptions. Direct Action and friend-rated Conflict were negatively correlated in the popular group while in the average group this correlation was not reliable. Moreover, Goal Difficulty and Conflict were nonsignificantly correlated in the popular group while this relationship was significant and positive across the average and rejected groups.

Importantly, across the average and the popular group, when controlling for the effects of their corresponding agency beliefs, the partial relationships of means-ends beliefs about Self and friend-rated Intimacy dropped substantially and were unreliable, although the corresponding bivariate correlations were reliable. For accepted children the partial relationship of both agency and means-ends beliefs about Self and friend-rated Conflict failed to reach significant levels, although both of the corresponding bivariate and negative correlations were significant. In contrast, for the rejected group, when controlling for the effects of their counterparts, the positive relationship of means-ends beliefs about Self and friend-rated Conflict remained significant.

Moreover, conducted latent multivariate regression analyses provided some evidence that action strategies mediated the relationships of agency and means-ends beliefs and friend-rated friendship quality in the group of popular and rejected children. Generally, the effects of

agency beliefs were mediated by Direct Action while the effects of means-ends beliefs were mediated by Action Omission.

Importantly, for the friended-rejected group when controlling for the effects of the corresponding agency beliefs, the relationship of means-ends beliefs about Self and Action Omission remained significant. Moreover, when controlling for the effects of the corresponding means-ends beliefs, for this group the partial relationship of agency beliefs about Self and Action Omission was reliably and negatively directed. The latter findings are complemented by the findings that the latent zero-order correlations of means-ends beliefs about Self and both Conflict and Action Omission were higher compared to the remaining groups of children. Thus, the residual variance of means-ends beliefs about Self which represents the difference between agency and means-ends beliefs about this means was related to passive behaviors. Moreover, friended-rejected children did not omit action if they felt that they have more self-related means available than they needed. However, if they felt that they would need more self-related means than they had available in order to solve friendship problems, then, they tended to omit action.

In addition to these subtractive relationships of self-related beliefs, there was also evidence for multiplicative relationships. The positive relationship between means-ends beliefs about Luck and Action Omission was lower for children with high levels of agency beliefs about Luck compared to children with low levels of agency beliefs about this means. Thus, for children who believed that they lack access to luck, beliefs about the usefulness of luck were related to passive behaviors. Conversely, compared to the previous children, children who believed to be lucky, beliefs about the usefulness of luck were less likely to lead to passive behaviors.

Moreover, control analyses showed that the relationships of agency and means-ends beliefs, Goal Difficulty, and action strategies with the friends' views of friendship quality basically remained unchanged when controlling for alternative predictors of friendship quality (i.e., RAVEN intelligence, school achievement, aggressive behaviors, and behaving in normatively and socially desirable ways). The exception was that popular children's tendencies to behave in socially desired ways affected the strength of the relationships of

agency and means-ends beliefs, and action strategies with friend-rated friendship quality. However, even in this group the relationship of agency beliefs about Self and friend-rated Intimacy remained substantial even when controlling for Social Desirability.

Finally, the results showed that differences in the ascribed importance of friendship goals did not account for differences in success to establish mutual friendships across sociometric groups of friended and friendless children.

Table 22

*Moderating Effects of Sociometric Status: Overview of Latent Correlations of Agency and Means-ends Beliefs, Action Strategies, and Friend-rated Friendship Quality and Results of Testing their Invariance*

Construct	Friend-rated Intimacy				Friend-rated Conflict			
	pop	t	ave	t rej	pop	t	ave	t rej
Agency Beliefs, Means-ends Beliefs about Self, and Direct Action								
Agency: Self	.31	=	.31	*	-.30	=	(-.16)	=
Agency: Luck								
Agency: Adults	.21	=	.21	†				
Means-ends: Self	.16	=	.16	*	(-.26)	-.16	=	-.16 * .51
Action Strategy: Direct Action	.25	=	.25	*	-.34	-.38	*	* .53
External Means-ends Beliefs, Goal Difficulty, Seeking Help and Action Omission								
Means-ends: Luck								
Means-ends: Adults	(.12)	=	(.12)	=	(.12)			
Goal Difficulty						.34	=	.34
Action Strategy: Seeking Help								* .56
Action Strategy: Action Omission								* .67

*Note.* Only significant correlations are depicted; marginally significant correlations ( $p < .10$ , two-tailed test) are reported in brackets. pop = popular children, ave = average children, rej = rejected children, t = result of the test; "=" = no significant difference across groups; "\*" = correlations were significantly different across groups ( $p < .05$ , two-tailed test); "†" = correlations were marginally significantly different across groups ( $p < .10$ , two-tailed test).