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Differences between resource control types revisited: A short term longitudinal study

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Abstract

Hawley's influential resource control theory (RCT) posits that both coercive and prosocial strategies may yield social dominance, as indexed by resource control. Based on differences in youths' relative use of these strategies, RCT a priori defines five distinct subtypes. Several studies by Hawley and colleagues have revealed substantial differences between subtypes in terms of obtained resource control and various social characteristics (e.g., agreeableness). The present longitudinal study (N = 394; M_{age} = 10.3; SD = 0.5) expands on previous work. Firstly, because several items used to assess strategies in RCT appear to confound strategy use with the resulting benefits (resource control), we disentangled between strategy use as such and obtained resource control. Secondly whereas previous work has been exclusively cross-sectional, the present study was longitudinal. ANOVAs comparing subgroups provided support for some core tenets of RCT, but not for others. For instance, bistrategic children scored high on both resource control and perceived popularity. However, bistrategics engaged in elevated bullying, and whereas Hawley asserts that they are proficient in balancing 'getting ahead' with 'getting along', their behavior appeared to evoke clear negative reactions in the peer group at large. Findings also showed that non-controllers did not experience more negative outcomes than their peers across all domains.

KEYWORDS
bistrategic controllers, coercive strategies, perceived popularity, prosocial strategies, resource control, resource control theory, social dominance, social preference

1 | INTRODUCTION

In adults and children alike, social dominance is an essential feature of dyadic or group relations (Vaughn, 1999). In developmental sciences, the concept has been defined as 'social prestige and influence and the ability to command others' attention, compliance, deference, access to privileges, and respectful treatment' (Parkhurst & Hopmeyer, 1998, p. 127). Evolutionary theorists (e.g., Buss, 1996) have asserted that people strive toward survival and reproduction in an environment that typically contains limited resources, which necessitates within-group competition. Because people differ in their ability and motivation to prevail in this competition, social dominance hierarchies ensue. Most scholars agree that stable social dominance relations serve to minimize group-level aggression and the associated costs (e.g., Pellegrini, 2008; Roseth, Pellegrini, Bohn, Van Ryzin, & Vance, 2007; Strayer & Strayer, 1976).

Traditionally, most scholars have defined social dominance in terms of aggression (i.e., a dominance hierarchy is an aggression-based hierarchy). However, in the 1970s and 1980s several human ethologists suggested that cooperative strategies (e.g., cooperation, affiliation, and reconciliation) may also contribute to establishing dominance (e.g., Charlesworth, 1988; Strayer & Strayer, 1976). For example, in their study on dominance among preschoolers, Strayer and Strayer (1976) reported that a girl low on aggression was the most dominant group member.

According to Charlesworth (1988, 1996), cooperation (i.e., helping, sharing, working with others) can function as competition over limited resources. That is, cooperation is seen as one of several possible ways to successfully acquire resources. Other ways include aggression, deception, and manipulation. Most circumstances require a combination of strategies. Charlesworth and coworkers found that preschoolers who combined cooperation with coercion to get access to a movie viewer were most effective in achieving viewing time (e.g., Charlesworth & Dzur, 1987).

In line with these ideas and results, Vaughn and coworkers (e.g., Vaughn, 1999; Vaughn & Santos, 2007) posited that despite their aggressiveness, dominant children are not, per se, maladjusted, but often are socially competent; with competence being construed as keeping a sophisticated balance between aggressive and more cooperative behaviors.

Contemporary perspectives on social dominance in children increasingly acknowledge that aggressive and cooperative behaviors may not represent two ends of a continuum, but rather be two sides of the same coin. For example, Pellegrini (2008) stated that situations where everyone has access to resources (i.e., scramble competition) will elicit higher levels of affiliation than aggression whereas the opposite is the case in situations where winners take all (i.e., contest competition).

Currently, an influential theory of social dominance in youth, including preadolescents, is Hawley's resource control theory (RCT; Hawley, 1999, 2007). Building on the work of others (e.g., Charlesworth), Hawley construes social dominance in terms of effective resource acquisition. Resources can be material (e.g., food, toys), social (e.g., alliance partners), and informational (e.g., 'facilitating the acquisition of resources').

According to RCT, two broad classes of strategies can be distinguished: coercive and prosocial. These strategies are assumed to have the same function: acquiring resources. Rather than focusing on the *structure* or *form* of behavior, in RCT the *function* of behavior (i.e., acquiring resource control) is considered essential. Coercive strategies (e.g., taking, threatening) are usually considered unappealing or even antisocial (see Hawley, Little, & Card, 2007), but they are typically effective. Prosocial strategies pertain to positive, socially acceptable behaviors people use to try to get what they want, including promising reciprocity and cooperation. Such behaviors yield resources by shaping positive other-oriented relationships (e.g., alliances, friendships), with the expectation that favors will later be returned.

Although children can employ both types of strategies, their relative use may differ. According to RCT, some children usually engage in prosocial strategies (those who put 'getting along' over 'getting ahead') whereas others primarily engage in coercive strategies.

In RCT, a person-centered approach is used to classify participants a priori into five different resource control subtypes, using arbitrary cut-off points (e.g., Hawley, 2003a,b). *Prosocial controllers* primarily use prosocial strategies, *coercive controllers* primarily use coercive strategies, *bistrategic controllers* score high on both, *non-controllers* score low on both, and the remaining *typicals* score neither low nor high on the two strategies simultaneously.

In a series of cross-sectional studies, Hawley and colleagues have examined self- and other-reported characteristics of these five subtypes (e.g., Hawley, 2002, preschoolers; Hawley, 2003a, adolescents; Hawley, 2003b, preschoolers; Hawley et al., 2007, adolescents). Findings showed that bistrategic controllers were typically the most successful in acquiring resources, followed by prosocial and coercive controllers whereas typicals and non-controllers had only average and negligible levels of resource control, respectively. Moreover, Hawley's work suggests that prosocial controllers appear to be well adapted, as evidenced by high levels of agreeableness, conscientiousness, and low levels of aggression and hostility. Their friendships with peers are motivated intrinsically (e.g., joy) whereas coercive controllers report extrinsic motivations for friendships (e.g., power). These coercive children are typically aggressive and hostile, and show elevated psychological maladjustment. Non-controllers are typically the lowest on resource control. They have also been found to report feeling socially unsuccessful, lonely, and not capable to achieve their objectives (see Hawley, 2007).

Bistrategic youth ('Machiavellians') appear to effectively balance aggression with prosocial behaviors to successfully obtain resource control. They are socially central, able to influence others, and overall well adjusted (Hawley, 1999, 2007). However, their mix of prosociality and coercion deters some peers. It appears that bistrategics encounter mixed social experiences, which for them yields alternating feelings of positivity and negativity, competence and incompetence, connection and loneliness (Hawley et al., 2007). Nevertheless, they are socially attractive. That is, they are sought out as alliance partners and mates because they have shown themselves to be effective in their material ecology (Hawley, 2014).

Taken together, the research of Hawley and colleagues has increased our understanding of social dominance in youth. However, several limitations deserve mention. Firstly, although RCT conceptually distinguishes between the use of strategies aimed to obtain resources, and the results (resources) that ensue from using those strategies, in several papers Hawley and colleagues have used items to assess strategy use that seem to confound the use of a certain strategy with the results that are acquired by using that strategy (e.g., 'This child gets what s/he wants by making verbal threats or threats of aggression'; 'I influence others by doing something in return'; Hawley, 2003a, adolescents; Hawley, Shorey, & Alderman, 2009, young adults). However, using a strategy aimed to acquire resources does not necessarily yield successful resource control. Hence, in the present work we distinguished between acting in a certain way and resources obtained (or not) by acting that way.

Secondly, although Hawley posits that testing the core tenets of RCT requires longitudinal designs (e.g., Hawley, 2002, preschoolers), in her research only cross-sectional designs have been used. Consequently, the stability of the core constructs is unknown, as well as the relationship over time between using coercive and prosocial strategies on the one hand, and relevant outcomes on the other (e.g., resource control, social functioning). Although identifying changes over time is not the main purpose of the present research, the use of a longitudinal design in our study afforded examining potential changes in children's use of resource control strategies and their associations with obtained resources and psychosocial correlates. At this point, it should be noted that RCT is largely agnostic regarding the role of age in this developmental period. However, it has for instance been found that the positive link between relational aggression and perceived popularity (i.e., social prominence) increases in magnitude from early to middle adolescence (Cillessen & Mayeux, 2004). Moreover, between fifth and ninth grade the negative link between physically aggressive behavior and sociometric popularity (i.e., likeability) weakens substantially (Cillessen & Mayeux, 2004). Also given marked developmental changes in social behaviors and the functioning of the peer group with increasing age (e.g., Harter, 2006), we considered it important to examine whether age shows systematic linkages with strategy use, obtained resources, or psychosocial functioning.

Another important issue is that it is unclear to what extent aggressive dominant youth (bistrategics) engage in bullying (i.e., aggression intended to harm, which is targeted and repeated over time, and characterized by a noticeable power difference between perpetrator and victim; Salmivalli & Peets, 2009). In their theoretical work, Hawley and colleagues (e.g., Hawley, Stump, & Ratliff, 2010) have argued that bistrategic children are unlikely to bully much because they are socially savvy individuals, who strategically employ their aggression against peers from whom there is much to be gained (e.g., children of similar status). In their view, not much can be gained from bullying powerless peers (e.g., non-controllers). Nevertheless, there are also good reasons to expect elevated bullying among bistrategics. Firstly, as do bullies, bistrategics engage in substantial aggression. Moreover, similar to bistrategics who are assumed to pursue social dominance, many researchers agree that bullies strategically attempt to gain prestige and power in the peer group (e.g., Salmivalli & Peets,

2009). Noteworthy, previous research (Olthof, Goossens, Vermande, Aleva, & Van der Meulen, 2011), albeit cross-sectional, has shown that most children classified as (ringleader) bullies were bistrategics. In the present work, we pitted the opposing predictions about whether bistrategics would engage in higher levels of bullying.

The present study followed children during the last 3 years of elementary school (i.e., grade 4–6). This developmental period was chosen for several reasons. Firstly, given that most studies examining RCT (social dominance) have focused on early childhood or adolescence, this period is relatively understudied. Secondly, in the later elementary years (but much less so before), children have acquired the capacity to reliably differentiate between peers primarily using coercive strategies, and those who primarily engage in prosocial strategies (Hawley, 1999). Moreover, the importance of being socially powerful is high in this period (Youniss, McLellan, & Strouse, 1994). Finally, previous work has shown that the incidence of bullying peaks around age 11 (e.g., Eslea & Rees, 2001).

We examined differences between the five resource control subtypes in terms of five specific correlates that are relevant for RCT as well as the developmental period examined. Specifically, we included two constructs that figure prominently in RCT: social dominance as indexed by resource control and perceived popularity. This latter construct refers to social prestige, influence, and visibility (Parkhurst & Hopmeyer, 1998). Bullying was included for reasons discussed above. To facilitate comparison with previous work assessing children's social functioning in the peer group, we tapped peer-rated social preference (likeability). In addition, expanding on previous work, we assessed enmity nominations. This latter variable was included to get an impression of the extent to which certain children who score low on social preference (e.g., coercives) strongly repel their peers.

The variables tapping social functioning are highly relevant for the age group examined. That is, in late childhood and early adolescence children attach great importance to the opinions and appraisals of peers, and are greatly concerned about inter-personal acceptance and status, more so than younger children (Harter, 2006). Moreover, peer difficulties are relatively common and salient in this period (Bierman, 2004).

In short, this study was designed to further our understanding of social dominance among preadolescent children, using RCT as a guiding framework. Of primary concern were differences between the five subtypes as defined in RCT, which were compared in terms of outcome variables (or correlates) over time. Importantly, contrary to previous work, we disentangled between strategy use as such and obtained resource control. With regard to gender, in RCT (e.g., Hawley, 2007) similarities between boys and girls are considered at least as important and pervasive as differences between them. However, gender differences in the use of strategies have been reported (Ostrov, Pilat, & Crick, 2006). Moreover, boys are more overtly aggressive than girls and more motivated to dominate peers (e.g., Block, 1983; Olweus, 1993). Hence, they may be more strongly inclined to engage in coercive strategies. Conversely, girls may be more likely to use prosocial strategies to access resources (e.g., Charlesworth & Dzur, 1987). Moreover, the link between strategy use and obtained resources may differ between both genders. We therefore examined the role of gender with regard to strategy use and the composition of the RCT subtypes.

We hypothesized that over time bistrategic children would show the highest levels of social dominance as indexed by resource control and perceived popularity whereas those scoring low on both strategies ('non-controllers') would consistently display the lowest levels of social dominance and reputational status. Moreover, we expected that over time high coercive strategy use (as displayed by coercive and bistrategic controllers) would be consistently and positively associated with bullying. We also examined to what extent non-controllers consistently experience more negative outcomes than their peers across domains. However, we hold no a priori hypotheses in this regard. Finally, we anticipated that bistrategics' mix of coercion and prosociality might also yield lower overall peer liking, and/or more enmity nominations.

2 | METHOD

2.1 | Participants

The sample consisted of 394 children (51.3% girls) from 12 elementary schools throughout The Netherlands. This was the youngest cohort of the cross-sectional Olthof et al. (2011) study. Children were tracked during their last 3 years at

elementary school. During this period, no school transition occurred. All participants were in fourth grade at Time 1 (2006). The nominating groups were about the same size throughout the study period. At Time 1, the nominating groups ranged from 12 to 30 children (mean = 21.9). Pupils came from a wide range of social backgrounds (low and working classes through upper middle class). Their mean age at Time 1 was 10.3 years (SD = 0.5). Parents received a letter in which the purposes and procedures of the study were explained. Of all parents, 4% did not provide consent (children's assent rate = 100%). This passive consent procedure was in line with the local ethical guidelines at the time of the data-collection (2006–2008). When informing participants about the aims and procedures of the study, they could choose not to participate, but no one did so. Most participants (83%) were native Dutch (Caucasian). Other children had at least one parent originating from Turkey, Morocco, Surinam, or an European country other than The Netherlands.

At Time 2 (2007) and Time 3 (2008), data were collected for 371 (51.2% girls) and 335 participants (52.2% girls), respectively (i.e., 94.2% and 85.0% of the initial sample). These yearly assessments occurred in the spring semester. Attrition was chiefly due to participants moving to other non-participating schools (16 children at Time 2, and 17 more children at Time 3). Other reasons for attrition were, among others, parental refusal, refusal of the child him/herself or the child being sick or otherwise absent when data were collected. Participants who did not participate at Time 2 and/ or Time 3 did not differ from those with complete data in terms of their scores on all variables at Time 1.

2.2 | Measures

2.2.1 | Resource control strategies: Coercive and prosocial strategy use

Strategy use was assessed with peer nominations. Six items were used to assess coercive strategy use (see Olthof et al., 2011). These items were adapted from Hawley (e.g., Hawley, 2003a, 2003b), and were translated from English into Dutch, with the help of a certified interpreter. Because we changed the wording of some of the items (see below), we did not use back translation procedures. The items were tested in a pilot study among both children and teachers.

Exemplar items were 'Which children in your class (1) ...try to get what they want by forcing others?; (2) ...try to get what they want by making others follow their plans?; (3) ...try to get others to do what they tell them to do, even if they don't really want to? (4) ...try to get what they want by acting in a bossy way?"

The content of the items diverged somewhat from those used by Hawley et al., in that we attempted to avoid that items would refer to both acting in a certain way and to the resources obtained by behaving in that way. For instance, an item that reads 'I access resources by X' (e.g., by doing or promising something in return) does not purely assess the use of strategy X, but rather taps both 'I access resources' and 'I do so by using strategy X'. If peers rate this statement low, it may be that they do not use the strategy, but it may also be that they do attempt to acquire resources by using X, but that this attempt is not successful. Moreover, to the extent that the strategy item 'the child accesses resources by X' encompasses the successful attainment of resources, a positive linkage between scores on this item and scores for resource control does not provide convincing support for the claim that the use of that strategy leads to resource control. In line with this reasoning, other researchers have also conceptualized and measured strategies as attempts to control resources, independently from the obtained resource control (Roseth et al., 2011; Sebanc, Pierce, Cheatham, & Gunnar, 2003).

For all items, participants could nominate an unlimited number of classmates (not grademates) who met the description. In their study examining peer sociometric nominations (i.e., 'like most' and 'like least') in sixth graders, Poulin and Dishion (2008) observed that for children confined to a stable classroom in which they mainly interact with their classmates and not much with other grademates (as in The Netherlands), restricting the voting population to classroom peers did not affect the predictive validity of the measure. We considered it likely that this would also apply to the measures in the present study. Moreover, Bukowski, Cillessen, and Velasquez (2012) assert that the reference group for elementary school children typically is the classroom.

Participants could nominate classmates who did not participate, but these data were not used further. To control for differences in class size, continuous scores were then computed for each item by dividing the number of received nominations by the number of participating classmates minus 1 (the child him/herself). These proportion scores were

averaged, yielding a total peer-nominated score for coercive strategy use (Olthof et al., 2011). At all assessment points, Cronbach's alpha exceeded .80. To correct for differences between classes in terms of how children report on each other's behavior and following procedures that other researchers have used to derive dependent measures from often skewed peer nomination variables (Hawley, 2003a; Salmivalli & Voeten, 2004), these scores were standardized and normalized within class using the SPSS Rankit procedure. This transformation was also applied to the other peer-nominated variables discussed below.

Prosocial strategy use was assessed with five items (see Olthof et al., 2011), which were also adapted from Hawley and colleagues and reworded as outlined above. Some exemplar items were 'Which children in your class (1) . . .act nicely in order to try to get what they want?; (2) . . .go over and help other children (even if they don't really need it) in order to try to get what they want?' (3) . . .promise to invite other children to get what they want? They say for example: 'You can come and play with me at home', or they say 'Then I will invite you to my birthday party'.

A similar approach as described above for coercive strategy use was applied for prosocial strategy use. For these scores, Cronbach's alpha exceeded .80 at all assessment points.

2.2.2 | Resource control

Teachers rated participants on six items on a scale ranging from 0 (never or almost never) to 4 (very often). The items were adapted from Hawley's procedures to index teacher-reported resource control. Some specific items were: To what extent (1) . . . is this child usually at the center of attention in a group of children?; (2) . . .does this child usually get what she wants?; (3) . . .does this child usually get first hold of the nicest toys or the best gadgets? The ratings were averaged to yield a measure of teacher-reported resource control. Coefficient alpha of the scale exceeded .85 at all assessment points, and inter-correlations between the items ranged from .78 to .83. To take differences between teachers into account, and to correct for the non-normal distribution of scores, they were transformed into normalized scores using the SPSS Rankit procedure.

2.2.3 | Perceived popularity

Perceived popularity was indexed by having participants nominate both popular and unpopular classmates. Following other researchers (e.g., Parkhurst & Hopmeyer, 1998), these terms were not defined. Instead, participants were informed that 'in every class some children are very popular, whereas other children are not popular'. They were then asked 'Which children in your class are popular?' and 'Which children in your class are not popular?' Scores were calculated within classrooms as the standardized difference between the standardized number of popular votes and the standardized number of unpopular votes (see LaFontana & Cillessen, 2002).

2.2.4 | Bullying

To assess bullying, the bullying role nomination procedure (Olthof et al., 2011; Reijntjes et al., 2013) was used. This measure taps five distinct forms of bullying, including physical (e.g., pushing, kicking), property-attacks (e.g., damaging personal property of peers), verbal (e.g., calling names), direct relational (e.g., excluding someone), and indirect relational (e.g., gossiping). Participants were read an elaborate description of the concept, in which its three core features were explained: intent to harm, recurrence over time, and a noticeable power difference between perpetrator and victim (Salmivalli & Peets, 2009).

Subsequently, nominations were obtained for the five different types of bullying. Continuous scores were then computed within classrooms by dividing the total number of nominations by the number of nominators minus 1 (see Olthof et al., 2011). Previous work (e.g., Pronk, Olthof, & Goossens, 2015) has provided support for the validity of the instrument. Given that the pattern of findings with respect to bullying (i.e., RCT subgroup differences; boys scoring higher than girls on all types) did not differ between the specific bullying types, and Cronbach's alpha for boys and girls being above .75 at all assessment points, a total bullying score was calculated by averaging the five scores (see Reijntjes et al., 2013 for a similar approach). Scores were then transformed within classes using the SPSS Rankit procedure.

2.2.5 | Enmity nominations

Children were told that 'Some children do not get along with each other at all. They often quarrel. They cannot co-operate and they will never help each other. You could say these children are enemies. They do not like each other; they rather detest each other. Which children in this class do you detest yourself?' Enmity scores were computed as described above for bullying scores.

2.2.6 | Peer-reported social preference

The sociometric status rating (SSRat) procedure was used (Maassen, Akkermans, & Van der Linden, 1996). Specifically, participants rated their classmates on a 7-point scale ranging from −3 (*very dislikeable*) to 3 (*very likeable*), with 0 being the neutral midpoint. Overall social preference was calculated by averaging all received ratings.

2.3 | Procedure

Each of the 3 years, participants, peers, and teachers provided data. Teachers rated participants' resource control at their own convenience. The peer reports were collected in two sessions that lasted approximately 30 min each. Children were interviewed individually by a research assistant, in an empty classroom. To control for potential interviewer effects, research assistants were trained at length, and standardized interviews were administered using a laptop. Children received a list of their classmates for the peer nominations, could nominate as many peers as they wanted, could nominate both genders, and could answer 'nobody' if no peer fit the description (see Bukowski et al., 2012).

3 | RESULTS

3.1 | Analytic strategy

For the descriptive analyses, which focused on differences over time and gender differences, we used repeated measures ANOVAs for all variables, with gender serving as the between subjects factor. Next, we followed the RCT approach to assign children to one of the five a priori defined resource control subgroups (e.g., Hawley, 2003a, 2003b). Toward this aim, we first calculated the 33rd and 66th percentile scores for both prosocial and coercive strategy use as reported by peers. Specifically, *prosocial controllers* were those who scored above the 66th percentile on prosocial strategy use and below the 66th percentile on coercive strategy use, *coercive controllers* scored above the 66th percentile on coercive strategy use and below the 66th percentile on prosocial strategy use, *bistrategic controllers* scored above the 66th percentile on coercive and prosocial strategy use, *non-controllers* scored below the 33rd percentile on coercive and prosocial strategy use, and *typicals* scored below the 66th percentile on both coercive and prosocial strategy use, but above the 33rd percentile on at least one type of strategy use.

Given the relatively high stability of strategy scores (correlations for adjacent time points ranged from .51 to .66; $ps < .001$) and to increase the reliability of the classification, children were classified based on their averaged strategy use over time (as opposed to their strategy use at Time 1 only). Next, we performed multiple group linear growth model analyses for all variables of interest (e.g., resource control). Unfortunately, the fit of these models was poor for most variables. For instance, for bullying the following figures were observed: Chi square (20) = 589.6, $p < .001$; RMSEA = 0.60; CFI = 0.006, and SRMR = .42. For resource control, these figures were Chi square (20) = 277.2, $p < .001$; RMSEA = 0.41; CFI = 0.016, and SRMR = .31.

Moreover, for most variables changes over time were negligible (none of the linear slopes were significant), and for all variables the magnitude of change over time did not differ between subgroups. Subsequent analyses revealed that subgroup comparisons in terms of variables averaged over the three assessment waves yielded an almost identical pattern of findings. It thus appears that growth models were not really needed. Because children were classified based on their averaged strategy scores over time, for the subsequent subgroup comparisons we also used averaged scores over the three assessment points.

TABLE 1 Means and standard deviations for all variables by gender

Measure	Range	Boys		Girls		Total	
		Mean	SD	Mean	SD	Mean	SD
Prosocial strategy use[a]							
Wave 1	−2.07 to +2.13	.03	.88	.05	.99	.04	.93
Wave 2	−1.77 to +2.13	.04	.86	.09	.88	.07	.87
Wave 3	−1.47 to +2.11	−.03	.91	.03	.88	.01	.89
Coercive strategy use[a]							
Wave 1	−2.07 to +2.13	.24	.93	−.21	.86	.01	.92
Wave 2	−1.69 to + 2.13	.11	.95	.03	.82	.07	.88
Wave 3	−1.82 to + 2.11	.18	.92	−.08	.83	.05	.88
Resource control[a]							
Wave 1	−2.10 to + 2.10	.08	.95	−.06	.92	.01	.94
Wave 2	−2.13 to + 2.11	.04	1.01	.04	.89	.04	.95
Wave 3	−2.17 to + 2.09	.001	.97	−.08	.89	−.04	.93
Bullying[a]							
Wave 1	−2.02 to + 2.13	.37	.95	−.32	.77	.01	.93
Wave 2	−1.56 to + 2.13	.33	.94	−.22	.79	.05	.91
Wave 3	−1.82 to + 2.11	.31	.99	−.24	.73	.03	.91
Perceived popularity[a]							
Wave 1	−2.62 to +2.91	.08	1.05	−.08	.95	.01	.96
Wave 2	−3.83 to +3.60	.07	1.03	−.08	.97	−.01	1.00
Wave 3	−2.43 to +2.55	.03	1.11	−.07	.92	−.02	1.02
Peer-reported social preference[b]							
Wave 1	−2.37 to + 2.25	0.48	.72	.81	.61	0.65	.68
Wave 2	−2.40 to + 2.73	0.42	1.11	0.73	1.02	0.58	1.08
Wave 3	−1.90 to + 2.56	0.65	.68	0.89	.62	0.77	.66
Enmity nominations[a]							
Wave 1	−1.15 to + 2.10	.19	.88	−.05	.84	.07	.87
Wave 2	−1.47 to + 2.13	.17	.91	−.04	.82	.07	.87
Wave 3	−1.31 to + 2.11	.17	.91	.03	.91	.10	.91

[a]Standardized scores.
[b]Mean scores.

Subgroup comparisons were then conducted using ANOVAs for the five variables of interest, with subgroup and gender serving as the two between subject factors. The interaction between these two factors was also included. Significant overall effects were followed up with post hoc tests using Tukey's HSD to determine which groups differ. Given the relatively large number of tests, alpha was set at .01 for each of the ANOVAs.

3.2 | Preliminary analyses

Table 1 displays the means and standard deviations for all variables at the three assessment points, for the total sample and for boys and girls separately. Averaged over all assessment waves, the percentage of missing data varied from 6.0% for peer-reported social preference to 20.4% for enmity nominations. Missing data were partly due to students moving to other schools. Also, some classrooms did not provide peer nomination data due to administrative errors, or miscommunication between researchers and teachers.

Averaged over all variables and the three assessment waves, the percentage of missing data was 15.5%. Missing data were dealt with using multiple imputation (MI, Rubin, 1987). With MI, each missing datum is imputed $m \geq 2$ times, resulting in m different but complete datasets. The m datasets are then analyzed by standard procedures and the resulting analyses are combined into a single inference.

TABLE 2 Number of participants and gender composition of the five resource control subgroups

Resource control subgroup	N	Boys (%)	Girls (%)
Bistrategics	103	55.3	44.7
Coercives	30	73.3	26.7
Prosocials	32	21.9	78.1
Typicals	137	46.7	53.3
Non-controllers	92	46.7	53.3

All imputations have been obtained with package MICE (Van Buuren & Groothuis-Oudshoorn, 2011; version 2.25) in R, with 20 iterations for the algorithm to converge and 10 multiple imputed data sets. The outcomes over the 10 data sets were combined into a single inference using Rubin's rules (Rubin, 1987).

Scores for most variables were stable over time (see Table 1). However, for peer-reported use of coercive strategies, a significant time by gender interaction effect emerged, $F(2, 391) = 11.97$, $p < .001$, $\eta_p^2 = .06$. Follow up post hoc analyses revealed that for boys scores decreased from Time 1 to Time 2 ($p < .02$) whereas for girls scores increased from Time 1 to Time 2 ($p < .001$). For both genders, scores did not change from Time 2 to Time 3. Moreover, a significant gender effect for coercive strategy scores over time was found: $F(1, 392) = 10.10$; $p < .003$, $\eta_p^2 = .025$. As depicted in Table 1, girls scored consistently lower than did boys.

In addition, for both bullying and enmity nominations, main effects for gender were obtained. For bullying, $F(1, 392) = 59.15$, $p < .001$, $\eta_p^2 = .13$, and for enmity nominations, $F(1, 392) = 16.61$, $p < .001$, $\eta_p^2 = .04$. In both instances, boys scored consistently higher than girls. Finally, for peer reported social acceptance, a significant main effect for time emerged: $F(2, 391) = 11.06$, $p < .001$, $\eta_p^2 = .05$. Post hoc analyses revealed that scores for both genders increased from Time 1 to Time 2, but remained stable from Time 2 to Time 3. Moreover, a main effect for gender was found, $F(1, 392) = 19.46$, $p < .001$, $\eta_p^2 = .05$, indicating that girls consistently received higher social acceptance scores than boys. At all assessment points, for both genders prosocial and coercive strategy use were substantially correlated (range .61 to .69; $ps < .001$).

3.3 | Subtypes based on patterns of strategy use

For each of the five subgroups that were created, Table 2 displays the number of participants and gender breakdown. As can be seen, the typicals were the largest group, while both the coercive and prosocial subgroups were relatively small. Boys were overrepresented in the coercive group, and underrepresented in the prosocial group; Chi square $(4) = 18.55$; $p < .002$.

3.4 | Comparisons between subtypes

3.4.1 | Resource control

A main effect for subgroup was observed: $F(4, 384) = 42.97$, $p < .001$, $\eta_p^2 = 0.31$. No gender effect emerged. Post hoc follow up analyses comparing subgroups revealed that scores were highest for bistrategics, which were higher than those observed for prosocials and typicals, who did not differ from each other (the p value for the difference between bistrategics and coercives was .07). In turn, non-controllers showed lowest scores, significantly lower than all other groups (see Table 3).

3.4.2 | Perceived popularity

The subgroups' scores differed significantly $F(4, 384) = 33.94$, $p < .001$, $\eta_p^2 = .26$. No gender differences emerged. Follow up analyses showed that bistrategics' scores were highest, and significantly exceeded those of all other subgroups,

TABLE 3 Means and standard deviations of correlate scores for the five subgroups

Measure	Resource control	Perceived Popularity	Bullying	Enmity Scores	Peer-Reported Social Preference
Bistrategics	0.66$_a$ (0.64)	0.72$_a$ (0.94)	0.93$_a$ (0.61)	0.59$_a$ (0.70)	0.43$_a$ (0.69)
Coercives	0.24$_{a,b}$ (0.54)	0.24$_{a,b}$ (0.78)	0.83$_a$ (0.54)	0.19$_{a,b}$(0.55)	0.69$_{a,b}$ (0.53)
Prosocials	0.05$_{b,c}$ (0.69)	−0.07$_{b,c}$ (0.77)	−0.13$_b$ (0.60)	0.16$_b$ (0.67)	0.79$_{a,b,c}$(0.51)
Typicals	−0.16$_{b,c}$(0.66)	−0.22$_{b,c}$ (0.66)	−0.26$_b$ (0.55)	−0.08$_b$ (0.60)	0.82$_{b,c}$ (0.48)
Non-controllers	−0.55$_d$ (0.65)	−0.49$_c$ (0.76)	−0.65$_c$ (0.44)	−0.40$_c$ (0.40)	0.98$_c$ (0.46)

Note. Means within columns which have at least one letter in common in their subscripts do not differ significantly from one another at $p < .01$.

except the coercives. Scores for non-controllers were lowest, although not significantly lower than the scores of typicals and prosocials.

3.4.3 | Bullying

A significant effect of group emerged, $F(4, 384) = 149.18$, $p < .001$, $\eta_p^2 = .61$. A main effect for gender was also identified, $F(1, 384) = 58.75$, $p < .001$, $\eta_p^2 = .13$. Not surprisingly, boys engaged in more bullying than did girls ($M = .36$, $SD = .88$ and $M = −.25$, $SD = .67$, respectively). Post hoc follow up analyses revealed that bistrategics and coercives obtained the highest scores for bullying, and the non-controllers the lowest. Non-controllers scored significantly lower than all other groups whereas prosocials and typicals scored lower than the bistrategics and coercives (see Table 3), but did not differ from each other.

3.4.4 | Enmity nominations

A main effect for subgroup was found, $F(4, 384) = 36.74$, $p < .001$, $\eta_p^2 = .28$. Post hoc analyses showed that bistrategics received highest scores. These scores significantly exceeded those of all other groups, except the coercives (although p approached .01 ($p = .012$). Scores for non-controllers were lower than the scores for all other groups. Moreover, boys ($M = .20$, $SD = .70$) received more nominations than girls ($M = −.08$, $SD = .66$); $F(1, 384) = 8.54$, $p < .005$, $\eta_p^2 = .04$.

3.4.5 | Peer-reported social preference

Girls received higher scores than boys ($M = 3.87$, $SD = .52$ and $M = 3.61$, $SD = .61$, respectively); $F(1, 384) = 10.17$, $p < .001$, $\eta_p^2 = .03$. The analysis also showed a significant effect for subgroup: $F(4, 384) = 12.94$, $p < .001$, $\eta_p^2 = .12$. Follow up analyses revealed (see Table 3) that bistrategics received lowest scores (albeit not significantly lower than coercives and prosocials), which were significantly exceeded by those of the typicals and the non-controllers. These latter two groups did not differ.

4 | DISCUSSION

The present multi-informant study was designed to further our knowledge of the characteristics of resource control subtypes based on patterns of strategy use and their differences. Quite remarkably, few developmental changes were observed for children's use of resource control strategies, their linkages with resource control, and several social correlates. In fact, the role of age-related changes was minimal.

A likely explanation for this result is that change was relatively small because during the study period participants had presumably already formed well-established groups, and many classmates had been together for years before they were examined during the last 3 years of primary school. It seems plausible that in such existing groups the social hierarchy is well-ingrained and relatively stable. If so, small changes in the variables under investigation are not very

surprising. Future research on the role of age should investigate the development of these linkages in newly formed groups. For instance, upon the transition from primary to secondary school, children have to gain their social status again in a new environment. To achieve that goal, resource control strategies are likely to be used strategically, and changes over time are more likely to occur.

As expected, we found clear support for the claim of RCT that higher usage of both dominance-oriented strategies simultaneously is associated with more successful attainment of resources. Specifically, the bistrategic children were perceived by their teachers as the most effective resource controllers and by their peers as highest in perceived popularity (although not significantly higher than coercives). Conversely, also in line with RCT and previous findings, lowest scores for both resource control and perceived popularity were found for the non-controllers.

Although not always more well-liked than the other RCT subgroups (Hawley, 2003a), Hawley and colleagues have asserted that bistrategics, because of their high status, attract positive attention and are sought out by their peers as alliance partners and mates (Hawley, 2014). Noteworthy, in the present study bistrategics were the least liked in the peer group at large. Also, contrary to Hawley's assertion that 'bistrategic children are liked by peers in part because they possess social skills that mitigate the negative effect of aggressive behavior' (Hawley et al., 2007, p. 171), these bistrategic children were often nominated as enemies by their classmates, significantly more so than prosocials, typicals, and non-controllers. Taken together, bistrategic children appeared to be somewhat repulsive to many of their peers.

The present findings also showed that bistrategic children engaged in significantly more bullying than prosocials, typicals, and non-controllers (and as much as coercives). Hence, contrary to Hawley's expectations (Hawley et al., 2010) it appears that in their quest for resource control ('getting ahead'), bistrategics use coercive strategies that include not only threats and manipulation, but also the sustained and repeated harassment of their peers. It seems likely that this behavior is one reason for their relatively low overall peer acceptance.

What may account for the more negative characteristics of the bistrategics observed in the present research, relative to previous findings for these children? One explanation may be that Hawley and colleagues (e.g., Hawley, 2003a) tend to measure peer social acceptance by only tapping how much a child is liked (e.g., 'Who do you like the most?'; 'Who do you like to hang out with?') as opposed to also including social rejection by indexing both being liked and being disliked, as is more common in the peer relations field (Bukowski et al., 2012). Another possibility is that in the studies of Hawley and colleagues, bistrategics were identified using strategy items that did not always disentangle strategy use as such from the resulting resource control. Consequently, the bistrategics in their studies may have been more likely to exclusively consist of socially savvy children who successfully used strategies to obtain resources whereas the bistrategics in the present work presumably also included some children who were less successful in acquiring resources, despite their high scores for resource-oriented strategies. It seems likely that these latter children were lower in social skills/intelligence, less proficient with respect to the targeting and timing of strategy use, evoke more aversion, and thus were more disliked.

Interestingly, the present work challenges the view that non-controllers should be considered as somewhat pitiful individuals, who are not only unsuccessful in the competition for resources with their peers, but also high in psychological problems and rejected or neglected by peers (e.g., Hawley, 2003a,2007). Although this group scored lowest on both resource control and perceived popularity, they enjoyed similar levels of peer-reported social acceptance as the other groups and received the fewest enemy nominations of all groups.

Our findings may have implications for interventions. Specifically, interventions should target those who primarily or exclusively rely on coercive strategies. To balance their shortcomings, these children should be taught the necessary skills (e.g., negotiating, dealing with conflict in a more peaceful fashion) to also engage in prosocial strategies when trying to obtain resources (Green & Rechis, 2006). Moreover, given that bistrategics and coercives engage in high levels of bullying, this study underscores the need for interventions reducing this unwanted behavior. Because bullying only leads to dominance and resources if it is reinforced by the peer group, intervention is most likely to be successful when the peer group is used to deprive bullies of their motivation to engage in bullying by reducing the rewards for bullying (Kärnä et al., 2011).

Like all studies, the present work has limitations. Firstly, our findings are collected among primarily Caucasian early adolescents. To examine generalizability, future studies should include youth from a broader age range, as well as different ethnic backgrounds. Moreover, future longitudinal work may examine the (in)stability of dominance rankings—in particular when the peer group changes—and the factors governing this (in)stability. Secondly, non-experimental studies do not permit strong causal inferences. It may be that the observed linkages are not independent of variables such as physical appearance or social skills. At this point, it should be noted that, based on theoretical considerations, RCT, a priori, creates five different resource control types, using arbitrary cut-off points. Although this approach has face validity, it seems important to examine whether similar groups emerge when an empirical approach is used that does not a priori assume these different groups. Third, for the specific bullying forms assessed, gender differences were similar (i.e., boys scored higher on all forms), and bullying scores were therefore collapsed to an overall score. However, as noted, the use of dominance strategies and aggression forms may differ between boys and girls. Hence, future work should examine to what extent this pattern of findings with regard to gender differences is replicated in different samples, when specific forms of bullying are examined separately. Fourth, our study did not examine the role of context (e.g., differences between teachers valuing cooperation vs. competition). Future work should examine the context specificity of social dominance. For instance, it would be interesting to know to what extent a socially dominant child in primary school is also dominant in a setting where rules for negotiating and interacting with others are slightly different (e.g., his/her football club), or another setting in which group members are slightly older or younger (e.g., his/her day care centre).

Notwithstanding these limitations, the present research extends our knowledge of RCT and social dominance in youth in several important ways. Firstly, several findings suggest that the way resource control strategies are assessed (i.e., distinguishing between strategy use and resulting resources or not) may substantially affect both the identification of resource control subtypes as well as their correlates. At this point, it should be reiterated that conceptually RCT clearly makes this distinction. We therefore consider the present study as an examination of the merits of RCT, as opposed to testing an alternative conceptualization. Secondly, consistent with RCT, bistrategic children scored highest on both teacher-rated resource control and perceived popularity. However, contrary to Hawley's (2007) assertion that bistrategic children are proficient in balancing 'getting ahead' with 'getting along', their behavior, including high levels of bullying, appears to evoke clear negative reactions in the peer group at large. Finally, the present results do not indicate that non-controllers experience more negative outcomes across all domains. Taken together, it appears that although bistrategics are most successful in 'getting ahead', non-controllers are most proficient in 'getting along'.

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