Advances in Social Sciences Research Journal – Vol. 12, No. 09
Publication Date: September 06, 2025
DOI:10.14738/assrj.1209.19332.
Volk, A. A., Dane, A. V., Craig, W., Spadafora, N., Andrews, N. C. Z., Vitoroulis, I., Farrell, A. H., & Lambe, L. J. (2025). Cooperative versus Coercive Social Power in Adolescence. *Advances in Social Sciences Research Journal*, 12(09). 08-30.

Cooperative versus Coercive Social Power in Adolescence

Anthony A. Volk
Department of Child and Youth Studies, Brock University
and Department of Psychology, Brock University

Andrew V. Dane
Department of Psychology, Brock University

Wendy Craig
Department of Psychology, Queen's Psychology

Natalie Spadafora
Department of Child and Youth Studies, Brock University

Naomi C. Z. Andrews
Department of Child and Youth Studies, Brock University

Irene Vitoroulis
School of Psychology, University of Ottawa

Ann H. Farrell
Department of Child and Youth Studies, Brock University

Laura J. Lambe
Department of Psychology, St. Francis Xavier University

ABSTRACT

There are two fundamental forms of social power: cooperative (where individuals mutually benefit) and coercive (where the more powerful gains at the expense of the other). Each is composed of two separate aspects: power holding (e.g., being popular) and power-enhancing(e.g., using force). Research has generally studied these two forms of social power in a single measure and without consideration of their combined effect nor examined their combined influence or associations with peer reactions. We therefore used a measure that captured both aspects and forms of adolescent social power as well as to determine their associations with positive and aggressive peer responses. Based on a sample of 559 adolescents, our confirmatory factor analysis demonstrated that adolescents viewed each form of social power as being distinct from each other and composed of both power-holding and power-enhancing aspects. We then ran structural equation models that showed cooperative social power was associated with numerous positive peer responses (e.g., friendship, respect) while coercive social power was associated with fewer positive peer responses (e.g., attractiveness, support in a conflict) as well as more aggressive peer responses (e.g., bullying and victimization). Our longitudinal data (collected 6 months later) showed even clearer separation of these associations of

these two forms of social power. Overall, our results suggest that researchers should use measures that capture both aspects of social power and that each form of social power has a distinct pattern of associations with peer responses.

Keywords: social power, cooperative social power, coercive social power, adolescence.

COOPERATIVE VERSUS COERCIVE SOCIAL POWER IN ADOLESCENCE

In the social sciences, social power has long been recognized as a central concept in many facets of human interactions[1], including such diverse domains as aggression and bullying[2], dating[3], and politics[4]. Social power is typically defined as the ability to influence or change the beliefs, attitudes, or behavior of others[5]. Not everyone seeks to obtain or maintain social power, but for those who do, there is a rich history[6]. across a variety of disciplines have shown that there are two fundamental pathways for doing so. One form of social power derives from building cooperative relationships and displaying valued characteristics that garner attention, respect, and social influence – this has been variously called prestige[7], social attention holding power[8], soft power[9], and enduring power[10]. Another type of social power, called dominance[11], harsh power[9], absolute power[10], and resource holding power[12], achieves deference that benefits the wielder through force or intimidation.

Despite the use of many different terms, there are effectively two distinct forms of social power – producing either non-zero-sum mutual benefits or zero-sum gains that unfairly benefit those with power. This fundamental division mirrors the reality that all relationships can be categorized either as synergistic and mutually beneficial or exploitative in which one party benefits at the expense of the other[10, 13]. Therefore, we have labelled these two forms cooperative and coercive social power, to emphasize non-zero-sum synergies and mutual benefits versus unequal zero-sum gains, respectively. We know from the social psychology power literature[1] that adults broadly view power as having these two general forms, but what about adolescents? Do adolescents view social power as coming from two distinct categories, with mutualistic versus zero-sum costs and benefits? Given that cooperative social power emphasizes the synergy of non-zero-sum gains and mutual benefits, does it relate more strongly to positive peer regard among adolescents (e.g., respect, attractiveness, interest in friendships)? In contrast, does the emphasis on achieving individual gain through coercion in coercive social power result in a higher level of conflict with adolescents' peers (e.g., bullying, victimization)? Finally, given that adolescent peer relationships are not static, but rather a reflection of a dynamic developmental stage of life[14], do the relationships among the two forms of social power and peer reactions change over time? Our goal was to answer these questions using a measure aimed at capturing and integrating both cooperative and coercive forms of social power: power-enhancing processes and power-holding characteristics. Equipped with that new measure, we examined peers' reactions to each form of social power (cooperative versus coercive) with respect to positive peer regard (e.g., friendship, respect) as well as peer conflict (e.g., aggression and victimization), by examining both concurrent and six-month longitudinal data to test for the stability of these relationships over adolescence.

Cooperative and Coercive Power

Social power can be fundamentally viewed in terms of either non-zero-sum or zero-sum gains. This distinction has a longstanding history, as evolutionary theory identifies that most forms of animal social behavior can been characterized as either selfish behavior or mutually beneficial

behavior[15, 16]. Cooperative and coercive forms of social power are in turn each composed of two different aspects of social power: *power-enhancing processes* that are strategies or mechanisms that have been associated with gains in power (that may or may not imply motives or the intention to seek power) and *power-holding characteristics* that reflect the possession of social power (e.g., popularity, likeability or dominance) that can be wielded to influence the behavior of others (see Figure 1). Power-enhancing processes refer to behavior or characteristics that tend to increase or maintain social power (e.g., coercing others or negotiating a mutual agreement), but in contrast to power-holding characteristics, they do not speak to actually having a particular kind of power. We argue that a comprehensive measure of total social power requires both power-enhancing and power-holding aspects (Figure 1), yet the two are often measured separately[17] without consideration of their combined influence. For example, conceptualizations and predictions regarding dominance or prestige often assume that they are attained through coercive and cooperative means, respectively[7], but measures of these power-holding characteristics seldom refer to the power-enhancing processes that may have been used to obtain this power[18]. These measures therefore overlook the possibility that power-enhancing and power-holding aspects can reinforce each other. For example, the inclination towards one form of power reinforces the ability to hold that power and vice-versa[17, 19]. This is an important distinction that has often been overlooked by power researchers[20].

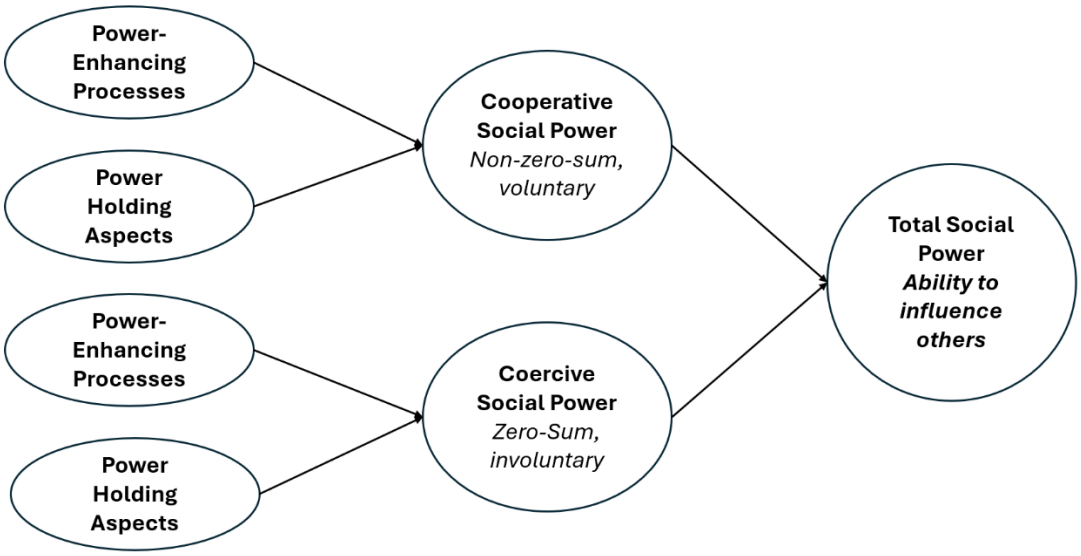

Figure 1: Aspects of Social Power

Cooperative social power is based on the ability to persuade others to engage in mutually beneficial, non-zero-sum interactions. This can be achieved and manifested through two separate aspects of social power. The first aspect involves the power-enhancing processes of mutually beneficial cooperation and prosocial behavior, such as kindness, helpfulness, generosity, reciprocity, humility, and persuasion[8, 10]. Theoretically[16] and empirically[21], cooperative relationships provide mutually beneficial social and coalitional support that synergistically increases access to resources. Classic evolutionary research based on the Prisoner's Dilemma[22] shows that, under conditions of repeated interactions, a cooperative approach of reciprocal altruism maximizes the long-term benefits for both parties[13].

The second aspect of cooperative social power is possessing *and communally* deploying peer-valued characteristics and/or high levels of competency that inspire respect and benefit others[20]. Peers seek to affiliate with these individuals and freely grant them social attention and deference, which in turn provides a platform that could persuade and influence others towards mutualistic behavior[10]. Critically, we differ from other evolutionary theories[11, 23] in that we argue that peer-valued characteristics are not valued for their own sake. Rather, it is their ability to be employed for mutualistic, non-zero-sum gains that generates prestige. This means that cooperative power is based not only on possessing peer-valued characteristics, but in one's capacity to generate mutually beneficial, non-zero sum prosocial behavior, that is in turn enhanced by peer-valued characteristics. Peer-valued traits thus serve as a moderator of cooperative social power but may not be a uniquely fundamental aspect of it as suggested by some theories of prestige [11, 23]. As a result, the benefits of cooperative social power may last longer than those gained through coercion as they promote prolonged mutual benefit[10, 13].

In contrast, coercive power-enhancing processes involve the use of threats and intimidation, with a focus on self-interest and individual gains rather than the mutual well-being[7, 8]. This need not involve direct force, it can also include a limitation of response choices or a restriction of the behavioral options available to the target[24]. The power-holding characteristics of coercive social power has been described as dominance[20], distinguished by the ability to control social and material resources. In contrast to being liked (an aspect of cooperative power), being popular is another indicator of holding coercive power, as it involves obtaining an elevated spot in a zero-sum ranking among peers[25]. The mechanism of coercive social influence works through direct or indirect coercion, with deference often being given to avoid harm rather than receiving benefits [11]. This differs from cooperation wherein the other party retains a degree of control and influence over the interaction and the outcomes[20]. Perhaps not surprisingly then, benefits of coercive social power tend to be more short-term[10, 20].

Coercive social power also may attract relationship partners through different mechanisms than cooperative social power. In this vein, bullies (i.e., coercive aggressors) tend to be assisted and reinforced by bystanders[26]. Despite engagement in exploitative rather than cooperative behavior, coercive social power may afford positive externalities [27], in which a powerful peer provides incidental benefits, such as protection and access to popular social networks, to those with whom they affiliate[20]. For example, aggression has been associated with attracting and maintaining sexual partners[28], presumably due to related displays of formidability and resource holding potential.

Cooperative and Coercive Power in Adolescence

Adolescence is likely to be a salient period for the expression of social power for two reasons. First, adolescence is a significant period of developmental change from childhood to adulthood where many important traits and forms of behavior emerge, are modified, and/or become increasingly entrenched with the onset of adulthood [29, 30]. Second, during adolescence social relationships take on an enhanced importance, especially with regards to peer relationships[14]. These relationships, and their outcomes, can be highly influenced by social power, leading adolescents to be keenly aware of the use (and abuse) of social power [2, 31]. Importantly, adolescents can be strongly motivated towards adopting one form of power over the other, suggesting that they are indeed separate processes in need of study [32].

The aspects of social power may vary by developmental period, particularly during adolescence [33]. For example, younger adolescents have a difficult time differentiating between power-holding characteristics of coercive power such as popularity from power-holding aspects of cooperative power such as likeability [34]. In contrast, older adolescents view popularity and being liked as related, but separate aspects of social power [34]. Although conceptualizations of coercive and cooperative social power tend to integrate power-enhancing processes and power-holding characteristics, research on adolescent social power tends to measure and analyze the two aspects separately. There is relatively little evidence about whether adolescents view social power as having cooperative and coercive forms of power-enhancing strategies and power-holding characteristics. Most developmental researchers have avoided directly studying the strategies associated with social power and instead have studied factors associated with holding social power, including popularity, and likeability [34] (see [48] for an exception).

In contrast, resource control theory (RCT), has examined the use of coercive and prosocial strategies to achieve social dominance, a broad construct that does not differentiate dominance from implicit or softer forms of power such as likeability or prestige nor does it emphasize non-competitive functions of prosocial strategies such as generating mutual benefits [33, 35]. This research has shown that a combination of coercive and prosocial strategies was most strongly associated with perceived popularity, dominance, and resource control, but also with being less socially preferred (i.e., more rejected than liked) by peers and having more enemies and conflictual friendships[36, 37, 38]. RCT has been supported by some of the ensuing research on adolescent social power strategies [39], but remains unconfirmed in other studies, that failed to replicate [40]. Adolescent research thus remains unclear as to how the two combined aspects of social power relate to peer reactions.

Peer Reactions to Forms of Adolescent Social Power

Cooperative and coercive power involve different power-enhancing processes, different power-holding attributes, and thus different theoretical mechanisms. For these reasons, they should also evoke different reactions from peers. While some of these reactions have been studied in adults [41], much less is known about their association with peer relations in adolescence. Given the prominence of peer influence in adolescence[14], the response of peers to each form of social power is likely to play a central role in defining each form's costs and benefits that are in turn critical for determining when and how they are expressed.

Positive Peer Regard and Adolescent Social Power

We begin by looking at peers' reaction to elements of the two forms of social power by exploring reactions related to positive peer regard including perceived attractiveness, positive reputations, friendships, and social network placement. The argument between whether "nice guys/girls" are more attractive than "bad boys/girls" has received a lot of attention in scientific and popular literatures [36, 42]. Evidence suggests that this may be because both forms of social power are associated with attractiveness as potential dating partners, desire the beneficent traits associated with cooperative social power, as well as the dominant traits associated with coercive social power [43, 44, 45, 46, 47]. Similarly, peers might respect (perhaps fearfully) coercive social power due to the formidability of its wielder [35, 48], while on the other hand, they might respect the mutualistic approach of cooperative social power[7]. Data on civility is clearer, as it

is positively related to aspects of cooperative social power and negatively related to aspects of coercive social power[49].

The data for friendships also are more one-sided. In friendships, the focus is often on reciprocity and mutual benefit, which are essential qualities of friendships[50]. Cooperative social power (i.e., its likeability aspect) is positively associated with friendships and influence over friends [51, 52, 53], unlike coercive social power (i.e., its popularity aspect). In contrast, more basic social alliances (e.g., siding with someone) can be less intimate and more transactional than friendships[54] and these alliances appear to be influenced by both the prospect of reciprocal assistance and the incidental benefits of positive externalities (e.g., protection and access to popular groups) that can result from affiliating with coercively powerful peers. Thus, both forms of social power can be associated with alliance formation.

In contrast to aspects of social power such as likeability or popularity, which are reputation-based, social network measures of individuals' social status reflect actual relationships and represent an individual's position within the structure of the peer group. Adolescents high in social network prestige (who used cooperative strategies) were those who had closer friendship connections to youth who themselves have many close connections (i.e., they were closely connected to many others within the overall peer group; [55]. In contrast, adolescents high in social network centrality who were more aggressive and powerful (i.e., coercive social power) showed a greater number of social connections and those connections were to highly connected peers[55]. Thus, each form of social power appears to relate to a different pattern of social relationships within adolescent social networks suggesting that each form of social power has a different pattern of positive social regard.

Peer Conflict and Adolescent Social Power

Given that social power is defined as the ability to change others, there is little surprise that it can relate to peer conflict, especially in its coercive form. Conflicts are present in many adolescent social relationships[14], making the links between both forms of social power and different dimensions of conflict a key attribute for both forms of social power. As noted above, cooperative power is based on forming mutually beneficial relationships. One would thus expect that it would be negatively related to bullying, which is fundamentally about selfishly exploiting individuals with less power [56]. One might well expect victimization would be negatively associated with cooperative social power both because it is not provocative (e.g., less associated with disliking and enmity; [37, 38] and because potential aggressors might fear losing peer esteem by attacking someone who is highly regarded [57].

In contrast, coercive social power appears to be strongly related to the perpetration of aggressive behavior[38], particularly aggression that involves a power imbalance in favor of the perpetrator (i.e., bullying) [58]. Intimidation from coercive social power can deter victimization [59], as it is associated with a willingness to engage in coercive and aggressive behavior[38]. On the flipside, the use of coercive competition could encourage victimization as individuals target other high-status competitors[60]. Using coercive, non-zero-sum tactics to rise in the social hierarchy likely creates victims and/or enemies who would return that hostility by victimizing the original perpetrator, even if they held high status[61]. Similarly, mixed results might be expected with respect to two other important roles in conflict - defending, and being defended by, others. Evidence suggests that defending is associated with overt popularity[62], a power-

holding characteristic of coercive social power, which might provide the power to defend successfully, and signal one's ability to coercively interfere with coercive peer relations by preventing others from using aggression to benefit themselves[63, 64]. Aggressive forms of defending are also associated with coercive power-enhancing processes such as bullying[64]. On the other hand, defending is theoretically and empirically related to prosocial behavior, a power-enhancing strategy of cooperative social power [64]. The reciprocal nature of cooperative social power should make it positively associated with being defended, but the same will not be true for coercive power whose selfish nature might deter defending that may not be reciprocated.

Current Study

To address the relationships between the two forms of adolescent social power and peer responses, our study examined whether adolescents' perceptions of their peers' power-enhancing strategies and power-holding characteristics were grouped into coherent, independent cooperative versus coercive forms of social power. We examined this idea with peer-reported data as they likely represent the most valid form of information about social (as opposed to individual) power[65]. We then used our measure to explore the links between the two forms of social power and two categories of peer responses: positive regard and conflict. Our predictions can be seen in Table 1. To examine whether these links persist over time, we used longitudinal data collected 6 months later. As these longitudinal data are more exploratory, we do not have strong *a priori* predictions for changes in relationships over time, other than that they will generally be smaller in size than the cross-sectional results. Beyond the positive regard and conflict relationships described above, we also controlled for age and gender. Some evidence suggests that older adolescents are more likely to pursue popularity versus likeability aspects of social power than younger adolescents[66]. With regards to gender, evidence suggests that boys and girls are relatively equal in terms of competitiveness[67], but that girls tend to be more altruistic[68] and boys tend to be more coercive[66].

Table 1: Predicted Relationships between Peer Factors and the Two Forms of Social Power

Peer Positive Regard Factors	Cooperative Social Power	Coercive Social Power
Attractive	+	+
Civil	+	-
Friends	+	
Respect	+	+
Side With	+	+
Social Network Centrality		+
Social Network Prestige	+	
Bullying Perpetration	-	+
Aggression Perpetration	-	+
Bullying Victimization	-	+
Aggression Victimization	-	+
Defended	+	+
Defender	+	+
Age	-	+
Gender (girls high)	+	-

Note. "+" indicates positive associations are predicted and "–" indicates negative associations are predicted.

METHODS

Participants

The sample for the current study was 559 adolescents (53.5% boys; 42.4% girls; 1.6% other; 2.5% prefer not to say) between the ages of 12 and 18 years old (M = 14.88 years; SD = 1.42). Self-reported race was 55.6% White, 9.5% Asian, 8.1% Black, 9.1% Latin, 4.1% Other, and 13.6% Mixed. Compared to the average Canadian, 49.2% said their family was "about the same" in wealth. Of these participants, 435 also had data at the second time point, resulting in a participation rate of 78% in the two timepoint analyses.

Procedure

Data for the current study were from an on-going, longitudinal study on adolescent relationships. As part of the larger study, Grade 8 students from five elementary schools, and Grades 9-12 students at one high school in southern Ontario (assigned to us by the local school board) were invited to participate. Parental consent and student assent were provided for Grade 8 students, while passive (opt-out) consent was used for high school students. For Time 1, the Grade 8 sample had a returned consent rate of 86.6% (with 90% of those being positive consent). For high school, the overall consent rate was 98%, with a participation rate of 87%. At Time 2, 89.3% of Grade 8 students returned their consent form (with 89% of those being positive consent). High school students had a 96% consent rate and 85% participation rate. The data for the current study was collected in Fall 2022 and 6 months later in Spring 2023; the same procedures were used for both waves. All methods and procedures were approved by both the University and school board Research Ethics Boards.

At each timepoint, participants completed both self-report and peer nomination surveys on electronic tablets, using Qualtrics, an online survey platform. The surveys took approximately one hour to complete, and trained research assistants were available to answer questions or assist students who had reading difficulties. For peer nominations, Grade 8 students were provided a list of students in their grade level who had parental consent to participate in the study and were able to select as many students as they wanted that fit each description. High school students were given spaces to type in the names (using autocomplete) of up to 7 students in their grade (except for those that had opted out from the study). In both cases, students could select "no one" if they felt that no one fit the description. Elementary schools were compensated $5 for every returned consent form (positive or negative), and high schools were compensated $5 for every student who was eligible to participate in the study. Students were entered into gift card draws for $100, with 1 gift card awarded for every 10 students. All peer nomination variables used in the current study were based on the received number of nominations for each question (e.g., the number of peers who nominated the individual for the item). All variables were standardized within grade prior to analyses.

Measures

Demographics:

Participants self-reported their age, gender, race, and their relative socioeconomic status.

Adolescent Social Power Scale:

To create our Adolescent Social Power Scale (ASPS), we drew upon inspiration from previous research [6, 34, 37, 69] that incorporated both aspects of social power across the two forms of social power. There were 4 items tapping *power seeking*: Who usually helps and cooperates with

others? (Cooperate); Who leads the group in a fair way? (Fair) Who is best at getting what they want? (Getting Want); Who forces, threatens or tricks others to get their way? (Force). Another 4 items tapped *power holding*: Who is kind to others? (Kind); Who do you like (is nice) in your grade? (Like); Who are the most popular people in your grade? (Popular); Who usually gets others to do what they say? (Do Say). When calculated as a scale (i.e., asummed), the internal consistency of each aspect was α = .90 for cooperative and α = .89 for coercive.

Positive Peer Regard:

In our study, positive peer regard includes being esteemed (e.g., as attractive, respected, and civil) and perceived as a desirable partner for friendships, alliances, and social networks. Participants were asked a number of questions to indicate how they viewed their peers at Time 1 and Time 2. These included: Who is civil (i.e., polite, courteous)? (Civil); Who are your best or closest friends? (Friends); Who is good looking? (Attractive); Who do others look up to and respect? (Respect); When there's a conflict in the group, who do people usually side with? (Side With).

Peer nominations (based on the question "Who are your best/closest friends?") were also used to calculate two indices of social network position: social network centrality and social network prestige. Within a social network, individuals are referred to as "nodes," and relations between nodes (here representing friendship nominations) are referred to as "ties." Because nominations were made at the grade level, the sample comprised 9 grade-level friendship networks (each with consent rates of over 80%), which were then used to calculate each individual's position within their network. Social network centrality (Centrality) was computed as Bonacich Centrality [70]. Bonacich centrality considers an individual's position within the overall network by weighting their centrality (based on the number of friendship ties they send to others) by the centrality of those they are connected to (i.e., the number of friends their friends have, and so on). It is a reflection of the extent to which an individual and the peers that they are connected to (based on their outgoing ties) are located centrally within a network[70]. Bonacich centrality is calculated as: $X(\alpha, \beta) = \alpha^*(I - \beta^*X) - 1X1$, where X represents the total friendship network, α represents a scaling factor, and β represents the degree to which an individual's centrality increases when weighted by their connections' centralities (here set to .1) [55, 70].

Social Network Prestige was computed as proximity prestige, a measure that represents the potential for influence over others within the overall social network [71, 72]. This measure takes into account both the number of peers connected to each node in the network (based on incoming ties) and the distance between the friendship ties, again accounting for connections across the entire network[72]. The equation for proximity prestige was: $PP(ni) = [Ii/(g-1)/[\sum d(ni,nj)/Ii]$, where Ii is the number of peers who can reach i, g is the number of individuals in the network X, and d (ni, nj) is the length of the shortest distance (i.e., the number of friendship ties) between individuals j and I [72].

Peer Conflict:

Participants were asked questions about perpetration, victimization, and defending of aggressive behavior. Bullying Perpetration: Two items assessed involvement in bullying perpetration. Specifically, participants were asked to nominate peers who are "**MORE** popular or stronger than you, who has **DONE THESE THINGS TO YOU?** Based on direct, including

physical (hitting, kicking, shoving, using physical force), and verbal (threatening or saying mean things), and indirect, consisting of relational (spreading negative rumours, leaving you out of a group activity), and cyber (using a cell phone or internet to send or post hurtful or embarrassing things to someone, or about someone) forms of aggression. Aggression Perpetration: Participants were then asked to nominate peers who perpetrated non-bullying aggressive behavior using the same two items discussed above, by selecting peers who are "**EQUALLY OR LESS** popular or strong than you, who has **DONE THESE THINGS TO YOU?"** Standardized received nominations of the two items were averaged for perpetration of both bullying and aggression.

Bullying Victimization: Similar to perpetration, two items (one focused on direct bullying, the other on indirect bullying actions) assessed bullying victimization. Participants were asked to nominate peers who were "**LESS** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?"** Aggression Victimization: Participants selected peers who had engaged in non-bullying aggressive behavior by selecting "Who is someone who is **EQUALLY OR MORE** popular or strong than you, who **YOU HAVE DONE THESE THINGS TO?"**

Defending (Defended): Adolescents responded to one item where they were asked to think about a time they were a victim to bullying, and select peers in their grade "who defended or stuck up for you when these things were done to you?" (e.g., physical: hitting, kicking, shoving or using physical force; verbal: threatening or saying mean things; relational: spreading negative rumours, leaving you out of a group activity), cyber (using a cell phone or internet to send or post hurtful or embarrassing things to someone, or about someone). Defender: Participants also selected peers who they had defended or stuck up for when they had witnessed any of the actions listed above done to someone else.

All measures completed by participants are available in Appendix A. Due to ethical restrictions against sharing the data of minors our data are not available. However, Mplus syntax for all primary analyses are available in Appendix B.

RESULTS

Statistical Analysis

We utilized Mplus version 7.2[73] to conduct structural equation modelling (SEM) using a two-step approach[74]. First, we conducted a confirmatory factor analysis to determine if the proposed measurement models for cooperative and coercive social power had acceptable fit. Specifically, this included four items loading on a cooperative factor (Cooperate, Fair, Kind, Like) and four items loading on a coercive factor (Popular, Getting Want, Do Say, Force). The latent factors were scaled by fixing one of each one's indicator paths to 1.0. Latent factors were allowed to correlate with one another. To assess model fit, we used the following fit indices guidelines: a comparative fit index (CFI) greater than .95, a root mean square error of approximation (RMSEA) less that .06, and a standardized root mean square residual (SRMR) less than .08 [75]. For a poor fitting model, modification indices were examined and residual variances were specified to correlate (should they make theoretical sense).

Next, we ran a series of structural equation models to test the direct paths from the latent factors to a variety of outcome variables. In all models, we estimated direct effects using robust maximum likelihood (MLR) to account for the non-normal distribution of some of the variables.

The first two models tested concurrent associations between cooperative and coercive approaches to social power, and social outcomes, with the first model examining positive peer regard (attractive, civil, friends, respect, side with, social network centrality, social network prestige), and the second model examining peer conflict (bullying and aggression perpetration, bullying and aggression victimization, defending and being defended by others to bullying). All direct paths were included and both models controlled for age and gender. For paths that were significant for both cooperative and coercive modes of social power, we constrained the paths using a Wald test to determine if the associations were significantly different from one another. Finally, we individually tested associations across time between the latent factors and each of the outcomes, controlling for baseline levels of the outcome (with age and gender). Table 2 displays all descriptive statistics and bivariate correlations.

Table 2: Descriptive Statistics and Bivariate Correlations between Cooperative and Coercive Modes of Power and Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. Cooperative	-	.32**	.69**	.58**	.39**	.56**	.52**	.30**	.07	.13*	.05	-.07	.13*	.37**	.46**		
2. Coercive	-	-	.13*	.28**	.47**	.44**	.67**	-.01	.17**	.64**	.34**	.01	.34**	.21**	.44**		
3. Civil	.84**	.10*	-	.56**	.31**	.50**	.38**	.27**	.05	.09*	.04	-.08*	.10**	.32**	.42**	.03	.17**
4. Friends	.66**	.28**	.39**	-	.41**	.59**	.54**	.30**	.19**	.25**	.22**	.06	.22**	.46**	.58**	.01	.02
5. Attractive	.50**	.56**	.28**	.33**	-	.49**	.47**	.12**	.09	.29**	.18**	.01	.21**	.31**	.44**	.02	.11*
6. Respect	.75**	.58**	.47**	.40**	.50**	-	.63**	.20**	.14**	.17**	.02	.08	.11**	.22**	.35**	.11*	.03
7. Side With	.53**	.72**	.30**	.44**	.55*	.60**	-	.12**	.19**	.49**	.25**	.07	.34**	.35**	.56**	.02	-.01
8. Centrality	.37**	.11*	.26**	.23**	.11**	.18**	.14**	-	-.08	-.04	-.01	-.06	.00	.13**	.13**	-.09	-.04
9. Prestige	.08	.07	.02	.29**	.03	.08	.11**	-.07	-	.13*	.01	-.03	.07	.05	.10	-.36**	-.10
10. Bullying Perp.	.05	.64**	.01	.17**	.36**	.29**	.48**	.08*	-.08	-	.47**	.19**	.57**	.27**	.33**	.03	-.01
11. Aggression Perp.	.03	.37**	-.03	.11**	.16**	.16**	.23**	-.03	-.11*	.43**	-	.44**	.48**	.30**	.24**	.01	.03
12. Bullying Vic.	-.01	.25**	-.01	.09*	.12**	.12**	.23**	-.01	-.01	.32**	.45**	-	.33**	.11**	.05	.01	-.08
13. Aggression Vic.	.08	.48**	.03	.17**	.33**	.20**	.36**	.10*	-.05	.58**	.45**	.37**	-	.23**	.23**	.03	-.01
14. Defended	.38**	.41**	.25**	.37**	.40**	.35**	.40**	.11**	.01	.31**	.26**	.28**	.30**	-	.51**	-.02	.05
15. Defender	.58**	.39**	.39**	.53**	.43**	.48**	.49**	.19**	.11*	.27**	.17**	.19**	.27**	.53**	-	.02	.07
16. Age			.06	.01	.04	.03	.03	.03	-.58**	.04	.07	.07	.05	.04	.02	-	-.01
17. Gender			.13**	.02	.02	.03	-.02	-.01	-.09	.02	-.03	-.03	.05	.01	.06	-.01	-
Mean T1	N/A	N/A	.05	.02	.03	.04	.04	.80	.27	.02	.02	.01	.02	.04	.05	15.25	1.44
Mean T2			.05	.09	.05	.07	.05	.76	.26	.03	.03	.02	.02	.06	.06	N/A	N/A
SD T1	N/A	N/A	1.01	.99	1.01	1.01	1.01	.63	.13	.91	.84	.84	.86	1.01	1.01	1.42	.50
SD T2			1.02	.10	1.03	1.02	1.02	.69	.14	.87	.70	.89	.74	1.02	1.02		

Note. **p<.01; *p<.05. Bivariate correlations below the diagonal are Time 1, while above are Time 2. Gender was coded as 1 = boy; 2 = girl. Age was reported at the first timepoint. Cooperative = Cooperative social power. Coercive = Coercive social power. Both were measured at Time 1. Perp = perpetration. Vic = Victimization. Centrality = Social network centrality. Prestige = Social network prestige.

Measurement Model

The initial confirmatory factor analysis indicated poor fit ($\chi^2(26) = 288.83$, $p < .001$; CFI = .89; RMSEA = .12; 90%CI [.11, .14]; SRMR = .09). Upon examining modification indices, we correlated residuals that made theoretical sense. In our final model, we added correlations between "Cooperate" and "Fair" and with "Like" and "Kind." We also added correlations between "Popular" and "Getting Want" and with "Do Say" and "Force". In the final model, all indicators were positive and significant and model fit was acceptable ($\chi^2(15) = 100.82$, $p < .001$; CFI = .96; RMSEA = .09; 90%CI [.08, .11]; SRMR = .06). The correlation between the two factors was .24 ($p < .001$). See Figure 2 for final latent factor model.

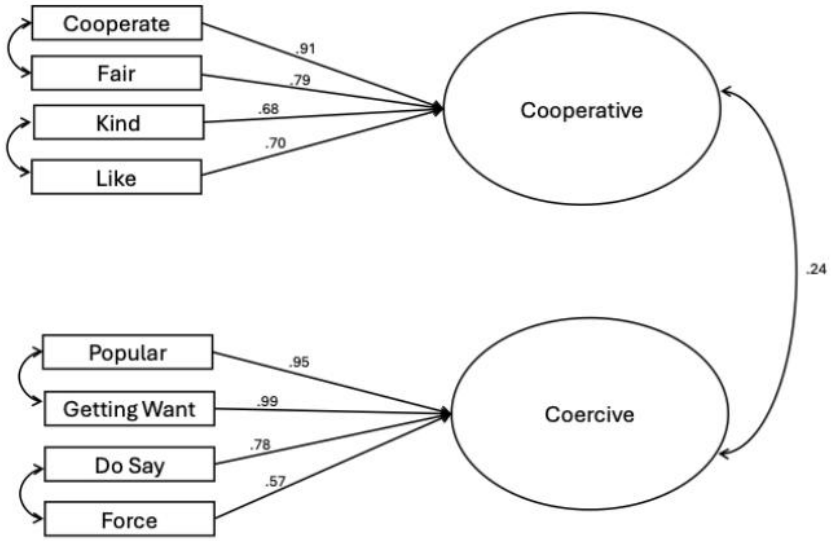

Figure 2: CFA Results of Cooperative and Coercive Modes of Social Power

Note. Standardized betas of significant paths are presented in diagram.

Structural Models

Positive Peer Regard and Adolescent Social Power:

Model fit was acceptable $\chi^2(73) = 262.20$, $p < .001$; CFI = .94; RMSEA = .07; 90%CI [.06, .08]; SRMR = .06. All significant effects are presented in Figure 3. There were significant positive effects such that cooperative social power was associated with being rated by peers as more attractive, civil, and respected, as a friend, as someone people side with, as well as higher social network centrality and social network prestige. Coercive social power was positively associated with peer ratings of being attractive, being respected, and being someone people sided with, and negatively associated with received nominations for being civil. Wald test analyses revealed that there was no difference in the relationship between cooperative and coercive modes of social power and attractiveness (Wald test, W(1) = .06, $p = .80$), but the association with respect was stronger for cooperative ($\beta = .62$) than coercive ($\beta = .35$; Wald test, W(1) = 11.31, $p < .001$), while the effect with who people side with was stronger for coercive ($\beta = .61$) than cooperative ($\beta = .31$; Wald test, W(1) = 5.57, $p < .05$).

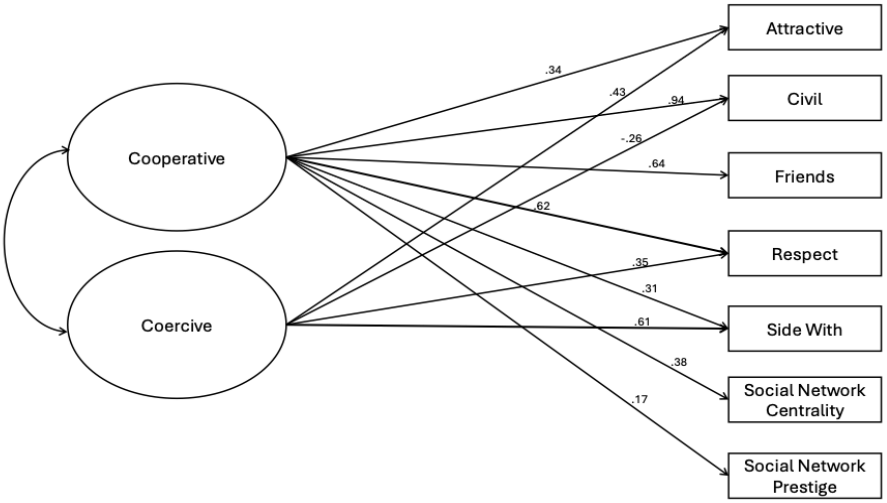

Figure 3: Positive Peer Regard and Adolescent Social Power Model Results (Concurrent)

Note. Standardized betas of significant paths are presented in diagram. Model controlled for age and gender but was removed from diagram for ease of presentation. Indicators for latent factors are not shown for ease of presentation.

Peer Conflict and Adolescent Social Power:

The fit for this model was also acceptable ($\chi^2(67) = 200.39$, $p < .001$; CFI = .95; RMSEA = .06; 90%CI [.05, .07]; SRMR = .05). Cooperative social power was negatively associated with perpetration of both bullying and aggression, while coercive was positively associated with both bullying perpetration and aggression. Victimization by both bullying and aggression was positively and significantly associated with coercive social power. There were significant positive associations between cooperative and coercive social power and both defending others and being defended *by* others against aggressive behavior. Wald tests revealed that cooperative social power (β = .51) was more strongly associated with being a defender of aggression than coercive social power (β = .22; Wald test, W(1) = 12.47, $p < .001$), while there was no significant difference for being defended (W(1) = .001, p = .97). See Figure 4 for all significant path results.

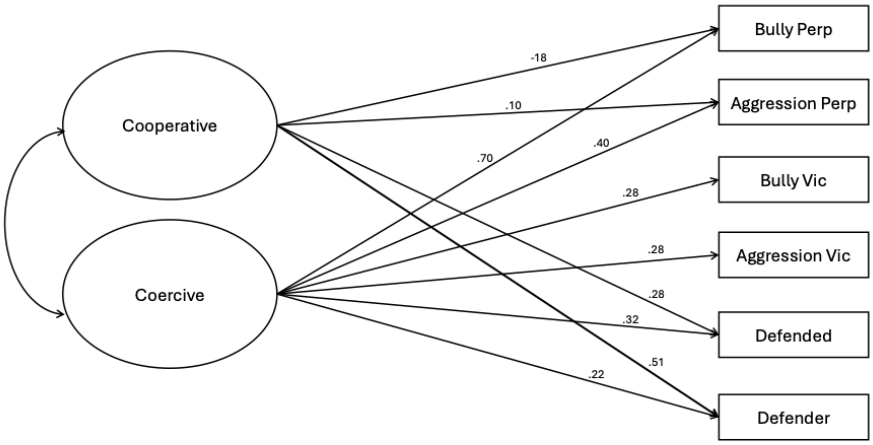

Figure 4: Peer Conflict and Adolescent Social Power Model Results (Concurrent)
***Note.* Standardized betas of significant paths are presented in diagram. Model controlled for age and gender but was removed from diagram for ease of presentation. Indicators for latent factors are not shown for ease of presentation. Perp = perpetration. Vic = Victimization.**

Longitudinal Models

There were significant across time positive effects with cooperative social power and being nominated as civil, someone's friend, respected, someone people side with, social network centrality, and someone who is both defended and a defender of bullying. Coercive social power was positively associated with being attractive, someone people side with, social network prestige, bullying and aggression perpetration, and being a defender (Table 3).

Table 3: Associations between Cooperative and Coercive Modes of Social Control Across Time

Time 2 Outcomes	Time 1 Cooperative				Time 1 Coercive			
	β	B	S.E.	95% CI	β	B	S.E.	95% CI
Attractive	0.07	0.1	0.07	[-.03, .17]	**0.11**	**0.1**	**0.04**	**[.04, 19]**
Civil	**0.36**	**0.48**	**0.12**	**[.19, .52]**	-0.01	-0.01	0.03	[-.07, .05]

Friends	**0.31**	**0.44**	**0.11**	**[.22, .66]**	0.06	0.05	0.03	[-.01, .11]
Respect	**0.3**	**0.44**	**0.12**	**[.16, .45]**	0.12	0.12	0.08	[-.03, .27]
Side With	**0.28**	**0.37**	**0.08**	**[.21, .53]**	**0.41**	**0.38**	**0.08**	**[.21, .55]**
Social Network Centrality	**0.19**	**0.2**	**0.07**	**[.07, .33]**	-0.08	-0.05	0.04	[-.13, .02]
Social Network Prestige	-0.02	-0.01	0.01	[-.10, .07]	**0.14**	**0.02**	**0.01**	**[.05, .23]**
Bullying Perpetration	-0.04	-0.06	0.08	[-.16, .07]	**0.5**	**0.51**	**0.14**	**[.31, .70]**
Aggression Perpetration	-0.04	-0.04	0.06	[-.15, .07]	**0.25**	**0.19**	**0.08**	**[.03, .35]**
Bullying Victimization	-0.05	-0.06	0.07	[-.19, .07]	-0.01	-0.01	0.02	[-.05, .04]
Aggression Victimization	0.08	0.08	0.06	[-.05, .20]	0.13	0.09	0.05	[-.01, .20]
Defended	**0.26**	**0.38**	**0.1**	**[.15, .38]**	0.04	0.03	0.04	[-.04, .11]
Defender	**0.24**	**0.37**	**0.11**	**[.13, .35]**	**0.24**	**0.25**	**0.08**	**[.10, .37]**

Note. All analyses controlled for age, gender, and baseline level of received nominations at Time 1. Power was assessed at Time 1. Peer nominations were assessed 6 months later at Time 2. All significant effects are bolded; 95% confidence intervals that did not cross over zero were used to determine significant effects.

DISCUSSION

Overall, our results demonstrate that adolescents have independent conceptions of the two forms of social power, cooperative and coercive, and that each are composed of both power seeking and power holding aspects. As captured by our measure of social power these two forms also had distinct patterns of associations with positive peer regard and peer conflict that largely supported our predictions (see Table 1). These relationships were somewhat attenuated, but otherwise generally persisted, across a 6-month timespan. The two forms of power were modestly related to each other, suggesting that some individuals use a combination of the two strategies. This agrees with centuries-old views arguing that the pursuit of power can involve both cooperative and coercive methods[6].

Starting with our measure, our univariate correlations showed a distinct pattern of relationships for each form of social power. Broadly speaking, as predicted, cooperative social power was more positively related to prosocial outcomes, while the reverse was true for coercive social power. These differences were reinforced by our confirmatory factor analysis that showed high loadings of the four intended items on each form of social power. These loadings agree with the existing adolescent [34, 76] as well as adult[10] literatures about the dual nature of social power. Where our measure differs from previous measures is its integration of both power-enhancing and power-holding items. The strong loadings for both forms of power argue that the literature should consider measures that incorporate both aspects when trying to capture social power. They also reinforce the idea that power-enhancing processes and power-holding characteristics are strongly related to each other. Interestingly, cooperative social power was most strongly associated with the aspects of cooperation and fairness (power-enhancing aspects), while coercive social power was strongly related to the aspects of getting what one wanted and being popular (power-holding aspects). As we did not statistically test or theoretically predict this, we suggest that this differential weighting of aspects for each form is something that future research might wish to explore in greater depth. Beyond its theoretical value, our measure appears to have reasonable preliminary psychometrics in terms of its reliability and validity.

Concurrent Associations with Positive Peer Regard

As predicted, both forms of social power were positively related to peers' ratings of attractiveness. Thus, the expected "good guy/girl" versus "bad guy/girl" links to attractiveness

were both supported, explaining the enduring comparison of the two types in popular culture and suggesting that both cooperation and dominance can be attractive to potential partners. It would be interesting for future research to determine if there are different audience characteristics associated with being attracted to cooperative versus coercive social power.

In contrast to their joint relationship with attractiveness, as expected, civility was very strongly positively related to cooperative social power and weakly negatively related to coercive social power (see Figure 3). These findings suggest that peers view the expression of cooperative power as strongly aligning with civil, polite behavior while (to a lesser degree) the opposite is true for coercive social power. It would appear that the mutualistic sharing of power is associated with investing the time and energy required to be polite and courteous, presumably as a means of securing mutualistic relationships[7]. In contrast, coercive social power may benefit from doing away with that investment of time and energy at the expense of being perceived by peers as being rude and uncivil. The exceptionally strong links between civility and cooperative power raise the possibility that civility is in fact an aspect of that form of social power and not its outcome. This is a plausible explanation that should be tested in future models as it suggests that part of being cooperative is displaying a willingness to incur the costs associated with generating socially acceptable behavior[77].

Also as predicted, friendship nominations were associated with cooperative, but not coercive, social power. This result fits with the reciprocal nature of the former and the lack of reciprocity in the latter, as reciprocity lies at the heart of children's developing concept of friendship[78] and is essential to ensuring mutual benefits in cooperative relationships[22]. This is a clear benefit of cooperative power, but it is worth noting that coercive social power wasn't negatively related to having friends, so it doesn't appear to exert a significant cost on friendships. Rather, it appears to lack the benefits of cooperative social power.

The fact that some people are still interested in forming social alliances with coercive social power users is demonstrated by our data on respect and siding/allying with someone. As expected, peers strongly respected the cooperative use of power compared to modest associations with coercive power. This finding supports the idea that while coercion can inspire a fearful kind of respect[24], true cooperation promotes a deeper level of admiration and prestige[7]. Somewhat surprisingly then, the reverse was true of the links to peer nominations of who would the peer group form alliances with. While one might think that the reciprocity inherent in cooperative power would engender more support[79], our data suggest that the ability to selfishly exploit power for one's own benefit might trigger people to want to be on the same winning side of a conflict or to benefit with the positive externalities associated with coercive social power[20]. This differs from previous research linking prosocial strategies to alliances[54], possibly because our current data capture not just power-enhancing processes, but also power-holding aspects of coercive social power. This juxtaposition is perhaps even more interesting given that cooperative social power (alone) was associated with social network centrality and prestige. As with the finding for friendship nominations, this suggests that cooperation is more effective in building concurrent friendly coalitions, even if the general peer group views more coercive individuals as being sided with more often. It may be that coercive individuals are more likely to use their social networks to engage in conflicts and thus peers witness coercive individuals being sided with in conflict more often than cooperative social power users who might avoid conflict more broadly.

Concurrent Associations with Peer Conflict

Consistent with our predictions, the avoidance of conflict is reflected in the negative association between cooperative social power and bullying (see Figure 4). There was a small, unexpected, positive association between cooperative power and non-bullying aggression, suggesting that cooperative coalitional aggression, near-peer rivalry, or even aggression against more powerful opponents, may be associated with cooperative power. These explanations are supported by our data showing a strong link between cooperative power and defending others, as defending can involve direct confrontations[64]. Interestingly, the lack of reported victimization did not preclude peers saying that they helped defend cooperative power users, perhaps as an expression of the general reciprocity and solidarity that underlies cooperation. Overall, cooperative social power seems to be mostly associated with primarily defensive behavior with the possible exception of non-bullying aggression.

In contrast, coercive social power was very strongly associated with bullying perpetration and strongly associated with non-bullying aggression (see Figure 4), suggesting that competition often requires the use of force to get others to change their behavior. Bullying, in particular, appears to be a key behavior associated with coercive social power, likely due to its focus on exploiting power for individual gain[56]. The aggressive nature of coercive power may explain why coercive power also was associated with bullying and non-bullying victimization. High-powered individuals can be targets if they are engaging in competition with and/or alienating others through their own aggression[60], so coercive social power's association with aggression appears to be double-edged. While aggression (and bullying in particular) may offer benefits to the perpetrator, it also comes with costs[80], while victimization almost certainly entails further costs to coercive strategies[81]. There also were modest associations between coercive social power and both defending others and being defended. As noted earlier, while defending behavior is a prosocial behavior (as per its association with cooperative social power), it can also represent a coercive attempt to control the social group[63] and it is associated with popularity and aggressive defending [62, 64]. Similarly, being defended may not reflect a voluntary sacrifice, but rather peers defending a coercive social power user could be the result of desiring the benefits of associating with a powerful victim and/or avoiding potential punishment should they not come to the aid of/side with the coercive social power wielder[35].

Peer Positive Regard and Conflict Associations Over Six Months

With regards to longer-term outcomes, perhaps the most interesting overall observation from our data (see Table 3) is that our peer-nominated associations became more uniquely associated with one form of social power versus the other. Civility, friendship, respect, social network centrality, and being defended remained associated with cooperative social power six months later, reinforcing the reciprocity and mutual benefits that underlie cooperative social power. In contrast, attractiveness, and especially bullying and general aggression, remained associated with coercive social power, highlighting the competitive nature of coercive power, its potential appeal to sexual partners, and its usefulness in denigrating competitors [43, 54]. Interestingly, social network prestige switched from being associated with cooperative to being associated with coercive power. Perhaps this reflects an underlying desire associated with coercive power to seek out powerful connections or for peers to side with coercive social power users as a means of avoiding their aggressive behavior or benefitting from their positive externalities[60]. Also interesting was that both forms of social power were moderately associated with defending others. In the case of cooperative social power this likely reflects a

reciprocal commitment to helping allies, whereas for coercive social power it more likely reflects a desire to gain or maintain status by controlling the social group[64].

The final longer-term result was a moderate and a moderate-large association between cooperative and coercive social power respectively and peer nominations of others siding with them in a conflict. It seems that both types of social power represent viable pathways to securing group support. Coercive social power may be associated with more individualistic gains (e.g., attractiveness), while cooperative social power may be associated with more communal gains (e.g., friendships and respect), yet both forms offer some kind of evolutionarily-meaningful peer-supported benefits. This highlights how both forms could have both evolved and been maintained over evolutionary history- they offer some similar, but mostly different, benefits that are likely to be more or less valuable based on different individual and environmental contexts. In some contexts (e.g., shorter-term horizons; zero-sum competitions), coercive power may be more adaptive than cooperative power and vice-versa. Thus, the expression of adolescent social power is likely to be the result of a complex interplay of individual and environmental factors that alter the capacity of an individual to hold social power as well as the costs and benefits of expressing that social power. In this way, both RCT strategy theorists[76] and power-holding theorists [34] were partly correct, they simply lacked an integrated measure of both aspects of social power.

An intriguing side-note is that both forms of social power appeared to have potential drawbacks (e.g., being involved with aggression, getting respect versus being supported). These mixed outcomes may explain why some adolescents appear to choose to eschew either form of social power[76]. Being agnostic with respect to social power may be adaptive in that it saves time and energy pursuing social power while also avoiding any of the negative associations with social power. If the actual (rather than peer-perceived) benefits of either form are small, then it may pay off to refrain from pursuing either. This is a possibility that warrants further attention from the literature.

LIMITATIONS, FUTURE DIRECTIONS, AND CONCLUSIONS

There are several limitations to our study that lessen its generalizability to broader populations and stronger conclusions. To begin with, our data are correlational and thus it is difficult to say whether the associations between social power and peer outcomes were due to the expression of social power or social network conditions set up by peers. Ideally, experimental work should supplement adolescent reports to better understand causal certainty. Additionally, while we offer data over time, it may be that some of the costs and benefits associated with each form of social power take longer than six months to emerge. For example, the benefits of maintaining a strong and cohesive group of friends for many years is a potential benefit of cooperative social power that we could not analyze. Furthermore, with only two times points were not able to look at developmental trends. Also, while we controlled for gender and age in our analyses, we lacked the sample size necessary to separately analyse our data according to gender and age. Further, future studies could aim to explore other potential associations with each form of power (e.g., whether civility is an aspect, or an outcome, or cooperative power). Lastly our sample was drawn from a relatively homogenous sample of adolescents. Caution is warranted in extending our results to forensic or clinical samples, older or younger samples, individuals in targeted minority groups, and particularly samples from countries with different cultural norms and values.

Adolescents appear to view social power as having two aspects and two forms. Similarly, for the most case, peer outcomes were clearly differentiated between the two forms of power, especially data over six months. Our data thus suggest that adolescents are not only aware of the separate nature of each form of social power, they are equally aware of what peer factors they relate to. As one would expect from an evolutionary perspective, our data also support that both factors appear to offer a viable combination of costs and benefits that could be adaptive under varying circumstances. We therefore urge further work to better understand the cooperative and coercive nature of social power in adolescence and its implications for theory, research, and applied practice.

Declaration: The authors have no conflicts of interest to declare. All research was conducted with approval of university and high school research ethics boards. Our data is not publicly available due to ethical restrictions on the use of data from minors. All authors contributed to the conceptualization, writing, and editing of the manuscript, with order of authorship reflecting relative contributions. Dr.'s Volk, Dane, and Craig supplied the funding while Dr.'s Spadafora and Andrews conducted the analyses. We are not able to include our data with our submission due to school board REB restrictions against sharing the data of minors.

Funding Statement: This project was funded by a grant afforded to the first author (details withheld until publication for confidentiality). This research was funded by Social Science and Humanities Research Council of Canada Insight Grant #435-2017-0303.

Ethics statement: All research was conducted with university and school board REB approval.

Competing interests: The authors have no competing interests to declare.

Data availability: Due to the terms of REB approval for using data from minors, our data are not publicly available.

References

[1] Fiske, S. T., and Berdahl, J. L. (2007). Social power. In A. Kruglanski & E. T. Higgins (Eds.), *Social psychology: A handbook of basic principles* (2nd ed., pp. 678–692). Guilford Press.

[2] Andrews, N. C., Cillessen, A. H., Craig, W., Dane, A. V., and Volk, A. A. (2023). Bullying and the abuse of power. *International Journal of Bullying Prevention*, 1-10. https://doi.org/10.1007/s42380-023-00170-0

[3] Exner-Cortens, D., Baker, E., and Craig, W. (2023). Canadian adolescents' experiences of dating violence: Associations with social power imbalances. *Journal of interpersonal violence*, *38*(1-2), 1762-1786. https://doi.org/10.1177/08862605221092072

[4] Mutz, D. C., and Simmons, B. A. (2022). The psychology of separation: Border walls, soft power, and international neighborliness. *Proceedings of the National Academy of Sciences*, *119*(4), e2117797119. https://doi.org/10.1073/pnas.211779711

[5] French, D. C., Shen, M., and Jin, S. (2022). Are adolescent leaders prosocial and aggressive?. *International Journal of Behavioral Development*, *46*(4), 346-357. https://doi.org/10.1177/01650254221100250

[6] Machiavelli, N. (1993). The prince (1513). *Wordsworth Editions*.

[7] Henrich, J., and Gil-White, F. J. (2001). The evolution of prestige: Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, *22*(3), 165-196. https://doi.org/10.1016/S1090-5138(00)00071-4

[8] Gilbert, P. (1997). The evolution of social attractiveness and its role in shame, humiliation, guilt and therapy. *British Journal of Medical Psychology*, *70*(2), 113-147. https://doi.org/10.1111/j.2044-8341.1997.tb01893.x

[9] Raven, B. H., Schwarzwald, J., and Koslowsky, M. (1998). Conceptualizing and measuring a power/interaction model of interpersonal influence. *Journal of Applied Social Psychology*, *28*(4), 307-332. https://doi.org/10.1111/j.1559-1816.1998.tb01708.x

[10] Keltner, D. (2016). *The power paradox: How we gain and lose influence*. Penguin.

[11] Cheng, J. T. (2020). Dominance, prestige, and the role of leveling in human social hierarchy and equality. *Current Opinion in Psychology*, *33*, 238-244. https://doi.org/10.1016/j.copsyc.2019.10.004

[12] Parker, G. A. (1974). Assessment strategy and the evolution of fighting behaviour. *Journal of theoretical Biology*, *47*(1), 223-243. https://doi.org/10.1016/0022-5193(74)90111-8

[13] Axelrod, R., and Hamilton, W. D. (1981). The evolution of cooperation. *Science*, *211*(4489), 1390-1396. https://doi.org/10.1126/science.7466396

[14] Bukowski W.M., Buhrmester D., and Underwood M.K. (2011). Peer relations as a developmental context. In: M. K. Underwood & L. H. Rosen L.H. (eds.). *Social Development: Relationships in Infancy Childhood and Adolescence*. Guilford Press; 2011:153–179

[15] Dawkins, R. (2016). *The selfish gene*. Oxford university press.

[16] Nowak, M. A. (2006). Five rules for the evolution of cooperation. *Science*, *314*(5805), 1560-1563. https://doi.org/10.1126/science.11337

[17] Tong, W., Yang, L., Liu, S., Feng, T., Jia, J., and Zhang, Y. (2023). Popularity goals and bullying behaviors among Chinese adolescents: the moderating roles of popularity status and cognitive empathy. *Youth & Society*, *55*(8), 1501-1519. https://doi.org/10.1177/0044118X22111690

[18] Peets, K., & Hodges, E. V. (2024). The interplay between popularity and aggression in adolescence: Focusing the lens on sense of power and prestige. *Aggressive Behavior*, *50*(6), e22177.

[19] Caravita, S. C., & Cillessen, A. H. (2012). Agentic or communal? Associations between interpersonal goals, popularity, and bullying in middle childhood and early adolescence. *Social Development*, *21*(2), 376-395. https://doi.org/10.1111/j.1467-9507.2011.00632.x

[20] Grosz, M. P., van Aert, R., and Back, M. D. (2024). A meta-analytic review of the associations of personality, intelligence, and physical size with social status. *Psychological Bulletin, 150*(3), 253-283. https://doi.org/10.1037/bul0000416

[21] Bouma, J., Bulte, E., and Van Soest, D. (2008). Trust and cooperation: Social capital and community resource management. *Journal of Environmental Economics and Management*, *56*(2), 155-166. https://doi.org/10.1016/j.jeem.2008.03.004

[22] Axelrod, R. (1980). Effective choice in the prisoner's dilemma. *Journal of Conflict Resolution*, *24*(1), 3-25. https://doi.org/10.1177/002200278002400101

[23] Körner, R., Overbeck, J. R., & Schütz, A. (2025). Structuring hierarchy concepts: Evaluating measures of power, status, dominance, and prestige on the basis of an integrative model and systematic literature review. *Psychological bulletin*, *151*(3), 322-364.

[24] Goltz, S. M. (2020). On power and freedom: Extending the definition of coercion. *Perspectives on Behavior Science*, *43*(1), 137-156. https://doi.org/10.1007/s40614-019-00240-z

[25] Van den Berg, Y. H. M., Burk, W. J., and Cillessen, A. H. N. (2019). The functions of aggression in gaining, maintaining, and losing popularity during adolescence: A multiple cohort design. *Developmental Psychology, 55*(10), 2159–2168. https://doi.org/10.1037/dev0000786

[26] Salmivalli, C. (2010). Bullying and the peer group: A review. *Aggression and Violent Behavior*, *15*(2), 112-120. https://doi.org/10.1016/j.avb.2009.08.007

[27] Tooby, J., and Cosmides, L. (1996, January). Friendship and the banker's paradox: Other pathways to the evolution of adaptations for altruism. In *Proceedings-british academy* (Vol. 88, pp. 119-144). Oxford University Press Inc..

[28] Archer, J. (2009). The nature of human aggression. *International Journal of Law and Psychiatry*, *32*(4), 202-208. https://doi.org/10.1016/j.ijlp.2009.04.001

[29] Roisman, G. I., and Fraley, R. C. (2013). Developmental mechanisms underlying the legacy of childhood experiences. *Child Development Perspectives*, *7*(3), 149-154. https://doi.org/10.1111/cdep.12030

[30] Slobodskaya, H. R. (2021). Personality development from early childhood through adolescence. *Personality and Individual Differences, 172*, 110596. https://doi.org/10.1016/j.paid.2020.110596

[31] Vargas, R. (2011). Being in "bad" company: Power dependence and status in adolescent susceptibility to peer influence. *Social Psychology Quarterly*, *74*(3), 310-332. https://doi.org/10.1177/0190272511414546

[32] Garandeau, C. F., and Lansu, T. A. (2019). Why does decreased likeability not deter adolescent bullying perpetrators?. *Aggressive Behavior*, *45*(3), 348-359. https://doi.org/10.1002/ab.21824

[33] Hawley, P. H. (1999). The ontogenesis of social dominance: A strategy-based evolutionary perspective. *Developmental Review*, *19*(1), 97-132. https://doi.org/10.1006/drev.1998.0470

[34] Van den Berg, Y. H., Lansu, T. A., and Cillessen, A. H. (2020). Preference and popularity as distinct forms of status: A meta-analytic review of 20 years of research. *Journal of Adolescence*, *84*, 78-95. https://doi.org/10.1016/j.adolescence.2020.07.010

[35] Hawley, P. H. (2003). Prosocial and coercive configurations of resource control in early adolescence: A case for the well-adapted Machiavellian. *Merrill-Palmer Quarterly*, 279-309. http://www.jstor.org/stable/23096057

[36] Hawley, P. H., Little, T. D., and Card, N. A. (2007). The allure of a mean friend: Relationship quality and processes of aggressive adolescents with prosocial skills. *International Journal of Behavioral Development*, *31*(2), 170-180. https://doi.org/10.1177/0165025407074630

[37] Hawley, P. H., Little, T. D., and Card, N. A. (2008). The myth of the alpha male: A new look at dominance-related beliefs and behaviors among adolescent males and females. *International Journal of Behavioral Development*, *32*(1), 76-88. https://doi.org/10.1177/0165025407084054

[38] Reijntjes, A., Vermande, M., Olthof, T., Goossens, F. A., Vink, G., Aleva, L., and van der Meulen, M. (2018). Differences between resource control types revisited: A short term longitudinal study. *Social Development*, *27*(1), 187-200. https://doi.org/10.1111/sode.12257

[39] Hartl, A. C., Laursen, B., Cantin, S., and Vitaro, F. (2020). A test of the bistrategic control hypothesis of adolescent popularity. *Child Development*, *91*(3), 635-648. https://doi.org/10.1111/cdev.13269

[40] Zhou, W., and McLellan, R. (2021). Examining social status profiles with gender, school attended, SES, academic achievement and wellbeing in urban China. *Journal of Youth and Adolescence*, *50*(7), 1464-1477. https://doi.org/10.1007/s10964-021-01454-8

[41] Redhead, D., Dhaliwal, N., and Cheng, J. T. (2021). Taking charge and stepping in: Individuals who punish are rewarded with prestige and dominance. *Social and Personality Psychology Compass*, *15*(2), e12581. https://doi.org/10.1111/spc3.12581

[42] Urbaniak, G. C., and Kilmann, P. R. (2006). Niceness and dating success: A further test of the nice guy stereotype. *Sex Roles*, *55*, 209-224. https://doi.org/10.1007/s11199-006-9075-2

[43] Arnocky, S., and Vaillancourt, T. (2012). A multi-informant longitudinal study on the relationship between aggression, peer victimization, and dating status in adolescence. *Evolutionary Psychology*, *10*(2), 253-270. https://doi.org/10.1177/147470491201000207

[44] Bower, A. R., Nishina, A., Witkow, M. R., and Bellmore, A. (2015). Nice guys and gals finish last? Not in early adolescence when empathic, accepted, and popular peers are desirable. *Journal of Youth and Adolescence*, *44*, 2275-2288. https://doi.org/10.1007/s10964-015-0346-5

[45] Dane, A. V., Marini, Z. A., Volk, A. A., and Vaillancourt, T. (2017). Physical and relational bullying and victimization: Differential relations with adolescent dating and sexual behavior. *Aggressive behavior*, *43*(2), 111-122. https://doi.org/10.1002/ab.21667 Dane, A. V., Marini, Z. A., Volk, A. A., and Vaillancourt, T. (2017). Physical and relational bullying and victimization: Differential relations with adolescent dating and sexual behavior. *Aggressive behavior*, *43*(2), 111-122. https://doi.org/10.1002/ab.21667

[46] Farrell, A. H., and Vaillancourt, T. (2019). Temperament, bullying, and dating aggression: Longitudinal associations for adolescents in a romantic relationship. *Evolutionary Psychology*, *17*(2), 1474704919847450. https://doi.org/10.1177/1474704919847450

[47] Rebellon, C. J., and Manasse, M. (2004). Do "bad boys" really get the girls? Delinquency as a cause and consequence of dating behavior among adolescents. *Justice Quarterly*, *21*(2), 355-389. https://doi.org/10.1080/07418820400095841

[48] Vermande, M. M., Gilholm, P. A., Reijntjes, A. H., Hessen, D. J., Sterck, E. H., and Overduin-de Vries, A. M. (2018). Is inspiring group members an effective predictor of social dominance in early adolescence? Direct and moderated effects of behavioral strategies, social skills, and gender on resource control and popularity. *Journal of Youth and Adolescence*, *47*, 1813-1829. https://doi.org/10.1007/s10964-018-0830-9

[49] Spadafora, N., and Volk, A. A. (2021). Child and Youth Classroom Incivility Scale (CYCIS): Exploring uncivil behaviors in the classroom. *School Mental Health*, *13*(1), 186-200. https://doi.org/10.1007/s12310-020-09405-7

[50] Bukowski, W. M., Hoza, B., and Boivin, M. (1994). Measuring friendship quality during pre-and early adolescence: The development and psychometric properties of the Friendship Qualities Scale. *Journal of Social and Personal Relationships*, *11*(3), 471-484. https://doi.org/10.1177/0265407594113011

[51] Laursen, B., Leggett-James, M. P., and Valdes, O. M. (2023). Relative likeability and relative popularity as sources of influence in children's friendships. *PLoS one*, *18*(5), e0283117. https://doi.org/10.1371/journal.pone.0283117

[52] Parker, J. G., and Asher, S. R. (1993). Friendship and friendship quality in middle childhood: links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*, *29*(4), 611. https://doi.org/10.1037/0012-1649.29.4.611

[53] Wentzel, K. R., Barry, C. M., and Caldwell, K. A. (2004). Friendships in middle school: influences on motivation and school adjustment. *Journal of Educational Psychology*, *96*(2), 195-204. https://doi.org/10.1037/0022-0663.96.2.195

[54] Farrell, A., and Dane, A.V. (2020). Bullying, victimization and prosocial resource control strategies: Differential relations with dominance and alliance formation. *Evolutionary Behavioral Sciences, 14,* 270-283. https://doi.org/10.1037/ebs0000178

[55] Andrews, N. C. (2020). Prestigious youth are leaders but central youth are powerful: What social network position tells us about peer relationships. *Journal of Youth and Adolescence*, *49*, 631-644. https://doi.org/10.1007/s10964-019-01080-5

[56] Volk, A. A., Dane, A. V., & Marini, Z. A. (2014). What is bullying? A theoretical redefinition. *Developmental Review*, *34*(4), 327-343.

[57] Prabaharan, N., Dane, A. V., and Spadafora, N. (2024). Balance of Power in Peer Victimization: The Role of Rivalry and Vulnerability. *Canadian Journal of School Psychology*, *39*(2), 170-188. https://doi.org/10.1177/08295735241237910

[58] Wang, S., Lambe, L., Huang, Y., Liu, X., Craig, W., and Zhang, L. (2023). Perceived social competition and school bullying among adolescents: The mediating role of moral disengagement. *Current Psychology*, *42*(28), 24554-24563. https://doi.org/10.1007/s12144-022-03515-y

[59] Park, I., and Cho, S. (2021). Influences of target congruence and lifestyles on victimization trajectories: An autoregressive latent trajectory modeling approach to overlap between bullying and victimization. *Journal of Adolescence*, *92*, 57-74. https://doi.org/10.1016/j.adolescence.2021.08.005

[60] Andrews, N. C., Hanish, L. D., Updegraff, K. A., Martin, C. L., and Santos, C. E. (2016). Targeted victimization: Exploring linear and curvilinear associations between social network prestige and victimization. *Journal of Youth and Adolescence*, *45*, 1772-1785. https://doi.org/10.1007/s10964-016-0450-1

[61] Dawes, M., and Malamut, S. (2020). No one is safe: victimization experiences of high-status youth. *Adolescent Research Review*, *5*(1), 27-47. https://doi.org/10.1007/s40894-018-0103-6

[62] Van der Ploeg, R., Kretschmer, T., Salmivalli, C., and Veenstra, R. (2017). Defending victims: What does it take to intervene in bullying and how is it rewarded by peers?. *Journal of School Psychology*, *65*, 1-10. https://doi.org/10.1016/j.jsp.2017.06.002

[63] Yang, Y., Liang, W., Zhang, Y., and Wang, C. (2024). The longitudinal effect of peer-nominated popularity on defending behaviors in Chinese adolescents: the moderating role of manipulative traits, desired popularity, and gender. *Journal of Youth and Adolescence*, *53*(3), 581-594. https://doi.org/10.1007/s10964-023-01927-y

[64] Lambe, L. J., and Craig, W. M. (2020). Peer defending as a multidimensional behavior: Development and validation of the Defending Behaviors Scale. *Journal of School Psychology*, *78*, 38-53. https://doi.org/10.1016/j.jsp.2019.12.001

[65] Volk, A. A., Veenstra, R., and Espelage, D. L. (2017). So you want to study bullying? Recommendations to enhance the validity, transparency, and compatibility of bullying research. *Aggression and Violent Behavior*, *36*, 34-43. https://doi.org/10.1016/j.avb.2017.07.003

[66] Volk, A. A., Schiralli, K., Spadafora, N., Buchner, K., and Dane, A. V. (2021). Cooperative versus coercive dominance strategies: relations with the environment and personality. *Evolutionary Psychological Science*, *7*, 134-150. https://doi.org/10.1007/s40806-020-00264-8

[67] Booth, A., and Nolen, P. (2012). Choosing to compete: How different are girls and boys?. *Journal of Economic Behavior & Organization*, *81*(2), 542-555. https://doi.org/10.1016/j.jebo.2011.07.018

[68] Dreber, A., Von Essen, E., and Ranehill, E. (2014). Gender and competition in adolescence: task matters. *Experimental Economics, 17*, 154-172. https://doi.org/10.1007/s10683-013-9361-0

[69] Vaillancourt, T., Hymel, S., and McDougall, P. (2003). Bullying is power: Implications for school-based intervention strategies. *Journal of Applied School Psychology*, *19*(2), 157-176. https://doi.org/10.1300/J008v19n02_10

[70] Bonacich, P. (1987). Power and centrality: A family of measures. *American journal of sociology*, *92*(5), 1170-1182.

[71] Reynolds, A. D., & Crea, T. M. (2015). Peer influence processes for youth delinquency and depression. *Journal of adolescence*, *43*, 83-95.

[72] Wasserman, S. (1994). Social network analysis: Methods and applications. *The Press Syndicate of the University of Cambridge*.

[73] Muthén, B., & Muthén, L. (2017). Mplus. In *Handbook of item response theory* (pp. 507-518). Chapman and Hall/CRC.

[74] Kline, P. (2015). *A handbook of test construction (psychology revivals): introduction to psychometric design*. Routledge.

[75] Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

[76] Hawley, P. H. (2014). Ontogeny and social dominance: A developmental view of human power patterns. *Evolutionary Psychology*, *12*(2), 318-342. https://doi.org/10.1177/147470491401200204

[77] Volk, A. A., Mitchell, R. C., & Khan, T. (2019). The power of civility: A transdisciplinary examination of adolescent social power and bullying. *Journal of Childhood Studies, 44*(3), 120-138.

[78] Laursen, B., and Hartup, W. W. (2002). The origins of reciprocity and social exchange in friendships. *New Directions for Child and Adolescent Development, 95*, 27–40.

[79] Charlesworth, W. R. (1996). Co-operation and competition: Contributions to an evolutionary and developmental model. *International Journal of Behavioral Development*, *19*(1), 25-38. https://doi.org/10.1177/016502549601900103

[80] Volk, A. A., Dane, A. V., and Al-Jbouri, E. (2022). Is adolescent bullying an evolutionary adaptation? A 10-year review. *Educational Psychology Review*, *34*(4), 2351-2378. https://doi.org/10.1007/s10648-022-09703-3

[81] Zwierzynska, K., Wolke, D., and Lereya, T. S. (2013). Peer victimization in childhood and internalizing problems in adolescence: a prospective longitudinal study. *Journal of Abnormal Child Psychology*, *41*, 309-323. https://doi.org/10.1007/s10802-012-9678-8