Social dominance and prosocial and coercive strategies of resource control in preschoolers

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This study was designed to investigate the predictors of social dominance, the strategies children use to control resources (prosocial and coercive), and the associations between these strategies and measures of personality, social skills, and peer regard. A total of 30 preschoolers (ages 3–6) were rated by their teachers on social dominance. Based on these ratings, dominant children were paired with multiple subordinate children (i.e., block design; Kenny, 1990) and observed in a play situation designed to elicit resource control behaviour. As hypothesised, age and the surgency facet of extraversion predicted social dominance (but openness to experience did not). Furthermore, also as expected, both prosocial behaviour and coercive behaviour were related to resource control in the play situation. Last, both resource control strategies were associated with parent-rated social competence, but only coercive control was associated with positive peer regard (i.e., Likeability). Factors of personality (e.g., agreeableness, hostility) were not associated with either of the strategies. The utility of an evolutionary perspective to resource control and social competence is discussed.

After twenty-five years of scholarly work on children’s peer relationships and social adaptation (Rubin, Bukowski, & Parker, 1998), it is now well-established that children who are competent with peers, that is, children who can form and maintain positive associations with others (Hartup, 1983), enjoy favourable developmental outcomes not enjoyed by those who fail at these basic developmental tasks (Berndt, 1996; Bukowski, Newcomb, & Hartup, 1996; Parker & Asher, 1987).

Social competence, rather than being a measurable behaviour, is best considered a general class of phenomena (Bukowski, Rubin, & Parker, 2001). Some perspectives maintain that social competence involves being able and motivated to perceive and flexibly respond to the often complex demands and opportunities afforded by social situations (Waters & Sroufe, 1983), and generally balancing well the goals of the self and others (Bost, Vaughn, Washington, Cicinska, & Bradbard, 1998; Rubin & Rose-Krasnor, 1992; Weinstein, 1969). Despite the variability in specifics, nearly all approaches to social competence imply a balance between agency (e.g., personal achievement) and communion (e.g., forming social unions; Bakan, 1966). In other words, the socially competent child is able to achieve personal goals in social situations while simultaneously maintaining positive relationships (Rubin & Rose-Krasnor, 1992). From this viewpoint, the aggressive child may achieve personal goals, but the aggressive strategy is assumed to obstruct positive relationships.

Underlying many approaches to social competence are prosociality and agreeableness on the one hand and aggression and hostility on the other. Research suggests that the socially competent individual expresses positive affect, responds to others’ overtures, is agreeable and sympathetic (e.g., Attia, 1990; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992), and, as a result, is liked by others (Newcomb, Bukowski, & Partee, 1993). Individuals lacking social competence are, among other things, aggressive, unable to delay gratification, hostile (e.g., Chung & Asher, 1986; Dodge, Murphy, & Buchsbaum, 1984), and tend to be disliked as a consequence (Coe & Gillessen, 1993; Newcomb et al., 1993; but see Farmer & Rodkin, 1996).

Increasingly cited, however, is that this bipolar view may be an oversimplification (e.g., Bukowski et al., 2001). For example, popular children are those judged to be the most socially competent as a group. Yet they do not differ on some measures of aggression from other status groups although they tend to be less disruptive (Newcomb et al., 1993). It may be that aggression is not wholly incompatible with social competence. Aggressive behaviour in preschoolers attending Head Start, for example, has been associated with several measures of social competence (i.e., received visual attention, Q-sort social competence ratings, and peer regard; Bost et al., 1996; Vollenweider, Vaughn, Azria, Bost, & Krzyw, 2000).

Entertained here is the possibility that aggression—in the service of social dominance—may be a characteristic of socially competent individuals. That is, socially dominant individuals may be perceived as socially competent, even if they use coercive means to achieve their goals.

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Social dominance and social competence

The empirical work with children by the ethologists not only has shown that dominance hierarchies based on aggression are evident as early as toddlerhood (Hawley & Little, 1999; Russon & Waite, 1991) and the preschool years (McGrew, 1972; Strayer & Strayer, 1976), but also that social dominance is associated with indices consistent with social competence (Bost et al., 1998). For example, socially dominant toddlers and preschoolers are looked at more by peers (Hawley & Little, 1999, Vaughn & Waters, 1981), are attractive social partners (LaFreniere & Charlesworth, 1983; Strayer & Trudel, 1984), and are preferred models of imitation (Abramovitch & Grusec, 1978, Hawley & Little, 1999). The assumption that social dominance has evolutionary foundations is central to the ethological perspective; theoretically, socially dominant individuals enjoy advantages that impact differential reproduction of a genetic line in the long term (Betzig, 1986; Strayer & Trudel, 1984).

The positive association between social dominance and social competence, however, appears to reduce and eventually reverse as aggression and coercion become less and less tolerable to adults and the social group as children get older (see Hawley, 1999a for review). Several well-known lines of inquiry have shown that aggressive behaviour forebodes significant maladaptation in the short and long term as well as peer censure (Cole & Dodge, 1983; Newcomb et al., 1993). This changing relationship lies at the core of a quandary surrounding the social dominance construct as traditionally defined (i.e., by aggression). If social dominance is adaptive in the evolutionary (ultimate) sense, then why is it associated with behaviour that is maladaptive in the psychological (proximate) sense?

Shifting from the traditional view of social dominance

This quandary lies at the heart of the unique perspective adopted here. Namely, the apparent paradox created by linking socially maladaptive behaviour with evolutionary adaptation can be resolved by shifting attention away from the traditional aggression-based social dominance (e.g., Bernstein, 1981; McGrew, 1972; Strayer & Strayer, 1976) and focusing on the outcome of the aggression (i.e., resource control). This refocusing on the ends naturally raises questions concerning the means, or the strategies individuals employ to control resources (Hawley, 1999a; see also Charlesworth, 1988, 1996). From this perspective, socially dominant individuals are those who successfully control resources in the presence of others regardless of how they do so. This shift from a structural to a functional approach (Hawley, 1999b) has considerable implications for the questions that are asked and the ways in which they are pursued.

For example, we can ask, “what are the predictors of resource control?” Social dominance describes an asymmetry between individuals in their relative competitive abilities. As such, it is highly context-dependent; an individual cannot be described as being more or less socially dominant without reference to at least one other individual (Bernstein, 1981; Hawley & Little, 1999). Importantly, individuals vary in their resource-directed behaviour and are not equal in their abilities and/or motivation to pursue resources in the presence of others. Because social dominance has been shown to be a central organising feature of social groups with implications for other aspects of social functioning (e.g., Strayer & Trudel, 1984), it is important to know the factors relating to an individual’s relative success or failure at competition for resources in the social group. For toddlers, mental age, temperament persistence, and experience in the social group all appear to play important roles (Hawley & Little, 1999).

Additionally, we can ask, “what strategies do individuals employ to control resources?”. In addition to considering instrumentally aggressive behaviour as a resource control strategy (monopolising, threatening, assaulting), prosocial behaviour may serve as a resource control strategy as well (reciprocation, alliance formation, cooperation). Such a view has long been held in the field of theoretical biology (e.g., Kropotkin, 1902; Tivors, 1971), has more recently influenced studies of animal behaviour (e.g., Chapais, 1992), but has been adopted by relatively few child development researchers (e.g., LaFreniere & Charlesworth, 1983, 1987; Hawley, 1999b; Hawley, Little, & Pasupathi, 2000). For example, not only do children access toys by commanding, pushing, and pulling (coercion), but also do so by issuing invitations and requests, and making offers (LaFreniere & Charlesworth, 1987).

Developmentalists typically do not consider prosocial behaviour to be functionally competitive because prosocial behaviour by definition involves voluntary actions that benefit others (e.g., helping, sharing, cooperating; Eisenberg & Mussen, 1989; Zahn-Waxler & Smith, 1992). At the same time, many conducting research in this domain do not rule out that such behaviour can have multiple motivations underlying it, including motivations that involve serving the self (e.g., Eisenberg, 1996; Eisenberg & Giallanza, 1984). Indeed, others from several fields of psychology have shown that aiding or instructing others can be an effective and socially acceptable way of achieving one’s own goals (Sparmann & Oswald, 1988; McClelland, 1975; Winter, 1992).

Reconciling social competence and social dominance

This orientation that integrates broad biological principles and cross-species behaviour comparisons suggests a link between resource control (i.e., social dominance) and social competence. White (1959) argued in his seminal paper that an orientation to the environment, the desire to interact with it, change it, and control it are central features of competitiveness shared by many species. Attachment theory addresses similar themes by linking key social relationships with the desire and ability to explore the environment (Ainsworth, 1969; Waters & Sroufe, 1983). Furthermore, ethologists and animal behaviourists have argued and shown that socially dominant individuals are valued and sought after group members (e.g., Chance, 1967). These diverse lines of work suggest that: (a) we are disposed to go forth and explore/control aspects of the environment for our own best interests, and (b) other group members approve of and gravitate toward individuals who are successful at doing so.

As discussed above, the social competence literature suggests that successful individuals achieve personal goals while maintaining positive relationships. The social dominance literature suggests that resource control is a central personal goal and that although aggression and coercion may be one means to attain these goals, the theoretical biology literature suggests that prosociality may also be a means to this end. The
social dominance literature furthermore suggests that successful resource controllers enjoy social attention that noncontrollers do not. In several species, socially dominant individuals are sought after by social partners and are watched and imitated by others (i.e., they are evaluated positively), yet they are also often aggressive. The integration of these literatures suggests that there may be positive relationships among resource control, prosociality, coercion, and indices of social competence. The purpose of the current study is to explore whether this is the case for young children.

Study questions
First, what predicts social dominance (relative ability to prevail in competition for resources) in three- to six-year-old children? Resource control should be related to relative ability factors, such as chronological age, as well as aspects of personality related to a willingness to engage the environment (i.e., the surgency facet of extraversion) and intellectance (Hogan & Hogan, 1991). Gender is not expected to predict social dominance, nor is physical size over the expected effects of age. Size and gender may be expected to be important from the traditional approach to social dominance (i.e., predicting aggressive behaviour), but because multiple strategies are considered here, these variables are not expected to play decisive roles.

Second, are there relationships among coercion, prosociality, and resource control? The functional evolutionary perspective suggests that behaviours traditionally associated with an other-orientation will be associated with resource control. Making suggestions, helping, offering objects, and verbally misleading (e.g., coaxing the partner toward an alternative resource in a friendly manner) are expected to be positively correlated with resource control, as will be coercive behaviours such as taking, thwarting, insulting, and aggression. Because prosocial strategies are presumed to be emerging at this age, the two strategies are expected to be correlated (i.e., the strategies are yet undifferentiated; Hawley, 1999a).

Third, are prosocial strategies and coercive strategies associated with or differentially associated with aspects of personality (e.g., agreeableness, conscientiousness, hostility), social skills (e.g., recognising how they make others feel, social competence), and peer regard (e.g., being liked)? Common sense would suggest that prosocial strategies, like prosocial behaviour in general, would be positively related to agreeableness and negatively related to hostility, whereas the reverse would be true for coercive strategies (e.g., Eisenberg & Fabes, 1998). Furthermore, the two strategy types might reasonably have a similar distinct pattern of association with conscientiousness given the lack of impulse control of aggressive children and socially competent children’s ability to delay gratification (Eisenberg & Fabes, 1998; Eisenberg & Mussen, 1989). This line of reasoning could be extended to social skills in general and peer regard (e.g., Newcomb et al., 1993). However, the hypothesised positive correlation between coercion and prosociality (i.e., lack of discriminant validity) should obscure the relationships with covariates that have been found in older children (like differentiating concepts in general; Detterman & Daniel, 1989). For this reason, prosocial and coercive strategies should not be differentially related to these measures in this age group.

Method
Participants
A total of 30 children (ages 3.9 to 6.9 years; mean = 5.5; 15 girls, 15 boys) enrolled in the Max Planck Institute-affiliated day care facility participated in the study. The girls (M = 5.49 years, SD = 0.88) did not differ in age from the boys (M = 5.50 years, SD = 0.84; p = .96). Although the day care centre is associated with the Max Planck Society, it serves the local middle class Berlin community. Nearly all of the children were of German ethnic heritage (29 of the 30 children had at least one German parent).

Not all children at the day care centre participated in the study. Based on the caretakers’ assessments of dominance status (see below), 10 children were selected from each playgroup (each being composed of 15 children); the 5 most socially dominant children (i.e., ranks 1–5) and 5 randomly selected children from the remaining 10 (i.e., nondominant children or subordinates). The subgroups selected from each care group did not differ from each other in age (M = 5.8 years, SD = 0.85; M = 5.3 years, SD = 0.49; M = 5.4 years, SD = 1.1; p = .35).

Procedures and measures
Block design. Each dominant child was observed with each subordinate peer that were selected from within his/her peer group (i.e., familiar peers). That is, five dominants from each group were observed with five subordinates from each group (i.e., a block design of the social relations approach; Kenny, 1990). This condition yields 25 dyadic interactions for each group for a total of 75 dyadic interactions across all three groups. Three of the 75 possible dyads were not observed, however, due to unsystematic absenteeism. Eighteen of the dyads were composed of two girls, 17 were composed of two boys, and 37 were composed of a girl and a boy.

The individual as the unit of analysis. Each child was observed for a total of 25 minutes. Because behaviour is partly due to stable personal characteristics and partly due to immediate contextual factors (Kenny, 1990), the five observation occasions were aggregated in order to derive an index emphasising a child’s behavioural tendencies across partner specificity. Aggregating over the five 5-minute observation occasions yields a more reliable indicator of behaviour than any single occasion (Epstein, 1980; Rushton, Brainerd, & Pressley, 1983) and minimises the effect of dependency at the level of the individual characteristic of methods based on dyadic interactions (Gonzalez & Griffin, 1997). Even though 72 dyads were observed, methods designed to explore dyadic level phenomena (e.g., Hawley & Little, 1999; Maguire, 1999) are not appropriate here because the questions posed concern individuals rather than relationships.

Social dominance. To obtain an independently derived measure of social dominance, the caretakers were asked to rate the children’s relative dominance standings (i.e., relative success at controlling resources and prevailing in disputes) within his/her playgroup. First, each of the three caretakers was asked to create a linear ranking of the children in her own group according to who typically wins disputes and controls resources in the presence of others. The results of this assessment were
three independent rank orderings ranging from 1 to 15 (i.e., one for each of the play groups) and formed the basis of participant selection (see above). Second, the caretakers were asked to complete a four item 5-point scale designed to assess the children’s relative frequency (i.e., almost always, often, sometimes, seldom, almost never) of prevailing in various contexts (i.e., outdoor play, indoor play, table-based activities, group activities). The responses to these two indices were standardised and averaged to create an overall social dominance score for each child, hereafter called “dominance status”.

Size. Height and weight were measured for all participants. These variables were standardised and then averaged to create the variable Size which was used in the analyses.

Personality. The parents of each child completed a questionnaire concerning their child’s behaviour and personality (Little & Wanner, 1999, based on John, Donahue, & Kentle, 1991). Characteristics addressed in these analyses include variables anticipated to predict social dominance in general (i.e., strategy-independent resource control), such as openness to experience (i.e., imaginative, curious, adventurous, reverse of conservative), and the surgency facet of extraversion (i.e., reverse coding of shy/withdrawn, passive/quiet, and reserved/ introverted), and personality variables expected to be differentially associated with prosocial and coercive strategies in older children, such as agreeableness (kind, understanding, generous; e.g., Graziano, Jensen-Campbell, & Hair, 1996), conscientiousness (thorough, prudent, hard-working, organised; e.g., Caspi, 1998), the ability to detect social cues (e.g., noticing when he/she makes someone feel bad/good; e.g., Edwards & Pledger, 1990), and hostility and aggression (e.g., hurts others, teases, quick to anger; McCrave & John, 1992).

Regression analyses. In order to predict social dominance with age, size, gender, and personality variables, simultaneous regressions were performed (i.e., significance is assessed after all other predictors are controlled for). These analyses allow for a more conservative exploration of the hypotheses because of the more stringent significance criteria.

Social competence. Parents assessed their child’s/children’s social competencies via the Child California Q-sort (Waters, Garber, Gornal, & Vaughn, 1983; German version by Göttett & Asendorp, 1989). The social desirability of the items was partialed (Waters, Noyes, Vaughn, & Rick, 1985; Bost et al., 1998). The social competence Q-sort in general reflects a child’s ability to establish and maintain positive social interactions, ability to cope with stress, and behavioural confidence and autonomy.

Peer regard. All children at the day care centre were asked about their friendships with other children at the centre in the context of a sociometric interview. Children were asked to list as many peers as they wanted who they considered: (a) fun, (b) likeable, (c) good to play with, (d) a friend, (e) a best friend, and (f) their very best friend. Children were also asked to name peers with whom they occasionally fight. Children who responded “everybody” were excluded from the analyses. Because all children performed this task, a child not only named peers but was also named by peers. Therefore, these items have active (a child names peers) and passive versions (a child is named by peers). Passive versions of items a–e (i.e., the degree to which a child is named) were collapsed to form a concept reflecting likeability (Likeability) and active versions of the six items (i.e., the number of peers a child names) were collapsed to form a concept reflecting social affinity (Social Affinity). Similarly, Active Fight and Passive Fight reflect the degree to which a child names others and is named by others in terms of quarrels. If a child named a peer more than once (e.g., they like a peer and the peer is a friend), that nomination was counted only once.

Children’s resource use and resource-control strategies

The children’s actual (vs. other-reported dominance status) resource control behaviour and the strategies they employ were assessed in pre-arranged play situations. The goal was to observe how high resource-controlling children (i.e., socially dominant children) control resources in the presence of familiar peers of lesser rank (cf. Hawley & Little, 1999). Accordingly, a play situation was devised that sought to promote resource control behaviours of socially dominant children while simultaneously stimulating social interaction with a peer.

Cooperative-competitive task. We presented each dyad with a novel play task. The task was presented in such a way as to lead the children to believe that the game was cooperative in nature and had a goal that could be best reached if the children coordinated their behaviour. Importantly, each task had a distinct competitive element that was of central theoretical focus. Specifically, each play activity was organised around two roles: One role was “primary” in that it involved high activity and high engagement with an attractive and novel toy. The other role was “secondary” in that it served a supportive function to the primary role, and accordingly granted interaction of lower quality with the toy (see Table 1 for activities). For example, the primary role of one activity (“Rappel Zappel”) called for the child to place coloured marbles with tongs on 20 outstretched hands of a colourful standing caterpillar that swayed in response to sound (e.g., voices or laughter). The child occupying the secondary role was to pass the marbles to the first child in a plastic spoon. The assignment of roles was left wholly to the children (i.e., they were not assigned by the researchers).

Although the children were verbally encouraged to cooperate, the game could be played without the participation of the partner; the child occupying the primary role could play alone. The secondary role was superfluous to “task completion” as the task was merely to “play the game”. The child occupying the primary role could actually easily bypass the secondary role. We reasoned that despite the “cooperative” nature of the task and the inducement to cooperate, children would compete for the roles at the beginning and during the play session. In this sense, the resource to compete for was the primary role because it yielded the highest access to the toy. The degree to which the children actually cooperated, and the manner in which this was achieved, was reflected in the outcome variables of interest.

Framed interactions. Interactions were filmed from a wooden loft above the children’s heads where the assistant at the camera was visible, but not conspicuous. Portable microphones were attached to the children’s clothing. On test days
<table>
<thead>
<tr>
<th>Game</th>
<th>Primary role</th>
<th>Secondary role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Rapped Zappal”</strong>: Moving caterpillar on which marbles are placed</td>
<td>Marble placer</td>
<td>Marble provider</td>
</tr>
<tr>
<td><strong>“Elephant”</strong>: Mechanical elephant blows butterflies out trunk into the air</td>
<td>Butterfly catcher</td>
<td>Retrieves uncaught butterflies</td>
</tr>
<tr>
<td>Rotating fish pond from which snapping fish are retrieved</td>
<td>Fish catcher</td>
<td>Collects fish and places in basket</td>
</tr>
<tr>
<td><strong>“Kreco-doc”</strong>: Teeth are pulled from the mouth of a mechanical crocodile</td>
<td>Teeth puller</td>
<td>Collects teeth and holds in a bowl</td>
</tr>
<tr>
<td>Remote-controlled hippo</td>
<td>Hippo driver</td>
<td>Corrects path of wayward hippo by hand</td>
</tr>
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</table>

Twice weekly, two children were taken to a playroom equipped with a child-sized table and chairs and the play material. The children were first seated in chairs outside of the immediate play area. While the children were seated away from the play material, the male tester carefully explained and demonstrated the roles and the task. The tester instructed the children to work together to complete the game. He then insisted they stay seated until he had fully left the room. Only then could the children decide who was to assume each role. After five minutes of filmed interactions, the play session was terminated by the tester.

**Behavioural coding.** To code the dyadic behavioural interactions, each five minute interaction segment was divided into 30 ten second intervals (Rhine & Linville, 1980). The behaviour of each child was coded into over nine-micro-level categories (e.g., suggest, help, take, etc.). The average inter-coder agreement at the level of the five minute measurement occasion based on a randomly selected sample of occasions (per cent agreement; McGrew, 1972) was above 95% (kappas before recording ranged from .38 to 1.0 per behaviour per observation occasion, with an average of 95%; Gottman & Roy, 1990). Significant disagreements on complex interactions (e.g., kappas < .60 per behaviour for an observation occasion) were addressed in team discussions and rescoped. Continuous variables were created by calculating the proportion of intervals in which a behaviour occurred over the five minute segment.

**Molar behavioural categories.** For this study, three molar-level behavioural categories were of interest, namely, resource control, prosocial control, and coercive control. Per observation occasion, a child’s score on each of the three behavioural categories was derived by aggregating over the defining micro-level behaviours. For example, a child was engaging in prosocial control when he/she: (a) made suggestions or prompted the partner (e.g., “you can pick up the marbles with the spoon”); (b) demonstrated to, guided, or “helped” the play partner (e.g., “if you hold it this way, the marbles won’t fall out”), or “I’ll show you how we’re supposed to put the marbles on his hands”); (c) offered objects (e.g., “you can take the spoon”); and (d) verbally misled the partner by, for example, suggesting that it was in their best interest not to have the contested resource (e.g., “you find the marbles when they fall because it’s more fun”). In contrast, a child engaged in coercive control when he/she: (a) took objects directly; (b) thwarted the play partner (e.g., “no, don’t touch the tweezers”, or “not yet, I’m not done”); (c) was physically aggressive (e.g., push, hand slap); and (d) insulted the partner (e.g., “you’re too dumb to use the tweezers”). Last, a child was coded as controlling the resource for each interval that a child performed the primary role regardless of how this was achieved.

**Results.** Before presenting the results as they pertain to the hypotheses, the validity of the social dominance construct is examined because it formed the foundation of the study design.

**Relationships between social dominance and resource control.** Dominance scores derived by the two methods (caregiver ranking and caretaker rating) were correlated .46 ($p = .01$), and the internal consistency of dominance status was .63. Additionally, caretaker-rated dominance status and actual resource control (i.e., occupation of the primary role) were significantly correlated ($r = .67, p = .0001$; see Table 2). That is, the higher the child was in dominance status, the more likely he/she occupied the primary role and controlled the attractive resource.Collapsed across all children, the primary role was occupied 45% of all intervals observed ($M = 0.45$, $SD = 0.29$). But the dominant children (i.e., the five most dominant children of a play group multiplied by three play groups) occupied the primary role significantly more on average than the subordinate children did ($M$ dominants $= 0.71$, $SD = 0.15$; $M$ subordinates $= 0.19$, $SD = 0.14$; $p = .0001$; $r^2 = .78$). Specifically, dominant children controlled the toy for 71% of the 10-second intervals on average (i.e., $M = 0.71$); whereas the subordinate children occupied the primary role for only 19% of the time on average (i.e., $M = 0.19$). In other words, the children whom the caretakers rated as having a history of being the resource controllers were in fact more likely to control the desired resource in the play situation. Therefore, caretaker-rated dominance status was a valid means to divide children into dominant and subordinate groups. Importantly, such a pattern also verified that the primary role was indeed a resource.
Table 2
Intercorrelations among behavioural strategies and actual resource control

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<tr>
<th></th>
<th>Primary role</th>
<th>Prosocial</th>
<th>Coercive</th>
<th>Dominance status</th>
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<tbody>
<tr>
<td>Primary role</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial</td>
<td>.53*</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coercive</td>
<td>.46**</td>
<td>.67**</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Dominance status</td>
<td>.67**</td>
<td>.55**</td>
<td>.47**</td>
<td>1.0</td>
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</tbody>
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Note: Based on n = 30. **p ≤ .01.

Questions of study

Question 1: What predicts dominance status? A label of dominance (e.g., caretaker ratings) appears to correspond with differences in behaviour (e.g., controlling resources). What predicts a child’s dominance status? Two of the three hypothesised predictors of social dominance (i.e., age, parent-rated openness to experience, and parent-rated extraversion) were significantly or marginally correlated with dominance status (Age: r = .57, p = .009; Extraversion: r = .36, p = .06). Parent-rated openness to experience was not associated with a child’s dominance status in the day care context (Openness: r = .18, p = .36). Independent of the effects of age, size was not a significant contributor, nor was gender. As mentioned, a simultaneous regression analysis was used to examine the unique contributions of each predictor (controlling for all others) to dominance status. Age alone uniquely accounted for 29% (p = .001), the surgery facet of extraversion uniquely accounted for 23% (p = .009), whereas size accounted for only 2% (p = .45). With 56% of the variance explained, 2% of the variance was common to all three.

Question 2: Are prosocial and coercive behaviours associated with effective resource control? One of the main and novel questions of the study concerns the relationships among prosocial behaviour, coercive behaviour, and resource control. As shown in Table 2, resource control was related to both prosocial control (r = .53, p = .003) and coercive control (r = .46, p = .01). In addition, and as expected, prosocial control and coercive control were correlated to each other (r = .67, p = .0001). Similarly, the dominant children engaged in significantly more prosocial behaviour on average than the subordinate children did (M dominants = 0.11, SD = 0.06; M subordinates = 0.03, SD = 0.02; p = .0001; r² = .45) and significantly more coercive behaviour (M dominants = 0.05, SD = 0.03; M subordinates = 0.02, SD = 0.02; p = .0008; r² = .34). Additionally, dominance status was correlated significantly with both prosocial and coercive behaviour (r prosocial = .55, p = .002; r coercive = .47, p = .009).

Note, however, that dominant children engaged in prosocial behaviour nearly twice as often on average as they employed coercive behaviours (i.e., 11% of intervals observed vs. 5% of intervals observed). Subordinate children, in contrast engaged in prosocial and coercive behaviours with equal frequency (i.e., 3% of the intervals vs. 2% of the intervals). Overall, summed over dominants and subordinates, prosocial and coercive control behaviour occurred on average in 21% of all intervals observed, or for approximately one minute out of every five.

Question 3: Are prosocial and coercive strategies associated with personality, social skills, and peer regard? Of the five parent-rated personality and social ability factors associated with behavioural strategies in older children (i.e., agreeableness, conscientiousness, ability to detect social cues, hostility, and aggression), none (as expected) were significantly correlated with coercive or prosocial strategies in the play situation in these 3- to 6-year-olds (agreeableness with prosocial control; r = -.23, p = .24; with coercive control; r = -.03, p = .89; Conscientiousness with prosocial control; r = .14, p = .49; with coercive control; r = .24, p = .22; Social cues with prosocial control; r = -.06, p = .77; with coercive control; r = -.13, p = .51; Hostility with prosocial control; r = -.07, p = .72; with coercive control; r = -.28, p = .14; Aggressiveness with prosocial control; r = -.11, p = .36; with coercive control; r = -.19, p = .34).

Of the parent-rated social competence measure and the four peer-rated sociometric variables (i.e., Likeability, Passive Fight, Social Affinity, Active Fight), five significant or marginally significant relationships emerged (see Table 3). First, control strategies of both types were significantly correlated with parent-assessed social competence (prosocial control: r = .41, p = .02; coercive control: r = .42, p = .02). Second, coercive control was correlated to some degree (although not significantly so) with Likeability (r = .31, p = .09). Third, coercive control was positively correlated with the tendency to report fighting with peers (Active Fight; r = .43, p = .02). There were no significant relationships between the control strategies and Social Affinity or Passive Fight.

Despite their significant overlap, age and dominance status appear to be different in important ways, in that they displayed differential relationships to variables related to peer regard. For example, although status was unrelated to Likeability (r = .08, p = .67) and Social Affinity r = .13, p = .51), age was significantly related to both (r = .30, p = .005 and r = .42, p = .03, respectively). Also, although prosocial control and coercive control were both related to social competence, age had no such relationship with social competence (r = .17, p = .36).

Table 3
Outcome correlates to prosocial and coercive control strategies observed in play

<table>
<thead>
<tr>
<th></th>
<th>Prosocial control</th>
<th>Coercive control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Competence</td>
<td>.41 (p = .02)</td>
<td>.42 (p = .02)</td>
</tr>
<tr>
<td>Likeability</td>
<td>.23 (p = .22)</td>
<td>.31 (p = .09)</td>
</tr>
<tr>
<td>Passive Fight</td>
<td>.12 (p = .53)</td>
<td>.16 (p = .41)</td>
</tr>
<tr>
<td>Social Affinity</td>
<td>.28 (p = .15)</td>
<td>.13 (p = .51)</td>
</tr>
<tr>
<td>Active Fight</td>
<td>.27 (p = .17)</td>
<td>.43 (p = .02)</td>
</tr>
</tbody>
</table>

*a Parent-rated. b Derived from peer ratings.
Gender differences in resource control and dominance status. As expected, the means of both control strategies (i.e., prosocial and coercive) and resource control (i.e., primary role) did not differ by gender. Specifically, the girls did not differ from the boys for resource use (girls, M = 0.47, SD = 0.28; boys, M = 0.43, SD = 0.32; p = .70), dominance status (girls, M = 10.7; SD = 2.9; boys, M = 9.73, SD = 3.9; p = .46), prosocial control (girls, M = 0.08, SD = 0.06; boys, M = 0.05, SD = 0.05; p = .20), or coercive control (girls, M = 0.04, SD = 0.04; boys, M = 0.03, SD = 0.02; p = .30).

Discussion

This study is one of a series that is beginning to address resource control from early childhood to adolescence, and its association with personality, social competence, and relationships in the peer group. For this study, the proposed predictions and expectations were based explicitly on the age of the participants (i.e., three to six years). How a child pursues resources, predictors of his/her success in doing so (i.e., social dominance), and how his/her strategy employed is related to his or her social orientation and peer relationships are expected to change as he/she gets older (Hawley, 1999a). In general, the results supported the predictions related to the three questions posed. Below, I review the findings and then discuss more broadly their implications for a strategy-based approach to resource control.

Is dominance status meaningful?

Before proceeding with the discussion and the questions at hand, the validity of an important assumption should be addressed. Namely, was caregiver assessment of dominance status a valid means to divide the children into dominant and subordinate groups? As was shown in Table 2, dominance status was positively correlated with holding the primary play role. In other words, the children that the caregivers rated as being socially dominant were in fact more likely to control the desired resource in the play situation. This point supports the use of the dominance status concept to divide dominant and subordinate children and incorporate this division into the study design. Additionally, these relationships highlight the value of caregivers’ assessments of a highly visible dimension of social organization and behavior.

Predicting dominance status in preschool children

A child’s social dominance status—defined in terms of resource control—presumably reflects his/her relative competitive ability in the peer group. I hypothesized that this strategy-independent construct would be predicted by variables reflecting relative ability (e.g., age) as well as proclivity to do so (e.g., extraversion). As expected, older children were of higher social rank in the peer group. Although this relationship is compatible with work emphasizing the role of size and physical development to social dominance (e.g., Savin-Williams, 1979), it is also consistent with the theoretical approach adopted here which suggests that a child’s cognitive development is more important than his/her physical size. Coercive strategies may be well-served by physical size, but prosocial strategies need not be. Although this study did not explore cognitive factors independent of chronological age, physical size did not add any predictability to social dominance over the effects of chronological age. In addition, the primacy of cognitive development over physical size has been found in groups of toddlers (Hawley & Little, 1999). However, this question certainly warrants more detailed attention.

Parent-rated extraversion was nearly as important a contributor to dominance status as age. Openness to experience, however, did not predict a child’s dominance status, suggesting that it is this outwardurgency that is related to environmental control over aspects of intellectance such as curiosity and imagination (cf. Hogan & Hogan, 1991).

These findings support the utility of conceptualizing dominance status as a dependent variable in and of itself (e.g., Bernstein, 1981) and highlight the utility of exploring its predictors at various stages of development. It may be tempting to conclude that caretakers merely order children by age. Certainly age is a relevant factor in three- to six-year-old children, as it is in toddlers. Prevailing over peers, however, appears to require more than the ability afforded by age, such as the proclivity to do so. The oldest child in the group may not be a resource-controller in the presence of peers because he/she is, for example, withdrawn and inhibited. Conversely, an active, extravedt toddler is at a disadvantage among more experienced and developed preschoolers. Social dominance is not a single-indicator construct and raters appear to implicitly recognize this fact. Furthermore, despite the evident overlap between dominance status and age, these two constructs have differential relationships with variables related to peer relationships (i.e., Likeability and Social Affinity) suggesting that they reflect distinct constructs.

Prosocial behaviour as a resource control strategy

A distinctive hypothesis unique to this theoretical approach was that prosocial behaviour in this cooperative/competitive context would be positively related to resource control (i.e., would serve as an effective control strategy). As shown in Table 2, all the control concepts (prosocial, coercive, and primary role) were significantly intercorrelated. In fact, prosocial control had the highest correlations with the other control variables. This pattern supports the hypothesis that prosocial behaviour can serve as an effective resource control strategy (see also Charlesworth & LaFreniere, 1983; LaFreniere & Charlesworth, 1987).

This perhaps counter-intuitive finding may be clarified by the following example. At the onset of an observed play session, a child announced to her play partner that she should take turns catching fish and that she would begin. With some effort she caught a fish and then delivered the fishing rod to the other child at his urging. After a few seconds, she began to physically guide his hand (i.e., unsolicited help) until she commanded the fishing rod altogether. She eventually caught a fish and announced, “we caught your fish, now it’s my turn”. After she caught a fish she offered in a friendly manner to catch “his” fish for him, and so on. In this way, she occupied the primary role 80% of the time.

Personality and prosocial and coercive control. As hypothesized, prosocial control and coercive control behaviours were correlated at the level of the individual. That is, children who were engaging in prosocial behaviours such as suggesting, offering, and helping were also the children who were engaging in coercive behaviours, such as taking, thwarting, and
insulting. This correlation and the pattern of behaviour that it represents support the notion that the strategies may not be well-differentiated at this point in development when prosocial strategies are emerging. For this reason, the strategies were not expected to have differential correlations with other measures such as agreeableness or hostility. Indeed, from a psychometric standpoint, the prosocial strategy and the coercive strategy are not separate entities in this age group (i.e., they lack discriminant validity; Campbell & Fiske, 1959).

Consistent with this logic, none of the five parent-rated personality and social ability factors (i.e., agreeableness, conscientiousness, ability to detect social cues, hostility, and aggression) were significantly correlated with observed strategy employment in the play situation. That is, prosocial control was no more related to agreeableness, conscientiousness, and the ability to detect social cues than was coercive control, and coercive control was no more related to hostility and aggressiveness than was prosocial control. Although this pattern diverges from the well-differentiated pattern found in schoolchildren (Hopmeyer & Asher, 1997; Newcomb et al., 1993), it is expected to overlap at this age, prior to differentiation in later age groups (Hawley, 1999a).

This array of nonrelationships, however, is not irrefutable evidence for a lack of differentiation between the control strategies. Several reasonable alternatives are possible. For example, personality measures are traditionally poor predictors of specific behaviour patterns in specific contexts (e.g., Epstein & O’Brien, 1985). Second, an agreeable child at home may not be an agreeable child in the day care or school context. That is, behaviour likely has a context-specific component and this is especially true of behaviour relating to social dominance (e.g., see Hawley & Little, 1999). Third, when a parent rates his/her child as agreeable, he/she is presumably comparing the child to other children. This implicit norm is likely not based on the day care context, but rather is likely based on contexts observed by the parent such as siblings or the neighbourhood circle. In contrast, dominance status was derived explicitly from comparisons with other children in the day care context. Personality may have been correlated with strategy use had it been based on relative standing within the day care context. As with any case where null results are expected for theoretical reasons and null results are obtained, the finding should be firmly replicated.

Social competence and the controlling child. Similar to the personality ratings, parent-rated social competence did not differentiate prosocial and coercive control. Again, given the degree of correlation between the strategy types and the context specificity of the behaviour patterns of question, this result is not surprising. What is interesting, however, as was shown in Table 3, is that both strategies are associated with parent-rated social competence. That is, children who engage in prosocial behaviour, coercive behaviour, or both are rated by their parents as socially competent. Yet, social competence was not related to age.

In general, as children grow older, prosocially controlling children and coercively controlling children are expected to have well-differentiated patterns of competencies and orientations with regard to the peer group. The measure of social competence used in this study, however (i.e., the California Child Q-sort; Waters et al., 1985), defines an optimally competent child not only as having characteristics presumably associated with prosocial control strategies (e.g., helpful, giving, considerate, empathic), but also having characteristics associated with social dominance in general (e.g., self-reliant, assertive, autonomous, competitive). In fact, 6 of the first 10 items of the abbreviated German version of the Q-sort (Göttert & Asendorpf, 1999) are defining features of generalised social dominance as defined here (see also Barrett & Yarrow, 1977; Vollenweider et al., 2000). Socially dominant children of all types would be expected to be assertive and independent. Distinctive features by strategy in older children might include, however, empathy and hostility.

Sociometrics and strategies of control. There are three primary reasons why strong relationships between sociometric variables and control strategies were not expected to arise. The first concerns the hypothesised and obtained degree of overlap between the two strategies (see above). The second concerns the undeveloped ability of preschoolers to make and act on complex character assessments (Damon, 1980; Smith & Guerney, 1977). In fact, the two peer-derived sociometric measures (Likeability and Passive Fight) were not related to the employment of control strategies in the play situation. That is, neither prosocial strategies nor coercive strategies were related to nominations of likeability or quarrelsomeness. The third reason could be that preschoolers’ reports within the context of our sociometric measure could be unreliable.

We did not find dominant children naming more children as likeable or as friends (Social Affinity). One might expect as we did that young dominant children would seek out, approach, and engage others more than other children (Strayer & Strayer, 1976; Vollenweider et al., 2000). Interestingly, the employment of coercive strategies was correlated with the tendency to name other children as those with whom they occasionally quarrel. This pattern indicates a degree of social insight that was unexpected. That is, children who tended to thwart their partner, take things, and insult their partner in the play situation were more likely to name names when it came to answering “who do you fight with sometimes”? It may be the case that it is these children who experience the lion’s share of confrontation in the peer group, especially because they themselves probably initiate it.

The patterns of behaviour observed within the context of this study may not characterise the behaviour of all dyads. Dominant children were deliberately paired with subordinate children to see “how dominant children dominate”. More conflict might have been observed if, for example, the children were of closer rank to each other, especially if both children were socially dominant. Also, friendship has been found to modulate dominance behaviour (LaPreiere & Charlessworth, 1987).

Summary. As expected, children who were older than their peers and extraverted had a relative advantage at controlling resources. Not only were coercive behaviours associated with this resource control, but so too were prosocial behaviours. That is, children who suggested, helped, and offered were more likely to maintain their control position than children who did not engage in these behaviours, even though common sense might suggest that helpful children would occupy the more supportive role. In the context of this study, where the children were observed in a “cooperative” play situation characterised by limited resources (i.e., intended to evoke competitive behaviour), these prosocial behaviours appeared to expedite resource control. However, also as expected, employ-
ing these strategies was not differently related to personality, social competence, or peer regard because of the immaturity of the participants and the hypothesised concurrent lack of differentiation between the control concepts. This conclusion certainly warrants further exploration, especially in the light of the study’s drawbacks, such as the small sample size, and that it was not longitudinal.

Why an evolutionary meta-theoretical perspective?
The purpose of this study, as with other studies operating within an evolutionary framework, was not to test (or falsify) evolutionary theory. Instead, the theory of evolution by natural selection gives rise to sub-theories regarding, for example, parent-offspring relationships, mating patterns, or, as in the present case, strategies of competition (Buss, 1996). The outcomes of the present study suggest that prosocial behaviour under certain conditions is related to resource control and that prosocial and coercive behaviour in this age group are highly related. Developmentalists operating under various theoretical traditions may find these findings interesting, although it is unlikely that these predictions would arise from non-evolutionary orientations. Prosocial behaviour is generally not thought of as functionally similar to coercive behaviour (cf. Hawley, 1999a). By linking coercive and prosocial strategies explicitly to the general motive for resource control, for example, we can entertain new predictions about ways in which prosocial and coercive children are the same, even though the bulk of previous research has focused on differences between them (e.g., rejected vs. popular children; Newcomb et al., 1993).

Conclusions and a word of caution
The theoretical model underlying the hypotheses (Hawley, 1999a) is essentially causal and directional and its thorough testing compels longitudinal design. The data of the current study allow only exploration of simultaneous relationships. As with most studies that are correlational in nature, causal inferences cannot be assured and the results of the current study do not provide incontrovertible evidence for any underlying pattern of causation. In addition, the sample size at the level of the individual was modest. Although 72 dyadic interactions were observed, they were based on 30 children, only 15 of whom were classified as dominant. Furthermore, one could legitimately wonder whether the conclusions based on this German sample (e.g., ethnically homogeneous) would generalise to an American sample. Last, optimally, personality ratings should be obtained from both parents and teachers in order to rule out the possibility that the pattern of results concerning the personality contracts was due to the raters. Despite these limitations, the present study is not without merit. The underlying model does offer clear predictions concerning patterns of concurrent relationships. Considered in the light of other studies addressing similar issues at different stages in the lifespan (i.e., Hawley & Little, 1999; Hawley et al., 2000), a coherent pattern that is line with theoretical expectations is emerging. Despite its shortcomings, this study provides preliminary support for the basic theoretical expectations.

When formulated in terms of resource control, social dominance in three- to six-year-old children appears to be related to a child's ability to prevail over peers (i.e., relative age) and proclivity to do so (i.e., extraversion). Social dominance, however, was not the same as coercion and aggression. On the contrary, prosocial behaviour may also be an effective and moreover socially desirable means of control. Social dominance relations are a salient and potentially profound aspect of social organisation across the lifespan. Although necessarily simplified here, the causes and effects of competitive advantage are undoubtedly enormously complex. Perhaps most thought-provoking for developmentalists, however, is the suggestion that prosociality and anti-sociality may not be polar opposites, but rather two sides of the same coin.

References