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CONCEPTUALIZING SOCIAL POWER IN ADOLESCENCE

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF PSYCHOLOGY

BY THE COMMITTEE CONSISTING OF

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Acknowledgments

To set the scene: I'm writing this on a beautiful Spring day on the (presumed) tail-end of a global pandemic, birds are chirping, and I'm wondering if I can maybe squeeze in a quick nap before my next meeting. 2020 was certainly a stumbling point for many, and I'm very thankful for all of you who—maybe against my will at the time—kept me marching along towards the doctoral finish line.

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Alright, on to the show:

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Abstract

Popularity in adolescence has been of interest to researchers for decades—oft described and conceptualized as social power, yet few studies have investigated the overlap between popularity and social power outside of Vaillancourt and Hymel (2006). This dissertation explores the extent to which popularity is synonymous with social power by examining three research questions: (1) to replicate research done by Vaillancourt and Hymel (2006), (2) to measure the convergence between an indirect construct of power in the vein of Vaillancourt and Hymel with a new, sociometrically consistent, direct measure of power, and (3) to look at the unique contributions of power to the prediction of peer-reported prosocial and antisocial behaviors. This study used a longitudinal middle school sample of 314 7th and 8th graders. Sociometric and self-report data were collected as part of a larger research project in the Fall of 2019. Results suggest that while Vaillancourt and Hymel's original model was sound, a single, direct measure of power most strongly explained the variance of popularity above and beyond the indirect measures of power. The effects of power on prosocial and antisocial are moderated by gender after controlling for popularity.

Keywords: Popularity, Social Power, Adolescence, Measurement

Conceptualizing Social Power in Adolescence:

Adolescence is a developmental period in which an increased importance is placed on peer relationships (Brown, 2011; Rubin, Bukowski, & Laursen, 2009). Early adolescence is also a time in which peer status begins to play a larger role in their thoughts and behaviors: adolescents begin to prioritize status over other social, personal, and academic aspects (LaFontana & Cillessen, 2010). Popularity has been of interest to researchers for decades. While initially defined and measured as an index of an individual's acceptance by his or her peer group (Peery, 1979; Coie, Dodge, & Coppotelli, 1982; Newcomb, Bukowski, & Patee, 1993), contemporary measures of popularity indicate a form of status that is defined by being well-known, socially visible, and influential in the peer group, and describes a peer group that consists of adolescents who vary in terms of their level of peer acceptance (Cillessen & Marks, 2011; LaFontana & Cillessen, 2002). In essence, popularity is a measure of… popularity: one who is well-known in their peer group (Cillessen & Marks, 2011). A strength of the current study is to focus and identify what, exactly, is being measured when we study popularity—is it indeed status and influence?

One of the things that makes popularity so interesting is the Jekyll-Hyde phenomena reported across many studies: popular adolescents are described as prosocial (Kornbluh & Neal, 2016), funny (Vaillancourt & Hymel, 2006), cool (Hoff, Reese-Weber, Schneider, & Stagg, 2009; Kiefer & Wang, 2016), non-submissive (Gorman, Kim, & Schimmelbusch, 2002), "fun" (Laursen, Altman, Bukowski, & Wei, 2020) and attractive to their peers (Borch, Hyde, & Cillessen, 2010). Popular youth *also* tend to engage in antisocial behaviors such as relational and physical aggression (Cillessen & Mayeux, 2004; Cillessen & Borch, 2006; Loflin & Barry, 2016; Rose, Swenson & Waller, 2004; van den Berg, Burk, & Cillessen, 2019), and engage in more

risk-taking behaviors, such as smoking (Mayeux, Sandstrom, & Cillessen, 2008) or drinking alcohol (La Greca, Prinstein, & Fetter, 2001; Teunissen, Spijkerman, Prinstein, Cohen, Engels, & Scholte, 2012). It should be noted that while there are some adolescents whose profiles are characterized by both prosocial and antisocial behaviors (occasionally referred to as bi-strategic controllers; Hawley, 2003), it is more common that popular youth are either prosocial and generally liked *or* aggressive and generally disliked (de Bruyn & Cillessen, 2006; Rodkin, Farmer, Pearl, & van Acker, 2000; LaFontana & Cillessen, 2002).

Despite these antisocial behaviors and risks, there still remains a desire among some youth to attain popular status (Dawes & Xie, 2014; Cillessen & Caravita, 2012; Li & Wright, 2014). However, even though there are desires among *some* adolescents to become popular, not everyone has that particular status goal (Li & Wright, 2014; van den Broek, Deutz, Schoneveld, Burk, & Cillessen, 2016). For those adolescents who do value popularity, there is an interesting link such that those who strive for popularity behave more aggressively than those who do not have that goal (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009; Dawes & Xie, 2014; Cillessen, Mayeux, Ha, de Bruyn, & La Fontana, 2014). Cillessen and colleagues (2014) found that adolescents who highly prioritize popularity showed higher levels of aggressive behaviors than lower-status adolescents and adolescents who do not prioritize popularity. Ryan and Shim (2008) found that adolescents whose goals involved being seen as socially desirable were more aggressive and less prosocial than adolescents who did not prioritize these goals; these goals also positively correlated with popularity itself, as measured via a three-item popularity subscale of the self-report Interpersonal Competence Scale (e.g., Cairns, Leung, Gest, & Cairns, 1995). The authors suggest that perhaps popularity itself encourages adolescents to behave in a manner consistent with being cool, or popular. This was further seen in a regression model that showed

that adolescents with social desirability "approach goals" were negatively associated with prosocial behaviors, implying that being "nice" was incongruent with rising to the top of the middle school hierarchy. Lee & Yeager (2020) found that adolescents who had higher social status demonstration goals (those who endorsed the importance of being seen as popular) were more willing to engage in relationally aggressive behaviors. These effects were also seen in elementary-aged children: Rodkin and colleagues (2013) used similar measures in a longitudinal sample of 3rd through 5th graders and found that approach goals were positively correlated with later aggressive behaviors and negatively correlated with later prosocial behaviors. Highly visible groups are associated with behavior changes associated with maintaining status, such as self-reported deviant behaviors, misconduct, relational aggression, and prosociality (Ellis & Zarbatany, 2007).

What remains unclear is *what* popularity actually means to adolescents, both personally and interpersonally. It has been generally assumed by researchers that popularity is synonymous with the concept of social power (see: Bowker & Etkin, 2014; Caravita & Cillessen, 2012; Mayeux & Cillessen, 2008; Cillessen, Mayeux, Ha, De Bruyn, & La Fontana, 2014; Closson, 2008; Ojanen & Findley van Nostrand, 2014; Rose, Swenson, & Waller, 2004; Kraft & Mayeux, 2018). Lease, Kennedy, and Axlerod (2002) have suggested that popularity is a "key factor" in determining social power, while Hawley (2003) suggested that being among the most visible peer groups is associated with having increased power, which she defined as access to social resources like friendships. Popularity has also been described as having power when describing and justifying popular youth's hierarchical positioning among their peers. Bukowski (2011) equates popularity and social power (emphasis mine), "*Popularity is a form of status.* ***As a form of status, it is a form of power.*** *Popular children are valued by the group, presumably for their*

contributions to group functioning." That popular youth are indeed awarded relative social power by their peers would help explain an increased focus and importance placed on visibility and status in adolescence. There is some evidence to suggest that during adolescence there is increased importance placed on social rewards (Blakemore & Mills, 2014) and peer recognition (Blakemore, 2018). Popular youth, being among the most visible members of the peer system (Hawley, 2003; Lansu, Cillessen, & Karremans, 2014), hold a lot of influence over their peers. Popularity is also positively correlated with measures of social impact, which is measured by combining the sum of Least-Like nominations with Most-Like nominations and is an index of social visibility and peer recognition (Chen, 2005, as cited in Cillessen, 2009; Cillessen & Marks, 2011). Eder (1985) suggested that being associated with high-status groups affords greater access to social recognition, relationships, and resources than low status groups.

One way in which popular youth might capitalize on their influence is through others' endorsements of their behaviors *because* of their status. For example, Brechwald and Prinstein (2011) have suggested that beyond pure homophily, adolescents are able to influence each others' behaviors and endorsements through other avenues, including status. In other words, beyond just simply doing what your friend says because you two have a lot in common, you may pick up smoking because you saw a popular kid do it. Cohen and Prinstein (2006) showed that adolescents are more likely to behave antisocially and even endorse deviant attitudes if they believed that those same actions had been endorsed by high-status peers. Note that these influential behaviors are not always negative: Choukas-Bradley, Giletta, Cohen, and Prinstein (2015) found that youth endorsed more prosocial behaviors, both publicly and privately, in an online-chatroom manipulation when they believed they were interacting with high-status peers (compared to when they believed their peers were of low status). Regarding alcohol consumption

norms, adolescents conform to either pro-alcohol or anti-alcohol norms depending on which viewpoint the high-status group in their grade endorses (Teunissen, Spijkerman, Prinstein, Cohen, Engels, & Scholte, 2012).

Additionally, adolescents tend to want to be friends with their high-status peers more than low-status peers (Thomas & Bowker, 2013). Thomas and Bowker (2013) looked at desired friendships among groups of middle school adolescents and found that adolescents expressed the desire to become friends with peers who were popular, aggressive, and well-liked. They suggest that this desire may serve as a way for the non-popular adolescent to increase their own relative standing: by becoming friends with popular adolescents in their grade, they too can have all the social rewards that the popular crowd does. This particular idea—one that suggests that social proximity to status can lead to gains in popularity—has been described as "basking in reflected glory" (Cialdini & Richardson, 1980). There is empirical support for this idea: Dijkstra and colleagues (2010) found that adolescents who affiliated with their popular peers had their own status enhanced by proxy. These influential effects of status are not limited to in-person behaviors: Sherman and colleagues (2016) found that adolescents viewing social media (in this case, Instagram) were more likely to endorse (via "liking") an image that more of their peers have liked than those with relatively fewer likes.

Taking these findings together, it is clear that popularity status is coveted among adolescents. To be popular means that one is awarded certain behavioral freedoms by the peer group in return for elevating the status of those near (Bukowski, 2011). Popular youth also clearly hold some influence over the norms and trends of their peer group. Equating popularity and social power feels natural, but what, exactly, is power?

Defining Power

The assumption that the constructs of popularity and social power are synonymous has rarely been measured in the adolescent literature (but see Vaillancourt & Hymel, 2006). However, the adult literature on power suggests that these constructs (social power and popularity) may indeed be as similar as assumed despite the lack of research in adolescents, based on how adults with social power behave interpersonally.

Broadly, power refers to an individual's capacity to modify another person's state by providing or withholding resources or punishments (Keltner, Gruenfeld, & Anderson, 2003). In theory, power is related to, but distinct from, three other concepts: authority, dominance, and status. Distinction comes from the viewpoint that you can theoretically have any one of these four concepts without necessarily having the others. For example, authority refers to an individual's institutionalized roles (CEOs vs middle-managers), yet power can exist outside of formal roles: it is not necessary to have a title to hold power. Dominance refers to interpersonal behaviors that lead to power, but one can obtain power sans behavioral dominance (e.g., U.S. elections are not determined by feats of strength). Finally, status refers to the respect or admiration afforded by others (i.e., prestige; Anderson, Hildreth, & Howland, 2015). This should still be distinct from power, because one can have status without power (a "deadbeat dad" still has the status of "father" yet may not have much power), and one can have power over others without status. In addition to the definitions provided by Keltner and colleagues, power is distinctive from leadership, as leadership requires other tasks such as planning, organization, and problem solving (Yukl et al., 1990). While power can be viewed as conceptually distinct from each of these constructs, it should be noted that they remain related to each other (Anderson & Brion, 2014).

Thus, the theoretical underpinnings of power tend to highlight or emphasize its distinctiveness from other related concepts. Furthermore, adult studies of power show fairly similar patterns to behavioral antecedents of popularity in adolescents. For example, Cislak, Cichocka, Wojcik, and Frankowska (2017) found that self-reported power over others (measured via a single item) significantly predicted self-reported verbal aggression (measured via a 5-item subscale of verbal aggression; Buss & Perry, 1992) towards others. This aggression by those in power is thought to be a by-product of an approach-inhibition theory of power, which suggests that as power increases, individuals engage in more approach behaviors, while low power is associated with inhibition behaviors (Keltner et al., 2003; Cho & Keltner, 2020). A host of research supports this theory: power in adults is further associated with an increased capacity to be true to themselves, meaning that powerful adults tend to not particularly worry about others' points of views or even advice (Krauss, Chen, & Keltner, 2011; See, Morrison, Rothman, & Soll, 2011).They also tend to overestimate how others are feeling, for example, believing that an individual feels happier than they actually feel, and show a reduced capacity to take the perspective of others (Galinsky, Magee, Inesi, & Gruenfeld, 2006), especially when disapproval is directed their way (Van Kleef et al., 2012). Van Kleef and colleagues (2008) showed that individuals who rate themselves as having high power showed less compassion towards others when they described a time in their lives when they experienced suffering or distress. Magee and Smith (2013), consistent with their social distance theory of power, found that the powerful feel *more* emotionally distanced from those without power than the other way around, and suggest that this social distancing ("othering") is why we tend to see less empathy towards others among the powerful. This corroborates research on popularity in adolescence: where we see that popular youth are more aggressive than their unpopular peers and that popularity significantly predicts

bullying behaviors (proactive, unprovoked aggression towards others), particularly in boys (de Bruyn, Cillessen, & Wissink, 2010). It may indeed be the case that popular youth feel entitled in their aggressive behaviors through this "othering" mechanism. This sense of entitlement may indeed feel warranted by their peer experiences: bullies are often popular with peers, bullying predicts peer perceptions of coolness, and bullies report having more positive peer interactions compared to non-bullies (see Mayeux & O'Mealey, 2020, for a review).

Possessing power has also been associated with being able to resist influence from others more easily (Magee & Smith, 2013), and similarly, lacking power is associated with being more susceptible to influence (Keltner et al., 2003). It is important to note that other researchers suggest that power and influence are not equivalent, as influence represents behaviors meant to obtain compliance with a request (Cialdini & Goldstein, 2004). They go on to suggest that power represents a source of potential influence. Yet still, the empirical connection between power and influence has been around for decades. Kipnis (1972), while investigating the corrupting effects of powerholders, suggested that those who control resources then use their power to influence others.

Like adolescents, not every adult desires power (e.g., "passive coalitions;" Mintzberg, 1984), but those who do desire power actively seek out positions of authority or increase their visibility in a way to showcase their skills (Anderson & Brion, 2014). In a similar vein, Van Doesum and colleagues (2013) showed through a series of studies that there are individual differences in the willingness to impose one's choices on others, which appear to be related to prosocial orientation. Magee and Langner (2008) showed that individuals with a personalized (i.e., "selfish") drive for power behaved in antisocial ways, while in a second study showed that individuals with a socialized (i.e., "other-oriented") drive for power behaved in prosocial ways.

Côté and colleagues (2011) found that prosocial individuals were more empathically accurate in high power situations than non-prosocial individuals, suggesting that goal orientation plays a role in how power manifests itself (see the aforementioned adolescent literature that suggests that those with popularity goals aggress in similar patterns as popular youth themselves).

Studies of social power have found that those with social power are indeed goal-oriented to the point of tuning-out outside information not immediately relevant to their goal, while those without power are more susceptible to non-goal-related activities (Guinote, 2007; Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012). Neurological studies of those with power showed that individuals primed with power showed reduced "Motor-Evoked Potential" activity (considered to be indicative of other-directed cognition) compared to participants in low-power or neutral conditions (Hogeveen, Inzlicht, & Obhi, 2014). Paulmann & Uskul (2017) looked at the differences in how high and low power individuals processed emotional sounds. They found that there was indeed a difference in the neurological responses to emotional prosody such that low power individuals showed significant neural modulation activity in response to different acoustic attributes while those with power did not show these differences—implying further that low power individuals may be more focused on details than those with high power. It is important to note here that the differences in the neurological responses between high power and low power individuals may depend on the type of scenario they are in, as not all potential empathic situations show differences between high and low power (Ma, Wu, & Zhang, 2019).

Still, there is remains a link between antisocial behaviors and power. It has been shown that behaving in dominant ways can lead to perceptions of workplace competence (Anderson & Brion, 2014). However, it should also be noted that Casciero and Lobo (2008) showed that individuals who adhered towards dominance behaviors and strategies for a task were less-liked

by partners than those who behaved prosocially. These social norms (i.e., being nice) are often broken by power holders, who break norms more often and engage in less conformity than non-power holders (Galinsky, 2008), and perhaps it is by breaking these social norms that individuals are ascribed power by others (Van Kleef, Homan, Finkenauer, Blaker, & Heerdink, 2012). Note that Van Kleef and colleagues (2012) found that power was afforded to individuals when the norm violation benefitted others as well, which perhaps can be conceptually tied back towards adolescent "bi-strategic controllers:" having the social savvy to know when to be aggressive and when to be prosocial in order to boost one's standing in the peer group is positively associated with popularity (e.g., Hawley, 2003).

From There to Here: Power in Adolescents

Taking the adult literature on power into account, and then looking back in time towards adolescence, there appears to be a similar link between status and behavior throughout the lifespan. Perhaps the approach-inhibition theory of power is why we see increased aggression alongside increased social status in adolescents. For example, there is fairly consistent evidence that as popularity increases, so does aggression (Prinstein & Cillessen, 2003; Cillessen & Mayeux 2004; Rose & Rudolph, 2006; Borch & Cillessen; Mayeux, Sandstrom, & Cillessen, 2008; Faris & Felmlee, 2011). (To be clear, in some samples, this effect is not present; e.g., Hawley, Little, & Card, 2007). This pattern of increased aggression is also seen in youths who seek and desire popularity among their peers (Dawes & Xie, 2014; Li & Wright. 2014; Cillessen & Caravita. 2012; Cillessen, Mayeux, Ha, de Buryn, & La Fontana, 2014; Ojanen & Findley van Nostrand, 2014). Interestingly, popular youth who are aware of their status are among the most aggressive (Mayeux & Cillessen, 2008), which also parallels research on adults that suggest that those with power also show increased aggression (Anderson & Brion, 2014). These studies all

interchangeably describe the similar constructs of status and social power, yet it is not fully clear if adolescents *themselves* view these constructs as distinct. Do adolescents believe that popular youth hold power? The goal of this research is to test the assumption in the adolescent peer relationships literature that popularity is considered social power not only by researchers, but by adolescents themselves.

Summary and Prospectus:

Despite the frequent assumption that popularity is a measure of social power, few—if any—studies have empirically addressed specific measures of social power. The only study to date that has measured power and status separately in adolescence is by Vaillancourt and Hymel (2006), who measured popularity and also measured a construct of social power. They reasoned that social power should be divvyed into two types: implicit power (i.e., status), in which an individual's power is subtle, and explicit power (which they refer to as power), which describes explicit behaviors used to maintain or attain power and a measure of peer perceptions. Using a single-item sociometric measure of popularity (*Who are the most popular people in your grade?*) and a composite three-item sociometric measure of power (*Who seems to have a lot of power over others?*', *Who is a person other kids will listen to and follow?*, and *Who is a leader?*), they found a strong correlation between power and popularity (overall sample correlation = .8; boys = .85; girls = .75).

The study by Vaillancourt and Hymel looked to see how peer-valued characteristics (e.g., being cool, athletic, wealthy) moderated how peer status influences aggression. However, they did not measure how power influences positive behaviors. Additionally, to measure power, they used a three-item composite of power—two indirect items and one direct—yet they did not measure power in the same manner as they measured popularity (e.g., by asking who was *most*

powerful). To date, there is not a single study that has directly investigated social power in adolescents via a straightforward sociometric methodology. The current research aims to fill a gap in the existing literature by assessing the extent to which popularity is synonymous with power. To do this, three aims were pursued: (1) to validate and improve upon the 3-item composite of power created by Vaillancourt and Hymel (2006), (2) to measure the convergence between the 3-item composite of power with a new, sociometrically consistent measure of power, and (3) looking at the unique contributions of power in peer-reported prosocial and antisocial behaviors, above and beyond that of popularity.

Research Questions and Hypotheses:

Proposed Analyses

As the goal here is to ascertain what power means to adolescents (and during adolescence), analyses were run to answer broad questions such as "is power a distinct enough construct to be included in future sociometric studies?" and specific questions such as "is power uniquely associated with overt aggression in adolescence above and beyond that of popularity?"

Research Question 1:

Are the three items used to capture power in Vaillancourt & Hymel (2006) able to be validated and improved upon?

The first proposed analysis was to run a confirmatory factor analysis model to replicate the peer-valued characteristics that Vaillancourt and Hymel used to constitute the construct of social power Using MPlus, we used the same sociometric items that Vaillancourt and Hymel (2006) used to see if the observed values they claimed were social power fit a cohesive construct (as measured via factor loadings and model fit indices) in a new sample, and if not, we sought to

add or subtract other sociometric items to see if model fit could improve. Thus, the purpose was twofold: (1) to replicate the initial model and see how "good" it is, and (2) improve it.

The measures that Vaillancourt & Hymel used were a combination of a direct measure of power: "Who seems to have a lot of power over others?'', and two indirect measures of power: ''Who is a person other kids will listen to and follow?'', and ''Who is a leader?" These items were measured in Wave 2 of our Clinton Data collection (details regarding the sample are under methods). Additional items we considered including to optimizing a model were two additional indirect items of power: "who stands up for themselves?" and "who has influence over others?" By adding and subtracting items into the CFA structure, keeping the minimum number of items at 3, we were able to look at standardized factor loadings and model fit indices (i.e., SRMR, CFI, TLI, Chi Square, and RMSEA) to determine how well these original items load onto the latent construct of power. Additionally, as able, we ran chi-square deviance tests on each model to test the extent to which these models are significantly different. The final model will be one that has the best relative model fit indices and will be used for further analyses.

Research Question 2:

To what extent do the multi-item construct and two-item construct converge and diverge with each other and with popularity?

The second research question looked to compare two different constructs of social power: a multi-sociometric construct from RQ1 and a simpler, two-item construct more in-line with existing sociometric items (such as acceptance, which is an individual's standardized score of most liked nominations minus standardized score of least liked nominations) and how they relate to popularity. The goal was to see the extent to which these two models are similarly—or dissimilarly—related to popularity and to each other, as well as see whether a direct of measure

of power explains more variance of popularity than an indirect composite. The purpose of this research question was twofold: (1) to test whether adolescents *themselves* view "power" (measured via peer nominations of *most powerful* and *least powerful*) as meaning the same thing as the previous study's assumptive construct of power (i.e., three-item construct, or any new model created in the previous research question), and (2) to test whether a two-item measure of power, in line with the traditional sociometric methodology, is sufficient enough as a strong predictor of popularity. Cillessen and Marks (2011) suggest that more items in a construct improve the construct's reliability, but in practice, sociometric researchers must balance psychometric concerns with the realities of collecting data in schools, and often choose to use one or two items per construct to avoid the potential fatigue effects associated with long sociometric batteries.

Thus, in this research question we ran a correlation between the two power constructs to see the amount of variance shared between them (rule of thumb correlations suggests that correlations of .5 indicate a strong association; Cohen, 1988; and at least one study suggests that correlations as large as .3 should be re-conceptualized as having a relatively strong relationship; Gignac & Szodorai, 2016). Next, we ran multiple hierarchical regression models predicting popularity where one of the power constructs acts as the X variable at step one, and the other construct is added at step two to test the extent to which adolescent definitions of social power (the two-item construct) align with researchers' definitions of social power (the multi-item construct). If at step two, in both model scenarios, the addition of the other power construct explains significant additional variance, it implies that adolescents' definitions of social power are different than researchers' definitions. If *only* the addition of the multi-item construct significantly improves the amount of variance explained, it suggests that either the two-item

construct is too narrow (i.e., construct underrepresentation; Messick, 1995) or perhaps the multi-item construct is too broad (construct overrepresentation; Messick, 1995)—this difference in interpretation will depend on the strength of the relationship we find.

Research Question 3:

Does power uniquely contribute to the prediction of prosocial or antisocial behaviors above and beyond popularity?

The third analysis tested whether power uniquely contributes to specific outcome variables above and beyond the variance explained by popularity. We know that popularity is associated with prosocial and antisocial behaviors, and tends to be moderately associated with peer acceptance (van den Berg, Lansu, & Cillessen, 2020). Thus, the final analyses test ed whether power *uniquely* contributes towards these associations. For example, are adolescents viewing power as associated with relational aggression, but not prosocial behavior? Multiple hierarchical linear regression analyses were run to answer these questions: we looked at the relationships between popularity and (1) prosocial behavior, (2) peer acceptance (3) overt aggression, (4) relational aggression, (5) social impact, and (6) gender typicality, where popularity acted as the independent variable and the aforementioned variables are individual dependent variables and added the direct measure of power at step two. By adding power as the hierarchical piece, we were able to determine the extent to which power uniquely contributes to peer acceptance, peer visibility, prosocial, and antisocial behaviors. Finally, in this research question, I looked at the moderating effect of gender and how it affects perceptions of power on the relationship between these extant variables: it may be the case that power predicts physical aggression above and beyond that of popularity in boys, where in girls power is a stronger predictor of gender typicality. Gender differences as they relate to popularity have previously

been reported in outcomes such as peer acceptance, relational aggression, and overt aggression (Cillessen & Mayeux, 2004). However, it is important to note that these gender differences are not always observed in every sample (Rose, Glick, & Smith, 2011). Thus, it is worthwhile to extend the research as it relates to gender differences.

Methods

Participants

Participants were 314 middle school students with sociometric data from a school-based study of peer relationships. The sociometric data were provided by 151 7th and 8th grade students from a rural middle school in the Midwest who completed a battery of sociometric and self-report items in return for small prizes and candy. Participants had signed parental consent, and the participants themselves also provided their assent to participate on survey days. Data were collected in the Fall of 2019. Sociometric and self-report data were all collected in the same period on the same day.

The sociometric items and self-report survey were completed by 151 (48% of the school body) 7th and 8th graders (79 girls; 69 boys; 3 non-identified gender; 85 7th graders; 66 8th graders). The student body consisted of N = 314 middle schoolers,162 girls, 149 boys, 3 non-identified gender, 171 7th graders, and 143 8th graders. Thus, approximately 50% of enrolled 7th graders and 46% of enrolled 8th graders participated. Because all students in the school were included on the sociometric rosters regardless of participation, peer nomination data is available for the entire school (i.e., 314 students).

Procedure

For data collection, the research team visited the school site to inform students about the upcoming study and to answer questions they had about participation. Parental consent forms were gathered from parents at multiple times, such as parent-teacher conferences. For Wave 2, consent forms were gathered and signed in the Fall of 2019. On the days of the assessments, the students who had received consent from their parents were called from their classrooms to the designated assessment room (either the cafeteria or the school library). Once participants gave assent to be studied, student rosters that assigned a code number to each student in the grade were passed out. Data were collected via an online survey developed in Qualtrics. Students used school-issued computers to access the survey. After walking the participants through the first sociometric item and answering any questions, researchers then monitored the participants as they completed the remainder of the survey items.

Measures

Sociometric methods were used to measure each construct included in analysis. For each sociometric item, participants were asked to click on their code number on the computer screen. We allowed for unlimited same- and cross-sex nominations; we did not allow for self-nominations—any self-nominations were removed during analyses.

Popularity.

For popularity, participants were asked to nominate the peers in their grade who are "most popular" and the peers who are "least popular". Each of these items were standardized within each grade to have a mean of 0 and a standard deviation of 1 to control for sample size differences between grades. These items were then combined and restandardized to form a continuous measure of popularity by subtracting an individual's standardized *Least Popular*

score from their standardized *Most Popular* score and this difference score was then re-standardized to give a single score for popularity.

Social Power.

Several sociometric items were used to address social power and each item was standardized within grade. These variables include “influence” (write down the names of all the peers in your grade who “hold influence over others”), “leaders” (“are leaders”), “listen & follow” (“others listen to and follow”), and “stands up for self” (“stand up for themselves”).

Two final items relating to peer power were measured by directly asking participants to identify the peers in their grade who “have the most power over others” and the peers in their grade who “have the least power over others.” Similar to popularity, these two items were combined to form a continuous measure of power by subtracting an individual’s standardized *Least Powerful* score from their standardized *Most Powerful* score and this difference score was then re-standardized to yield a single score for power.

Peer Acceptance.

Two peer nomination items were used to measure acceptance. The first item asked the participants to identify their peers who they “like the most” and the second item asked the participants to identify their peers who they “like the least.” These items were combined to form a continuous measure of acceptance by subtracting an individual’s standardized *Least Liked* score from their standardized *Most Liked* score. This difference score was then re-standardized to yield a single score for acceptance.

Overt Aggression.

Two peer nomination items were used to measure overt aggression. The first item asked the participants to identify their peers who “tease kids, call them names, and yell at others,” and

the second item asked the participants to identify their peers who “hit, shove, kick, or push others”. These two items were standardized within each grade, and a continuous measure of overt aggression was made by averaging the standardized numbers of nominations received for the two overt aggression items.

Relational Aggression.

Two peer nomination items were used to measure relational aggression. The first item asked the participants to identify their peers who “exclude others from their group,” and the second item asked the participants to identify their peers who “spread rumors or gossip about other kids”. These two items were standardized within each grade, and a continuous measure of relational aggression was made by averaging the standardized numbers of nominations received for the two relational aggression items.

Prosocial Behavior.

Two peer nomination items were used to measure prosocial behavior. The first item asked the participants to identify their peers who were “kind and trustworthy,” and the second item asked the participants to identify their peers who were “helpful”. These two items were standardized within each grade, and a continuous measure of prosocial behavior was made by averaging the standardized numbers of nominations received for the two prosocial behavior items.

Gender Typicality.

A single item for each gender was used to measure gender typicality. Gender typicality has been proposed as a key feature of popularity: that popularity is ascribed to those who behave in gender-typical ways in adolescence (Kleiser & Mayeux, 2020). The gender typicality items asked the participants to identify their peers who are “most masculine” (for boys) and “most

feminine" (for girls). Boys and girls only received scores for the item corresponding with their gender: boys do not have a "feminine" score and girls do not have a "masculine" score. These items were standardized within each grade, and feminine and masculine scores were combined into a single column called *gender typicality*.

Results

Preliminary Analyses

The correlations, means, and standard deviations between all variables of interest can be found in Table 1. Correlations, means, and standard deviations split by gender can be found in Table 2. As each variable of interest had been standardized prior to analysis, means and standard deviations are typically around 0 and 1, respectively.

Testing Competing Models of Social Power

Confirmatory factor analyses were employed using Mplus version 8. Four competing models of social power were tested. These models were created by combining measures of social power to form new constructs called *Composite Peer Power*, meant to compare with and extend the Vaillancourt and Hymel measure of power. Vaillancourt and Hymel took the mean score of their three sociometric items ("Who seems to have a lot of power over others?'', ''Who is a person other kids will listen to and follow?'', and ''Who is a leader?") to create their composite. The same was done here, adding and subtracting additional items as deemed reasonable through model fit indices. The purpose of testing these four models was to determine if Vaillancourt and Hymel had originally used a good-fitting model of social power that can extend to a different sample, and then to see if there is a more efficient or good-fitting model that can better capture the construct of social power.

The first model was based on Vaillancourt and Hymel's (2006) model of social power, and included three items: Most Power, Listen To and Follow, and Leader. The second model tested five items: Most Power, Listen To and Follow, Leader, Influence, and Stands Up for Themselves. The third model tested four items: Listen To and Follow, Leader, Influence, and Stands Up for Themselves. The fourth model tested three items: Listen To and Follow, Leader, and Influence. Each of these models was treated as a single factor model, where the latent variable of interest was one of social power.

Table 3 presents a summary of fit statistics for each model, along with standardized factor loadings for each variable. Models 1 and 4, having only three factor loadings apiece, were able to be estimated normally under Mplus, but were "just identified," indicating that the models had zero degrees of freedom. Accordingly, these models are unable to be directly compared against the other models through most model fit indices and should instead be judged on factor loadings, AIC and BIC model fits, and through deviance tests with other models.

Looking at the standardized factor loadings, Model 1 fit the factor well: the factor loadings of Most Powerful (r = .87), Listen and Follow (r = .97), and Leader (r = .89) were each strongly correlated with the latent factor. The fit indices available, the AIC (1861.42) and BIC (1895.14), were relatively low compared to the next two models. These results indicate that the composite metric used by Vaillancourt and Hymel (2006) is an appropriately cohesive measure and that it can generalize to a different sample.

Model 2 sought to expand the number of items used to try and increase the model fit. Model 2 fit the data moderately well: χ^2/df = 3.21, CFI = .99, TLI = .99, RMSEA = .08 [.04, .13]. The fit indices of AIC (2876.49) and BIC (2932.69) were both quite a bit larger than Model 1. Each of the standardized factor loadings were strong: Most Powerful (r = .87), Listen and Follow

(r = .95), Leader (r = .91), Influence (r = .93), and Stands Up for Themselves (r = .74) all had strong correlations with the latent factor, with the weakest being Stands Up for Themselves. The deviance test between Model 1 and Model 2 was not significant ($\Delta\chi^2$ = 16.07, Δdf = 5, *ns*) which suggests that the addition of multiple items did not significantly improve the model fit.

Model 3 looked to see if model fit could be improved by removing the direct item "Most Powerful." As previously stated, Vaillancourt and Hymel (2006) used a combination of direct and indirect items in their initial composite. For the purpose of future analyses, it was important to explore the possibility of creating a good-fitting, indirect composite that did not include an explicit measure of power. Model 3 fit the data slightly better than Model 2: χ^2/df = 2.81, CFI = 1.00, TLI = .99, RMSEA = .08 [.00, .15], AIC = 2380.01, and BIC = 2424.97. A Chi-square difference test found that Models 2 and 3 did *not* significantly differ ($\Delta\chi^2$ = 10.46, Δdf = 3, *ns*), which indicates that the added item (Most Powerful) in Model 2 does not significantly improve model fit. Thus, the four-item Model 3 is better according to the fit indices. The standardized factor loadings remained strong: Listen To and Follow (r = .94), Leader (r = .92), Influence (r = .94), and Stands Up for Themselves (r = .74) each significantly loading on to the latent factor.

Model 4 looked to address the relatively weak factor loading of Stands Up for Themselves by removing it from the model, while still keeping the factor loadings as indirect items. Much like Model 1, Model 4 was "just identified" with zero degrees of freedom, with the only fit indices AIC (1714.78) and BIC (1748.50) indicating a slightly better fit than Model 1. The factor loadings were all very strong: Listen To and Follow (r = .93), Leader (r = .92), and Influence (r = .95) all significantly loaded onto the latent factor. The deviance test between Model 3 and Model 4 was not significant ($\Delta\chi^2$ = 5.62, Δdf = 2, *ns*) which suggests again that the simpler model is a better fit of the data.

Testing Direct vs Indirect Measures of Social Power

Hierarchical linear regressions were used to investigate whether a single, direct measured item of social power would explain more variance in popularity than an indirect composite. For these analyses, at step one I ran a simple linear model where one measure of power predicted popularity, and at step two I added the other measure of power to see if it explained additional unique variance. For example: at step one, I predicted popularity from the three-item indirect measure of power. At step two I added the direct measure of power and looked at ΔR^2 to determine the amount of variance each item attributed. From RQ 1, there were two indirect composites that fit the data well but were unable to directly compare with each other beyond deviance and AIC and BIC: Model 3 and Model 4. Thus, for the following regressions I compared both indirect (composite) measures of power against the direct measure of power when predicting popularity. Table 4 shows the associations between these variables at each step.

In both cases, the direct measure of social power explained variance in popularity above and beyond that of the indirect measures. Note that in each regression, the addition of *either* the direct or indirect measure at step two significantly improved the variance explained, but the direct measure explained more variance than the 3-item (Direct: $\Delta R^2 = .20$, $p < .001$; 3-Item: $\Delta R^2 = .05$, $p < .001$) and the 4-item composite measure (Direct: $\Delta R^2 = .20$, $p < .001$; 3-Item: $\Delta R^2 = .06$, $p < .001$) in each case. These results imply that when adolescents are nominating popular and powerful peers, they tend to nominate similar peers, whereas when nominating indirect traits that are *conceptually related* to power there is more unexplained variance. A follow-up analysis found that the 4-item measure marginally significantly predicted popularity above and beyond that of the 3-item ($\Delta R^2 = .012$, $p = .011$).

Additionally, a mediation analysis was run in order to test the possibility that the direct measure of power mediates the relationship between the 3-item construct of indirect power and popularity. Using the Hayes Process Model version 3.5.3 in SPSS, the model's estimation was bootstrapped 5000 times. The model showed partial mediation, as the indirect effect's 95% confidence interval [.07, .13] and the direct effect's 95% confidence interval [.09, .16] both showed a significant association with popularity. The total model was significant (r = .7816, R^2 = .61, F = 240.96, p < .001).

Finally, an SEM model was run in order to explore the associations between the 3-item latent factor and the directly measured items (popularity and power). The latent factor correlated significantly with both popularity (r = .657, p < .001) and direct power (r = .627, p < .001). Popularity correlated significantly with direct power (r = .75, p < .001).

The Effects of Power on Outcomes of Interest

A series of hierarchical linear regressions was run to determine the extent to which social power predicted variance in several outcome variables above and beyond the variance explained by peer-nominated popularity. These outcome variables (Social Preference, Prosocial Behavior, Overt Aggression, Relational Aggression, Social Impact, and Gender Typicality) all have well-established associations with popularity (Cillessen, Schwartz, & Mayeux, 2011). In addition, gender was tested as a moderator of the association between social power and the outcome variables. The goal of these analyses was to use a direct measure of power to explore the extent to which power uniquely contributes towards adolescent understanding of these variables.

In each of the analyses below, gender was added at step 1, popularity was added at step 2, power was added at step 3, and a gender*power interaction was added at step 4. Significant gender interaction terms were probed in the manner described by Aiken and West (1991), in

which prototypical plots of the relation between power and the outcome variable were created for both boys and girls. Simple slopes were also calculated for each regression line. Tables 5 – 10 show the unstandardized betas at each step for each outcome variable.

Power Predicting Social Preference

In the hierarchical model predicting social preference, at step 1, gender was a significant predictor (B = .329, p = .004), with girls having higher social preference than boys. In step 2, popularity explained significantly more variance (ΔR^2 = .115, p = .000) in social preference, and this model accounted for approximately 13% of the total variance of social preference. In step 3, the addition of power did not explain significant additional variance (ΔR^2 = .002, p = .350), implying that overall, power is not an additional predictor of social preference above and beyond that of popularity. In step 4, gender was found to significantly moderate the relationship between power and social preference (ΔR^2 = .031, p = .001). This model accounted for roughly 16% of the variance of social preference. Figure 1 shows the moderating relationship, where a simple slopes test found that for girls, as power increased, social preference decreased (B = -.261, p = .01) whereas for boys, there was not a significant relationship between power and social preference (B = .096, p = .312).

Power Predicting Prosocial Behavior

In the hierarchical model predicting prosocial behavior, at step 1, gender was a significant predictor (B = .423, p = .000), with girls having higher peer-nominated prosocial behavior. In step 2, popularity explained additional variance (ΔR^2 = .157, p = .000) in prosocial behavior, and this model accounted for approximately 20% of the total variance of prosocial behavior. In step 3, the addition of power explained a significant amount of additional variance (ΔR^2 = .012, p = .031). In step 4, gender was found to significantly moderate the relationship

between power and prosocial behavior (ΔR^2 = .046, p = .000). This model accounted for roughly 25% of the variance of prosocial behavior. Figure 2 shows the moderating relationship, where a simple slopes test found that for boys, as power increased, prosocial behavior decreased (B = -.346, p = .000) whereas for girls, there was not a significant relationship between power and prosocial behavior (B = .057, p = .299).

Power Predicting Overt Aggression

In the hierarchical model predicting overt aggression, at step 1, gender was a significant predictor (B = -.428, p = .000), with boys having higher scores for peer-nominated overt aggression. In step 2, popularity explained significantly more variance (ΔR^2 = .108, p = .000) in overt aggression, and this model accounted for approximately 15% of the total variance of overt aggression. In step 3, the addition of power did not explain additional variance (ΔR^2 = .002, p = .399). In step 4, gender was found not to moderate the relationship between power and prosocial behavior (ΔR^2 = .000, p = .745).

Power Predicting Relational Aggression

In the hierarchical model predicting relational aggression, at step 1, gender was a significant predictor (B = .313, p = .003), with girls having higher scores for peer-nominated relational aggression. In step 2, popularity explained significant variance (ΔR^2 = .224, p = .000) in relational aggression, and this model accounted for approximately 25% of the total variance of relational aggression. In step 3, the addition of power explained significantly more variance than the previous model (ΔR^2 = .034, p = .000). In step 4, gender was found to moderate the relationship between power and relational aggression (ΔR^2 = .063, p = .000). This model accounted for roughly 34% of the variance of relational aggression. Figure 3 shows the moderating relationship, where a simple slopes test found that for boys, as power increased,

relational aggression stayed the same (B = .044, p = .599) whereas for girls, as power increased, relational aggression also increased (B = .515, p = .000).

Power Predicting Social Impact

In the hierarchical model predicting social impact, at step 1, gender was not a significant predictor (B = .204, p = .180). In step 2, popularity explained significant variance (ΔR^2 = .206, p = .000) in social impact, and this model accounted for approximately 21% of the total variance in social impact. In step 3, the addition of power did not explain more variance than the previous model (ΔR^2 = .001, p = .548). In step 4, gender was found to moderate the relationship between power and social impact (ΔR^2 = .346, p = .000). This model accounted for roughly 24% of the variance of prosocial behavior. Figure 4 shows the moderating relationship, where a follow-up simple slopes test found that for boys, as power increased, social impact decreased (B = -.307, p = .013) whereas for girls, there was not a significant relationship between power and social impact (B = .207, p = .113).

Power Predicting Gender Typicality

In the hierarchical model predicting gender typicality, at step 1, gender was not a significant predictor (B = .089, p = .439). In step 2, popularity explained significant variance (ΔR^2 = .505, p = .000) in gender typicality, and this model accounted for approximately 50% of the total variance of gender typicality. In step 3, the addition of power marginally significantly explained more variance than the previous model (ΔR^2 = .007, p = .036). In step 4, gender did not moderate the relationship between power and social impact (ΔR^2 = .004, p = .113). This model accounted for roughly 51% of the variance of prosocial behavior.

Discussion

The purpose of this study was threefold: (1) to replicate and extend the associations between the 3-item sociometric composite of power and popularity to corroborate previous work done by Vaillancourt and Hymel (2006), (2) to measure the convergence between the 3-item sociometric composite of power with a newer sociometric measure of power that is consistent with existing measures of popularity in order to test a simpler, direct measure of power, and (3) to look at the unique contributions of power in peer-reported prosocial and antisocial behaviors, above and beyond that of popularity. Broadly, the results suggest that Vaillancourt and Hymel's original composite of power was indeed a strong model and that it was able to replicate in a rural sample; further, the model was able to be improved upon by using only indirect items within the model, rather than the mix of indirect (e.g., *leadership*) and direct (i.e., *has a lot of power over others*). The results also suggest that while the indirect composite measure of power was able to explain some of the variance in popularity, a direct measure of power, measured in a similar sociometric manner as popularity, was a stronger predictor of variance. Finally, the results suggest that above and beyond the variance explained by popularity, power is uniquely associated with both prosocial and antisocial behaviors, and some of these associations are moderated by gender.

For decades, adolescent researchers have largely assumed that popularity and social power are functionally equivalent (e.g., Bukowski, 2011; Mayeux & Cillessen, 2008). Meanwhile, the adult literature has gone through great pains to distinguish power from status (Keltner et al., 2003; Keltner & Cho, 2020). Yet despite the assumptions of adolescence researchers, only a single study to date has explicitly measured social power (Vaillancourt & Hymel, 2006). While Vaillancourt and Hymel found a strong correlation between popularity and

their composite measure of social power, there were limitations in their measure that were addressed in the present study, namely, that the model fit indices and how they derived their model were missing from their methods, and that they used a combination of direct and indirect measures to create their factor. This was inconsistent with how they measured popularity, which was a single sociometric item of "most popular." One of the goals in this study was to replicate their model in a different sample and test possible better-fitting models.

The results showed that the original Vaillancourt and Hymel model of social power was a good-fitting model to the extent that the data software allowed an evaluation of model fit indices. In this case, the AIC and BIC both suggested that this model fit the data *better* than two models that had more items. The best-fitting model, as evidenced by lower AIC and BIC metrics, was a fully indirect model consisting of three items: "Influence," "Others Listen to and Follow," and "Leader." Each of these items' standardized loadings show strong correlations with the latent factor, and generally show a strong sense of uniformity in the adolescents being nominated for these traits.

Conceptually, this makes sense. We should expect that adolescents who have influence others should naturally also be the same peers that others listen to and follow (else, to what extent is there influence at all?), and that these peers may also be seen as leaders among their peers. Taken all together, someone who has these qualities may indeed be thought to hold power relative to his or her peers.

The next steps were to address the extent to which these constructs, an indirect measure of power and a direct measure of power consistent with the measurement of popularity (e.g., *have the most power* and *have the least power*), were able to explain the variance in popularity. I used two indirect models, one with 4 items and one with 3 items, in order to be able to compare

them, as the 3-item model did not produce fit indices outside of the AIC and BIC, making it difficult to compare them directly. The adjusted R^2 of the two models in predicting popularity were functionally equivalent (3-item: .41 vs 4-item: .42), thus best practices suggest that the better fitting model is the simplest, which is also consistent with the AIC and BIC fit indices. Regardless of how well the indirect models predicted popularity, the direct items measuring power substantially predicted popularity above and beyond that of the indirect models. In both cases, the addition of the direct measure of power also *weakened* the relationship between the indirect models and popularity, but follow-up mediation analyses did not show a full mediation effect. These findings suggest that despite the similarities in these constructs (indirect power and direct power), there appears to be some disconnect in how adolescents are viewing these concepts. In any case, adolescents *are* indeed showing a moderate consensus of viewing popular peers as having *power*, even if they are not necessarily viewing popular peers as having the traits assumed to be associated with power—that is to say, there was a stronger relationship between the direct measure of power and popularity than there was with the indirect measure of power and popularity. This may be a byproduct of the bimodality of popularity: one subgroup is well-liked and regarded highly by their peers, the other subset is aggressive and generally disliked (de Bruyn & Cillessen, 2006; Cillessen & Marks, 2011). The concepts of being influential, a leader, and someone that everyone listens to and follows may be inherently positively valanced, meaning that the construct is only tapping into one of the subsets of popularity.

The correlation between direct power and popularity, while strong, still allowed room for power to uniquely predict several behaviors of interest over and above the variance explained by popularity. The final research question looked to expand on what power means to adolescents by measuring its unique effect on several variables of interest: acceptance, prosocial behavior, overt

aggression, relational aggression, social impact, and gender typicality. Each of these constructs has a well-established relationship with popularity (e.g., Cillessen et al., 2011; Kleiser & Mayeux, 2021). By looking at the unique effects of power above and beyond that of popularity, I was able to get a glimpse of what power means to adolescents. Additionally, I explored the extent to which gender moderated the effects of power on the variables of interest.

The results indicate that power significantly explains additional variance in prosocial behaviors, relational aggression, and gender typicality. In the case of prosocial behavior, as an individual's power increases, their peer-rated prosocial behaviors decrease. For relational aggression and for gender typicality, as power increases, so do they. The non-significant effects of power on social preference, overt aggression, and social impact simply suggest that power is not a unique predictor of these behaviors above and beyond that of popularity—in other words, adolescents tend to view popular and powerful peers as essentially equivalent in these behaviors, overall. These results may indicate that adolescents who are viewed as having social power, in addition to their popularity status, are less "nice" than their peers, and that they are more likely to spread rumors/gossip and behave in gender-typical ways. Another way of looking at this is to consider that the adolescents who are behaving gender-typically, are relationally aggressive, and are perceived as less prosocial are leveraging these behaviors to gain social power above and beyond that of just being popular. Perhaps it is the case that beyond status, these types of behaviors are the mechanisms by which social power manifests itself in middle school. Of course, it is important to note that even though these variables explained *significant* variance above and beyond that of power, the actual value change of each R^2 was either approximately 1% (prosocial and gender typicality) or 3% (relational aggression). That is to say, while these effects may be statistically significant, they may not be meaningful differences. Despite the

minimal variance explained, this significant effect does at least partially indicate that while these constructs are indeed similar, there remains some unexplained variance between them.

Finally, I investigated gender as a moderating factor in the relation of power to the outcome variables. I found that gender significantly moderated the effects of power on social preference, prosocial behaviors, relational aggression, and social impact. The non-significance of a moderating effect of gender on overt aggression and gender typicality suggests that boys and girls have similar levels of these attributes regardless of their level of social power. Simple slopes tests show that as power increases, social preference decreases for girls, while boys show no such association. This is consistent with previous popularity research that has shown that popular girls tend to have lower social preference than popular boys (Cillessen & Mayeux, 2004). Interestingly, a simple slopes test on prosocial behavior shows the opposite effect: for girls, power is not significantly related to prosocial behavior, but for boys, as power increases, prosocial behaviors decrease. These results suggest that either having social power encourages middle school boys to behave in more self-serving ways, or that some aspect of being low in prosocial behavior is associated with the ability to garner social power. Taken in tandem with the previous finding that peer acceptance is not associated with power above and beyond the link with popularity, it may be the case that power affords boys the ability to do as they please, as they do not receive social pushback. On the other hand, socially powerful girls are less liked. Of course, there is another possible reason why powerful girls may be less liked than powerful boys: a simple slopes test on relational aggression shows a positive association between power and relational aggression for girls, but not boys. That powerful girls are implicated in behaving in relationally aggressive ways may indicate that they receive increasingly negative attention from their peers. Consistent with this hypothesis, the final moderation effect showed that as power

increased, girls' social impact *increased*, while boys' social impact *decreased*. Taken together, these findings paint an interesting picture, such that powerful girls may have more of a spotlight on them than boys, and as such get judged by their peers more harshly than their powerful male counterparts.

So where does this leave us? The purpose of the study was to test the extent to which popularity and power are equivalent in adolescence. To that end, it successfully showed that these two constructs that had been previously largely assumed to be similar are indeed similar. While power was able to significantly explain more variance in outcome variables over and above that of popularity, the variance added is not meaningful—or rather, the extent to which a 3% variance increase is meaningful may depend on the goals of the researcher. I err on the side of recommending that unless a researcher is particularly interested in re-validating the associations between power and popularity in a new sample, or they are testing power as a byproduct of popularity through a longitudinal study, there is no need to include these measures of power in future studies of popularity.

Of course it should be re-iterated that there was indeed a significant difference between popularity and power. These differences may be a function of how these constructs are mentally represented in adolescents: power itself may be more behavioral (aggression, dominance) compared with the more reputationally-based popularity. Clearly there is overlap between these constructs, but perhaps future studies can tease apart where they diverge.

Strengths, Limitations, and Future Directions

This current research study's primary strength is the validation and support provided for previous research assumptions that social power and popularity are functionally equivalent. Through multiple model comparisons and transparently showing the steps taken to compare

these constructs, it was demonstrated that the associations between popularity and social power are strong enough to consider them equal. An additional strength is the use of multiple informants and the sociometric method—using peers as informants; the gold standard—in measuring every variable of interest, which increases the reliability of the data (Cillessen & Marks, 2011).

The limitations of this study include its correlational design, the percentage of raters, and the cross-sectional nature of data. Regarding the correlational design, while this is typical for sociometric studies, due to the nature of the data we are unable to make causal claims on the effects of power on the outcome variables of interest. This is in contrast to adult studies of power (e.g., Galinsky et al., 2006) that typically take an experimental design when measuring power and its outcomes. The other limitation, the percentage of raters, could have influenced these results. Some sociometric researchers suggest that 60-70% of the total available sample of possible raters should be used in order to keep reliability high (Cillessen & Marks, 2011), yet there is some debate that quality of raters matters more than quantity (Terry, 2000). The current sample represented only about a 50% consent rate. That the results were consistent with previous research suggests that we should not be too concerned for the outcomes of this study, but future research with both larger samples and higher consent rates should validate these findings. Finally, this study used only a cross-sectional design. The ability to utilize time-series analyses could have illuminated more the unique contributions of power to peer status and behavior over time. This is an important direction for future research.

Future studies interested in exploring social power in adolescents can also expand upon the work here by introducing power in longitudinal designs to explore the time-ordered effects of power and popularity. For example, perhaps it is the case that popularity at one time point

predicts an individual's power at a second, suggesting that status is a driver of power in adolescence. Additional future studies can validate power further by using different sociometric approaches, such as G-theory (Shavelson, Webb, & Rowley, 1989), in order parse the sources of variance in indirect measures of power. Finally, future research should explore the extent to which power and popularity differ in self-perceptions. The current research only looked at the associations between *peer-rated* power and *peer-rated* outcome variables, yet it remains unclear if peer-rated powerful adolescents recognize their own power and the extent to which this influences self-reported psychosocial feelings such as hope, self-esteem, academic achievement, or family dynamics.

In conclusion, based on the findings here, it appears that popularity should indeed be considered a form of social power in adolescence—in contrast to studies of power in adulthood, which suggest that these two constructs should be considered distinct (Keltner et al., 2003). Status and power in the peer group are closely linked, and the findings here provide a useful framework in understanding why popular youth show the patterns of visibility, aggression, and prosocial behavior that have emerged in so many studies of adolescents (Cillessen, Mayeux, & Schwartz, 2011).

References

Aiken, L. S., West, S. G., & Reno, R. R. (1991*). Multiple regression: Testing and interpreting interactions.* Sage.

Anderson, C., & Brion, S. (2014). Perspectives on power in organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*(1), 67-97.

Anderson, C., Hildreth, J. A. D., & Howland, L. (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychological Bulletin, 141*(3), 574.

Blakemore, S. J., & Mills, K. L. (2014). Is adolescence a sensitive period for sociocultural processing? *Annual Review of Psychology, 65,* 187-207.

Blakemore, S. J. (2018). Avoiding social risk in adolescence. *Current Directions in Psychological Science, 27*(2), 116-122.

Cillessen, A. H., & Borch, C. (2006). Developmental trajectories of adolescent popularity: A growth curve modelling analysis. *Journal of Adolescence, 29*(6), 935-959.

Borch, C., Hyde, A. & Cillessen, A.H.N. (2010) The role of attractiveness and aggression in high school popularity. *Social Psychology of Education, 14*, 23–39

Bowker, J. C., & Etkin, R. G. (2014). Does humor explain why relationally aggressive adolescents are popular? *Journal of Youth and Adolescence, 43*(8), 1322-1332.

Brechwald, W. A., & Prinstein, M. J. (2011). Beyond homophily: A decade of advances in understanding peer influence processes. *Journal of Research on Adolescence, 21*(1), 166-179.

Brown, B. B. (2011). Popularity in peer group perspective: The role of status in adolescent peer systems. In A. H. N. Cillessen, D. Schwartz, & L. Mayeux (Eds.), *Popularity in the peer system* (pp. 165–192). The Guilford Press.

Bukowski, W. M. (2011). Popularity as a social concept: Meanings and significance. In A. H. N. Cillessen, D. Schwartz, & L. Mayeux (Eds.), *Popularity in the peer system* (p. 3–24). The Guilford Press.

Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology, 63*(3), 452.

Cairns, R. B., Leung, M. C., Gest, S. D., & Cairns, B. D. (1995). A brief method for assessing social development: Structure, reliability, stability, and developmental validity of the Interpersonal Competence Scale. *Behaviour Research and Therapy, 33*(6), 725-736.

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

Casciaro, T., & Lobo, M. S. (2008). When competence is irrelevant: The role of interpersonal affect in task-related ties. *Administrative Science Quarterly, 53*(4), 655–684

Chen, Q (2005). *Convergent and discriminant validity of popularity measures in adolescence.* Unpublished master's thesis, Department of Psychology, University of Connecticut, Storrs, CT.

Cho, M., & Keltner, D. (2020). Power, approach, and inhibition: Empirical advances of a theory. *Current Opinion in Psychology, 33*, 196-200.

Choukas-Bradley, S., Giletta, M., Cohen, G. L., & Prinstein, M. J. (2015). Peer influence, peer status, and prosocial behavior: An experimental investigation of peer socialization of adolescents' intentions to volunteer. *Journal of Youth and Adolescence, 44*(12), 2197-2210.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology, 55,* 591-621.

Cialdini, R. B., & Richardson, K. D. (1980). Two indirect tactics of image management: Basking and blasting. *Journal of Personality and Social Psychology, 39*(3), 406.

Cillessen, A. H. N. (2009). Sociometric methods. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (p. 82–99). The Guilford Press.

Cillessen, A. H., & Borch, C. (2006). Developmental trajectories of adolescent popularity: A growth curve modelling analysis. *Journal of Adolescence, 29*(6), 935-959.

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.

Cillessen, A. H. N., & Marks, P. E. L. (2011). Conceptualizing and measuring popularity. In A. H. N. Cillessen, D. Schwartz, & L. Mayeux (Eds.), *Popularity in the peer system* (p. 25–56). The Guilford Press.

Cillessen, A. H., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between aggression and social status. *Child Development, 75*(1), 147-163.

Cillessen, A. H., Mayeux, L., Ha, T., de Bruyn, E. H., & LaFontana, K. M. (2014). Aggressive effects of prioritizing popularity in early adolescence. *Aggressive Behavior, 40*(3), 204-213.

Cislak, A., Cichocka, A., Wojcik, A. D., & Frankowska, N. (2018). Power corrupts, but control does not: What stands behind the effects of holding high positions. *Personality and Social Psychology Bulletin, 44*(6), 944-957.

Closson, L. M., & Hymel, S. (2016). Status differences in target-specific prosocial behavior and aggression. *Journal of Youth and Adolescence, 45*(9), 1836-1848.

Cohen, G. L., & Prinstein, M. J. (2006). Peer contagion of aggression and health risk behavior among adolescent males: An experimental investigation of effects on public conduct and private attitudes. *Child Development, 77*(4), 967-983.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology, 18*(4), 557.

Côté, S., Kraus, M. W., Cheng, B. H., Oveis, C., Van der Löwe, I., Lian, H., & Keltner, D. (2011). Social power facilitates the effect of prosocial orientation on empathic accuracy. *Journal of Personality and Social Psychology, 101*(2), 217.

Dawes, M., & Xie, H. (2014). The role of popularity goal in early adolescents' behaviors and popularity status. *Developmental Psychology, 50*(2), 489.

De Bruyn, E. H., & Cillessen, A. H. (2006). Popularity in early adolescence: Prosocial and antisocial subtypes. *Journal of Adolescent Research, 21*(6), 607-627.

De Bruyn, E. H., Cillessen, A. H., & Wissink, I. B. (2010). Associations of peer acceptance and perceived popularity with bullying and victimization in early adolescence. *The Journal of Early Adolescence, 30*(4), 543-566.

Dijkstra, J. K., Cillessen, A. H., Lindenberg, S., & Veenstra, R. (2010). Basking in reflected glory and its limits: Why adolescents hang out with popular peers. *Journal of Research on Adolescence, 20*(4), 942-958.

Eder, D. (1985). The cycle of popularity: Interpersonal relations among female adolescents. *Sociology of Education*, 154-165.

Ellis, W. E., & Zarbatany, L. (2007). Peer group status as a moderator of group influence on children's deviant, aggressive, and prosocial behavior. *Child Development, 78*(4), 1240-1254.

Faris, R., & Felmlee, D. (2011). Status struggles: Network centrality and gender segregation in same-and cross-gender aggression. *American Sociological Review, 76*(1), 48-73.

Galinsky, A. D., Magee, J. C., Inesi, M. E., & Gruenfeld, D. H. (2006). Power and perspectives not taken. *Psychological Science, 17*(12), 1068-1074.

Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences, 102*, 74-78.

Gorman, A. H., Kim, J., & Schimmelbusch, A. (2002). The attributes adolescents associate with peer popularity and teacher preference. *Journal of School Psychology, 40*(2), 143-165.

Guinote, A. (2007). Power affects basic cognition: Increased attentional inhibition and flexibility. *Journal of Experimental Social Psychology, 43*(5), 685-697.

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.

Hawley, P. H., Little, T. D., & 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.

Hoff, K. E., Reese-Weber, M., Schneider, W. J., & Stagg, J. W. (2009). The association between high status positions and aggressive behavior in early adolescence. *Journal of School Psychology, 47*(6), 395-426.

Hogeveen, J., Inzlicht, M., & Obhi, S. S. (2014). Power changes how the brain responds to others. *Journal of Experimental Psychology, 143*(2), 755.

Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review, 110*(2), 265.

Kiefer, S. M., & Wang, J. H. (2016). Associations of coolness and social goals with aggression and engagement during adolescence. *Journal of Applied Developmental Psychology, 44*, 52-62.

Kipnis, D. (1972). Does power corrupt?.*Journal of Personality and Social Psychology, 24*(1), 33.

Kleiser, M., & Mayeux, L. (2020). Popularity and Gender Prototypicality: An Experimental Approach. *Journal of Youth and Adolescence*, 1-15.

Kornbluh, M., & Neal, J. W. (2016). Examining the many dimensions of children's popularity: Interactions between aggression, prosocial behaviors, and gender. *Journal of Social and Personal Relationships*, *33*(1), 62-80.

Kraft, C., & Mayeux, L. (2018). Associations among friendship jealousy, peer status, and relational aggression in early adolescence. *The Journal of Early Adolescence*, *38*(3), 385-407.

Kraus, M. W., Piff, P. K., Mendoza-Denton, R., Rheinschmidt, M. L., & Keltner, D. (2012). Social class, solipsism, and contextualism: how the rich are different from the poor. *Psychological Review*, *119*(3), 546.

Kraus, M. W., Chen, S., & Keltner, D. (2011). The power to be me: Power elevates self-concept consistency and authenticity. *Journal of Experimental Social Psychology*, *47*(5), 974-980.

La Greca, A. M., Prinstein, M. J., & Fetter, M. D. (2001). Adolescent peer crowd affiliation: Linkages with health-risk behaviors and close friendships. *Journal of Pediatric Psychology*, *26*(3), 131-143.

LaFontana, K. M., & Cillessen, A. H. (2002). Children's perceptions of popular and unpopular peers: a multimethod assessment. *Developmental Psychology*, *38*(5), 635.

LaFontana, K. M., & Cillessen, A. H. (2010). Developmental changes in the priority of perceived status in childhood and adolescence. *Social Development*, *19*(1), 130-147.

Lansu, T. A., Cillessen, A. H., & Karremans, J. C. (2014). Adolescents' selective visual attention for high-status peers: The role of perceiver status and gender. *Child Development, 85*(2), 421-428.

Laursen, B., Altman, R. L., Bukowski, W. M., & Wei, L. (2020). Being fun: An overlooked indicator of childhood social status. *Journal of Personality, 88*(5), 993-1006.

Lease, A. M., Kennedy, C. A., & Axelrod, J. L. (2002). Children's social constructions of popularity. *Social Development, 11*(1), 87-109.

Lee, H. Y., & Yeager, D. S. (2020). Adolescents with an entity theory of personality are more vigilant to social status and use relational aggression to maintain social status. *Social Development, 29*(1), 273-289.

Li, Y., & Wright, M. F. (2014). Adolescents' social status goals: Relationships to social status insecurity, aggression, and prosocial behavior. *Journal of Youth and Adolescence, 43*(1), 146-160.

Loflin, D. C., & Barry, C. T. (2016). 'You can't sit with us:' Gender and the differential roles of social intelligence and peer status in adolescent relational aggression. *Personality and Individual Differences, 91,* 22-26.

Ma, X., Wu, K., & Zhang, E. (2019). The role of social power in neural responses to others' pain. *Frontiers in Psychology, 10,* 2320.

Magee, J. C., & Langner, C. A. (2008). How personalized and socialized power motivation facilitate antisocial and prosocial decision-making. *Journal of Research in Personality, 42*(6), 1547-1559.

Magee, J. C., & Smith, P. K. (2013). The social distance theory of power. *Personality and Social Psychology Review, 17*(2), 158-186.

Mayeux, L., & Cillessen, A. H. (2008). It's not just being popular, it's knowing it, too: The role of self-perceptions of status in the associations between peer status and aggression. *Social Development, 17*(4), 871-888.

Mayeux, L., & O'Mealey, M. (2020). The Vantage Point of a Bully. In Rosen, L. H., Scott, S. R., & Kim, S. Y. (Eds.) *Bullies, Victims, and Bystanders* (pp. 17-43). Palgrave Macmillan, Cham.

Mayeux, L., Sandstrom, M. J., & Cillessen, A. H. (2008). Is being popular a risky proposition. *Journal of Research on Adolescence, 18*(1), 49-74.

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*(9), 741.

Mintzberg, H. (1984). Power and organization life cycles. *Academy of Management Review, 9*(2), 207-224.

See, K. E., Morrison, E. W., Rothman, N. B., & Soll, J. B. (2011). The detrimental effects of power on confidence, advice taking, and accuracy. *Organizational Behavior and Human Decision Processes, 116*(2), 272-285.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin, 113*(1), 99.

Ojanen, T., & Nostrand, F. V. (2014). Social goals, aggression, peer preference, and popularity: Longitudinal links during middle school. *Developmental Psychology, 50*(8), 2134.

Paulmann, S., & Uskul, A. K. (2017). Early and late brain signatures of emotional prosody among individuals with high versus low power. *Psychophysiology, 54*(4), 555-565.

Peery, J. C. (1979). Popular, amiable, isolated, rejected: A reconceptualization of sociometric status in preschool children. *Child Development*, 1231-1234.

Prinstein, M. J., & Cillessen, A. H. (2003). Forms and functions of adolescent peer aggression associated with high levels of peer status. *Merrill-Palmer Quarterly*, 310-342.

Rodkin, P. C., Ryan, A. M., Jamison, R., & Wilson, T. (2013). Social goals, social behavior, and social status in middle childhood. *Developmental Psychology, 49*(6), 1139.

Rodkin, P. C., Farmer, T. W., Pearl, R., & Van Acker, R. (2000). Heterogeneity of popular boys: antisocial and prosocial configurations. *Developmental Psychology, 36*(1), 14.

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*(1), 98.

Rose, A. J., Swenson, L. P., & Waller, E. M. (2004). Overt and relational aggression and perceived popularity: Developmental differences in concurrent and prospective relations. *Developmental Psychology, 40*(3), 378.

Rubin, K. H., Bukowski, W. M., & Laursen, B. (Eds.). (2009). *Handbook of peer interactions, relationships, and groups.* The Guilford Press.

Ryan, A. M., & Shim, S. S. (2008). An exploration of young adolescents' social achievement goals and social adjustment in middle school. *Journal of Educational Psychology, 100*(3), 672.

Shavelson, R. J., Webb, N. M., & Rowley, G. L. (1989). Generalizability theory. *American Psychologist, 44(*6), 922.

Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M. (2016). The power of the like in adolescence: Effects of peer influence on neural and behavioral responses to social media. *Psychological Science, 27*(7), 1027-1035.

Sijtsema, J. J., Veenstra, R., Lindenberg, S., & Salmivalli, C. (2009). Empirical test of bullies' status goals: Assessing direct goals, aggression, and prestige. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 35*(1), 57-67.

Terry, R. (2000). Recent advances in measurement theory and the use of sociometric techniques. *New Directions for Child and Adolescent Development, 2000*(88), 27-53.

Teunissen, H. A., Spijkerman, R., Prinstein, M. J., Cohen, G. L., Engels, R. C., & Scholte, R. H. (2012). Adolescents' conformity to their peers' pro-alcohol and anti-alcohol norms: The power of popularity. *Alcoholism: Clinical and Experimental Research, 36*(7), 1257-1267.

Thomas, K. K., & Bowker, J. C. (2013). An investigation of desired friendships during early adolescence. *The Journal of Early Adolescence, 33*(6), 867-890.

Vaillancourt, T., & Hymel, S. (2006). Aggression and social status: The moderating roles of sex and peer-valued characteristics. Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 32(4), 396-408.

Van den Berg, Y. H., Burk, W. J., & Cillessen, A. H. (2019). The functions of aggression in gaining, maintaining, and losing popularity during adolescence: A multiple-cohort design. *Developmental Psychology, 55*(10), 2159.

Van den Berg, Y. H., Lansu, T. A., & 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.

Van Den Broek, N., Deutz, M. H., Schoneveld, E. A., Burk, W. J., & Cillessen, A. H. (2016). Behavioral correlates of prioritizing popularity in adolescence. *Journal of Youth and Adolescence, 45*(12), 2444-2454.

Van Doesum, N. J., Van Lange, D. A., & Van Lange, P. A. (2013). Social mindfulness: skill and will to navigate the social world. *Journal of Personality and Social Psychology, 105*(1), 86.

Van Kleef, G. A., Oveis, C., Van Der Löwe, I., LuoKogan, A., Goetz, J., & Keltner, D. (2008). Power, distress, and compassion: Turning a blind eye to the suffering of others. *Psychological Science, 19*(12), 1315-1322.

Van Kleef, G. A., Homan, A. C., Finkenauer, C., Blaker, N. M., & Heerdink, M. W. (2012). Prosocial norm violations fuel power affordance. *Journal of Experimental Social Psychology, 48*(4), 937-942.

Yukl, G., & Falbe, C. M. (1990). Influence tactics and objectives in upward, downward, and lateral influence attempts. *Journal of Applied Psychology, 75*(2), 132.

Table 1. Means, Standard Deviations, and Intercorrelations among variables of interest; Full sample.

	1	2	3	4	5	6	7	8	9	10	11	12
Mean	.01	.00	.01	.01	.01	.01	.01	.01	.01	.00	.01	.00
SD	1.01	1.00	1.00	1.01	.93	1.00	1.00	.94	.93	1.00	1.34	1.00
1. Influence	-											
2. Stands	.75**	-										
3. Leader	.89**	.71**	-									
4. Listen & Follow	.89**	.78**	.89**	-								
5. Prosocial	.66**	.53**	.64**	.64**	-							
6. Power	.74**	.65**	.76**	.77**	.44**	-						
7. Popularity	.74**	.71**	.72**	.73**	.62**	.73**	-					
8. Overt Agg	.24**	.48**	.18*	.28**	-0.04	.40**	.38**	-				
9. Relational Agg	.51**	.61**	.53**	.55**	.18*	.59**	.56**	.68**	-			
10. Acceptance	0.15	0.14	0.16	0.10	.55**	0.02	.20*	-.40**	-.24**	-		
11. Impact	.52**	.63**	.51**	.53**	.48**	.49**	.61**	.52**	.61**	0.03	-	
12. Gender Typicality	.77**	.67**	.78**	.78**	.58**	.63**	.76**	.23**	.63**	0.11	.59**	-

Note. $n = 310$; *$p < .05$; *$p < .01$

Table 2. Means, Standard Deviations, and Correlations among variables of interest; Split by gender.

	1	2	3	4	5	6	7	8	9	10	11	12
Mean (girls)	.11	-.03	.08	.08	.23	.09	.11	-.21	.17	.17	.12	.05
SD (girls)	1.12	.99	1.10	1.14	.93	.98	.98	.59	1.14	.96	1.37	1.01
Mean (boys)	-.09	.04	-.06	-.05	-.20	-.07	-.08	.21	-.15	-.16	-.09	-.04
SD (boys)	.88	1.02	.91	.86	.88	1.01	1.01	1.14	.65	1.02	1.30	1.00
1. Influence	-	.625**	.847**	.854**	.604**	.402**	.462**	.229**	.297**	.374**	.390**	.542**
2. Stands	.751**	-	.634**	.670**	.497**	.256**	.398**	.377**	.338**	.270**	.519**	.542**
3. Leader	.889**	.713**	-	.815**	.683**	.333**	.399**	0.056	.202*	.425**	.287**	.424**
4. Listen & Follow	.899**	.777**	.891**	-	.600**	.453**	.589**	.289**	.423**	.400**	.495**	.633**
5. Prosocial	.661**	.534**	.641**	.636**	-	0.033	.203**	-0.098	0.077	.563**	.305**	.173*
6. Power	.740**	.650**	.764**	.769**	.436**	-	.759**	.247**	.361**	.389**	0.154	.548**
7. Popularity	.739**	.709**	.720**	.730**	.624**	.730**	-	.339**	.414**	.467**	.310**	.667**
8. Overt Agg	.235**	.481**	.182*	.283**	-0.041	.395**	.378**	-	.616**	-.308**	.572**	.511**
9. Relational Agg	.506**	.614**	.530**	.554**	.180*	.594**	.557**	.675**		0.024	.463**	.469**
10. Acceptance	0.148	0.135	0.159	0.097	.546**	0.024	.195*	-.399**	-.241**	-	-0.054	.280**
11. Impact	.521**	.627**	.510**	.529**	.482**	.492**	.609**	.518**	.607**	0.025	-	.481**
12. Gender Typicality	.766**	.672**	.778**	.779**	.575**	.629**	.761**	.233**	.630**	0.114	.593**	-

Note. Girls above the diagonal (n = 161); Boys below diagonal (n = 149); *p < . 05; *p < .01

Table 3. Fit indices and factor loadings for the four CFA Models.

	Model 1	Model 2	Model 3	Model 4
χ^2	0	16.07	5.61	0
df	0	5	2	0
χ^2/df	0	3.21	2.81	0
AIC	1861.42	2876.49	2380.01	1714.78
BIC	1895.14	2932.69	2424.97	1748.50
RMSEA	-	.08	.08	-
90% CI	-	[.04, .13]	[.00, .15]	-
CFI	-	.99	1.00	-
TLI	-	.99	.99	-
SRMR	-	.009	.008	-
Factor Loadings				
Most Powerful	.87	.87	-	-
Listen & Follow	.97	.95	.94	.93
Leader	.89	.91	.92	.92
Influence	-	.93	.94	.95
Stands Up	-	.74	.74	

Note. Models 1 and 4 were just identified with zero *df*, thus many fit indices were unable to be estimated. Standardized factor loadings presented for relative comparisons (all $p = .000$).

Table 4. Predicting popularity from different measures of power

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				. 41**	.41**
Intercept	.00	.08	.94		
3-item power	.22	14.56	.00		
Step 2.				.61**	.20**
Intercept	.00	.04	.97		
3-item power	.10	6.43	.00		
Direct power	.57	12.66	.00		
	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.42**	.42**
Intercept	.00	.08	.93		
4-item power	.18	14.93	.00		
Step 2.				.62**	.20**
Intercept	.00	.04	.97		
4-item power	.09	7.11	.00		
Direct power	.56	12.76	.00		
	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.56**	.56**
Intercept	.00	.06	.95		
Direct power	.75	19.74	.00		
Step 2.				.61**	.05**
Intercept	.00	.04	.97		
Direct power	.57	12.76	.00		
3-item power	.10	6.43	.00		
	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.56**	.56**
Intercept	.00	.06	.95		
Direct power	.75	19.74	.00		
Step 2.				.62**	.06**
Intercept	.00	.04	.97		
Direct power	.56	12.76	.00		
4-item power	.09	7.11	.00		

Note. * $p < .05$; ** $p < .01$; **bold** indicates new items added at each step.

Table 5. Hierarchical Linear Regression Models Predicting Social Preference

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				. 24*	.24*
Intercept	-.489	-2.778	.006		
Gender	.329	2.917	.004		
Step 2.				.136**	.115**
Intercept	-.396	-2.383	.018		
Gender	.264	2.479	.014		
Popularity	.342		.000		
Step 3.				.136**	.002
Intercept	-.398	-2.393	.017		
Gender	.265	2.491	.013		
Popularity	.397	4.967	.000		
Power	-.075	-.935	.350		
Step 4.				.164**	.031**
Intercept	-.393	-2.406	.010		
Gender	.272	2.595	.010		
Popularity	.391	4.966	.000		
Power	.453	2.598	.010		
Gender * Power	-.357	-3.393	.001		

Note. Betas are unstandardized; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

Table 6. Hierarchical Linear Regression Models Predicting Prosocial Behavior

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.049**	.049**
Intercept	-.620	-3.843	.000		
Gender	.423	4.096	.000		
Step 2.				.203**	.157**
Intercept	-.519	-3.502	.000		
Gender	.353	3.715	.000		
Popularity	.371	7.802	.000		
Step 3.				.221**	.012˚
Intercept	-.523	-3.549	.000		
Gender	.356	3.767	.000		
Popularity	.485	6.846	.000		
Power	-.153	-2.165	.031		
Step 4.				.257**	.046**
Intercept	-.528	-3.689	.000		
Gender	.348	3.796	.000		
Popularity	.493	7.151	.000		
Power	-.749	-4.911	.000		
Gender * Power	.403	4.377	.000		

Note. Betas are unstandardized; ˚$p < .05$; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

Table 7. Hierarchical Linear Regression Models Predicting Overt Aggression

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.049**	.049**
Intercept	.644	3.955	.000		
Gender	-.428	-4.107	.000		
Step 2.				.154**	.108**
Intercept	.729	4.725	.000		
Gender	-.487	-4.931	.000		
Popularity	.310	6.268	.000		
Step 3.				.153**	.002
Intercept	.730	4.732	.000		
Gender	-.488	-4.940	.000		
Popularity	.263	3.547	.000		
Power	.063	.845	.399		
Step 4.				.151**	.000
Intercept	.731	4.728	.000		
Gender	-.487	-4.926	.000		
Popularity	.263	3.532	.000		
Power	.110	.671	.503		
Gender * Power	-.032	-.325	.745		

Note. Betas are unstandardized; ˚$p < .05$; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

Table 8. Hierarchical Linear Regression Models Predicting Relational Aggression

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.025*	.025*
Intercept	-.458	-2.800	.005		
Gender	.313	2.989	.003		
Step 2.				.248**	.224**
Intercept	-.337	-2.337	.020		
Gender	.229	2.476	.014		
Popularity	.444	9.600	.000		
Step 3.				.286**	.034**
Intercept	-.331	-2.342	.020		
Gender	.224	2.477	.014		
Popularity	.251	3.697	.000		
Power	.259	3.813	.000		
Step 4.				.341**	.063**
Intercept	-.337	-2.493	.013		
Gender	.215	2.490	.013		
Popularity	.260	3.996	.000		
Power	-.437	-3.034	.003		
Gender * Power	.471	5.417	.000		

Note. Betas are unstandardized; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

Table 9. Hierarchical Linear Regression Models Predicting Social Impact

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				.003	.003
Intercept	-.291	-1.228	.220		
Gender	.204	1.344	.180		
Step 2.				.206**	.206**
Intercept	-.125	-.590	.556		
Gender	.088	.650	.516		
Popularity	.610	8.948	.000		
Step 3.				.205**	.001
Intercept	-.127	-.597	.551		
Gender	.090	.658	.511		
Popularity	.656	6.407	.000		
Power	-.062	-.602	.548		
Step 4.				.339**	.036**
Intercept	-.134	-.642	.521		
Gender	.080	.602	.548		
Popularity	.665	6.642	.000		
Power	-.821	-3.706	.000		
Gender * Power	.514	3.842	.000		

Note. Betas are unstandardized; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

Table 10. Hierarchical Linear Regression Models Predicting Gender Typicality

	B	*t*	*p*	*Adj. R^2*	*ΔR^2*
Step 1.				-.001	-.001
Intercept	-.130	-.727	.468		
Gender	.089	.775	.439		
Step 2.				.503**	.505**
Intercept	.065	.519	.604		
Gender	-.047	-.588	.557		
Popularity	.717	17.723	.000		
Step 3.				.509**	.007˚
Intercept	.069	.547	.585		
Gender	-.050	-.620	.536		
Popularity	.622	10.307	.000		
Power	.127	2.111	.036		
Step 4.				.511**	.004
Intercept	.067	.535	.593		
Gender	-.052	-.650	.516		
Popularity	.625	10.369	.000		
Power	-.062	-.463	.644		
Gender * Power	.128	1.589	.113		

Note. Betas are unstandardized; ˚$p < .05$; *$p < .01$; **$p < .001$. **Bold** indicates new items added at each step.

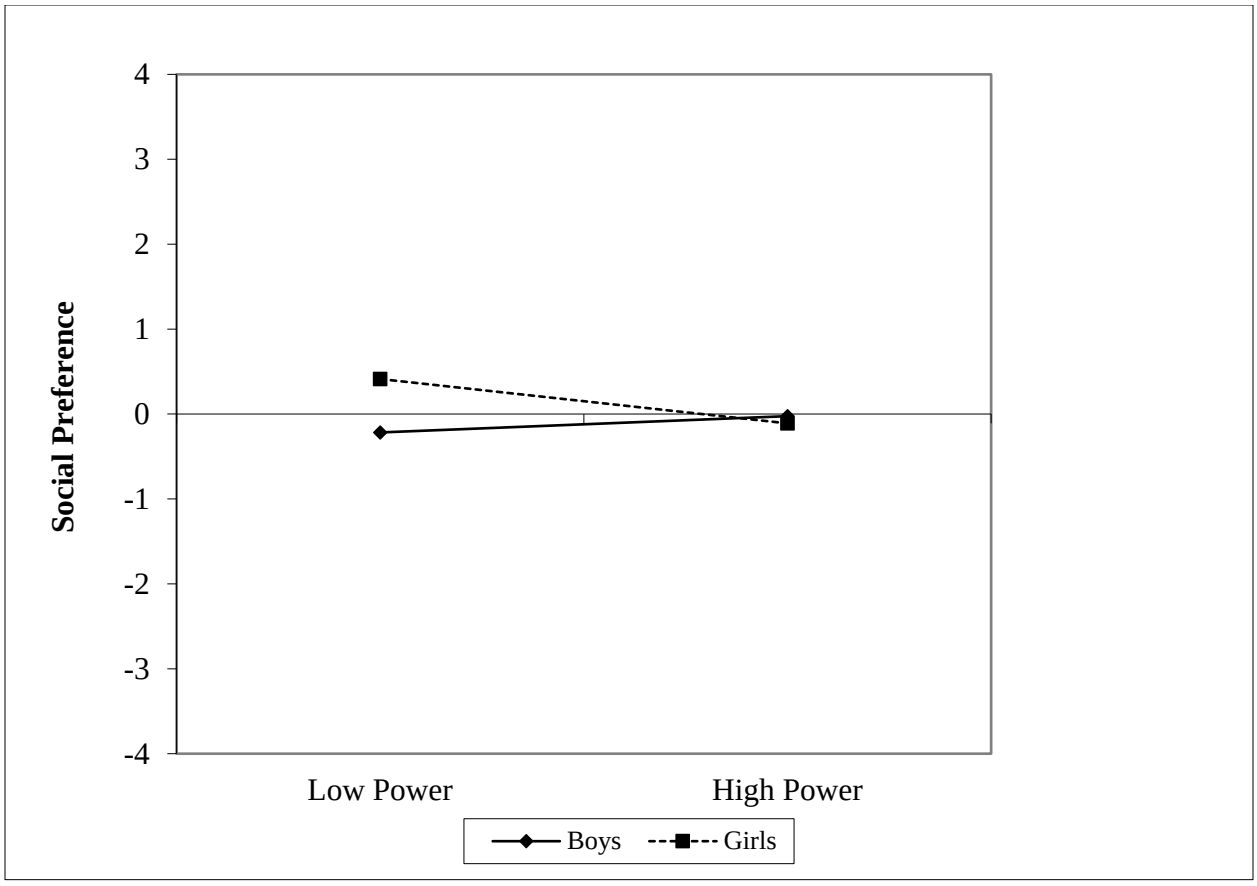

Figure 1. Gender moderates the association between power and social preference.

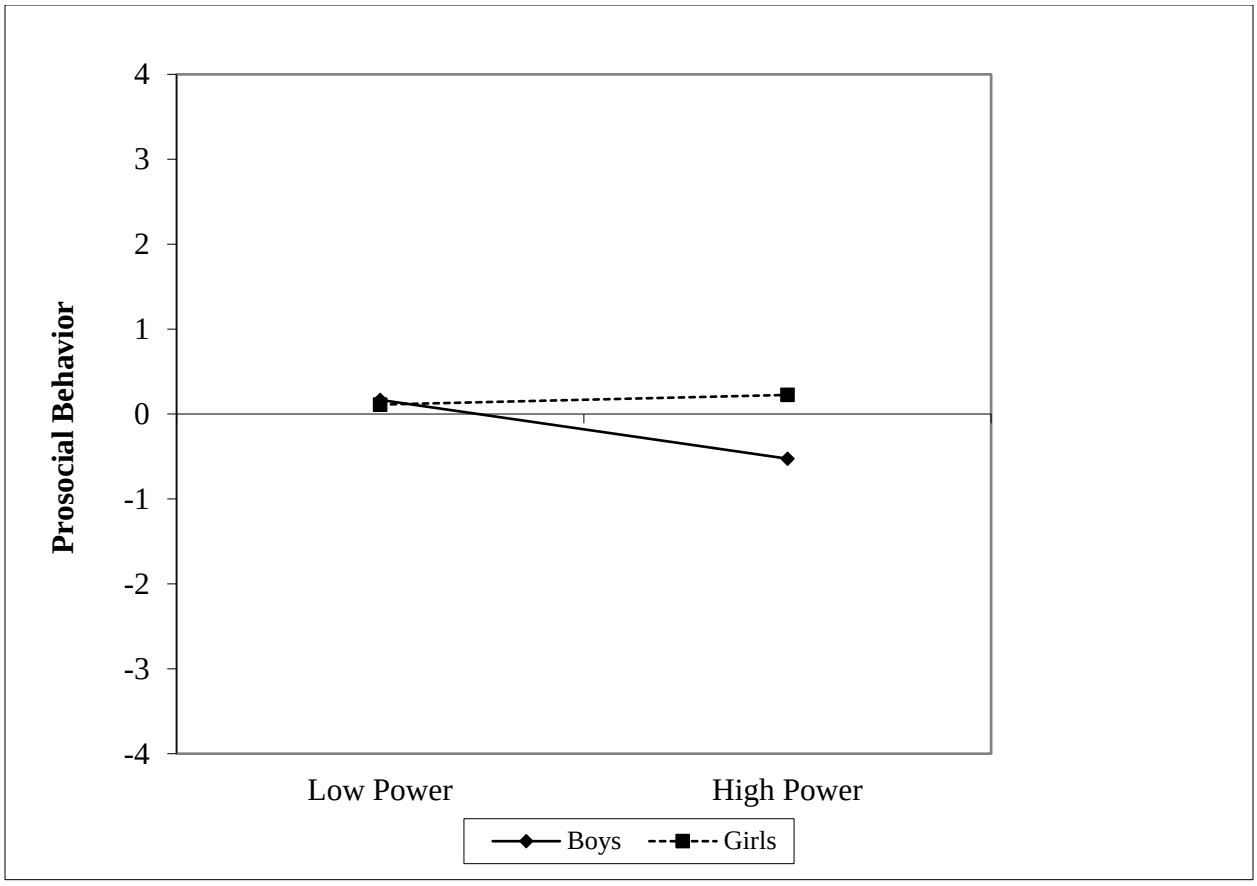

Figure 2. Gender moderates the association between power and prosocial behavior.

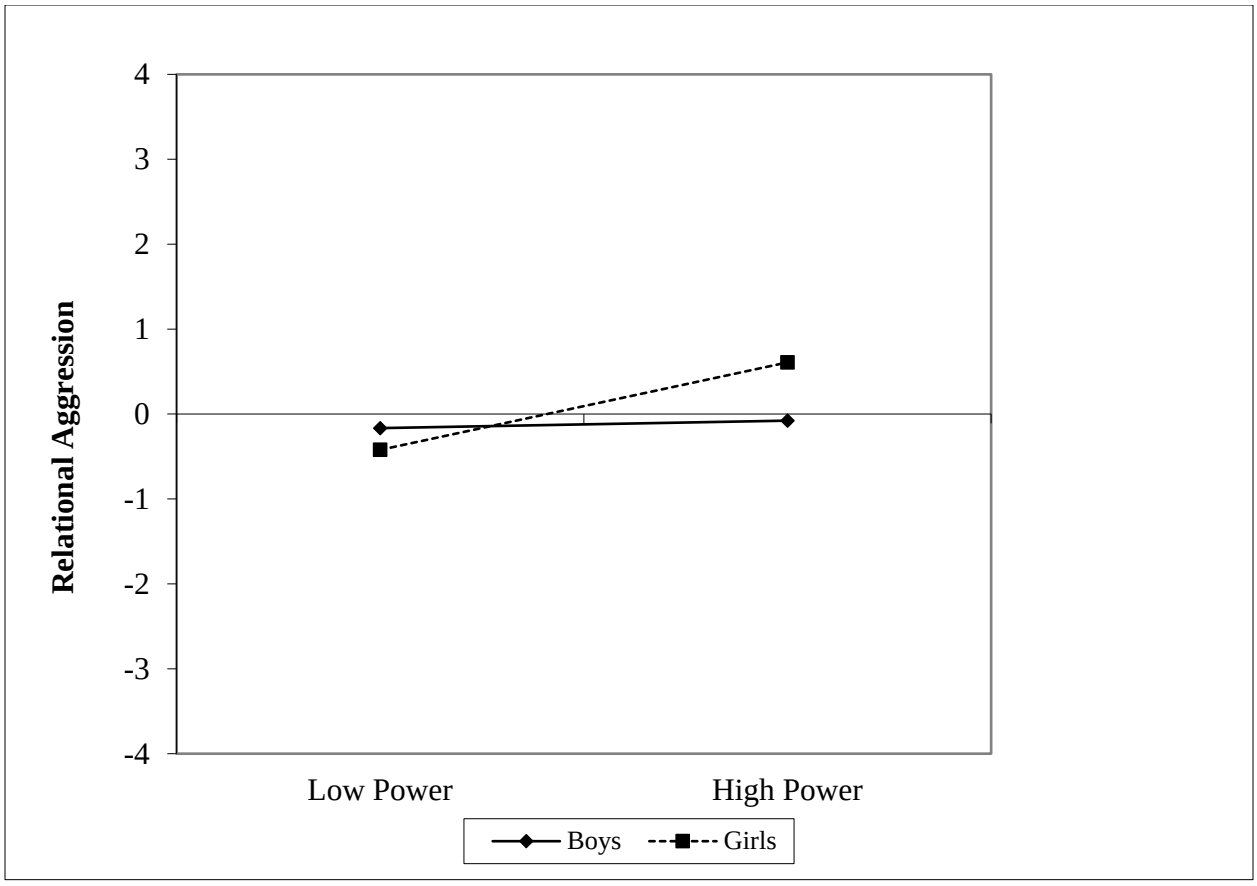

Figure 3. Gender moderates the association between power and relational aggression.

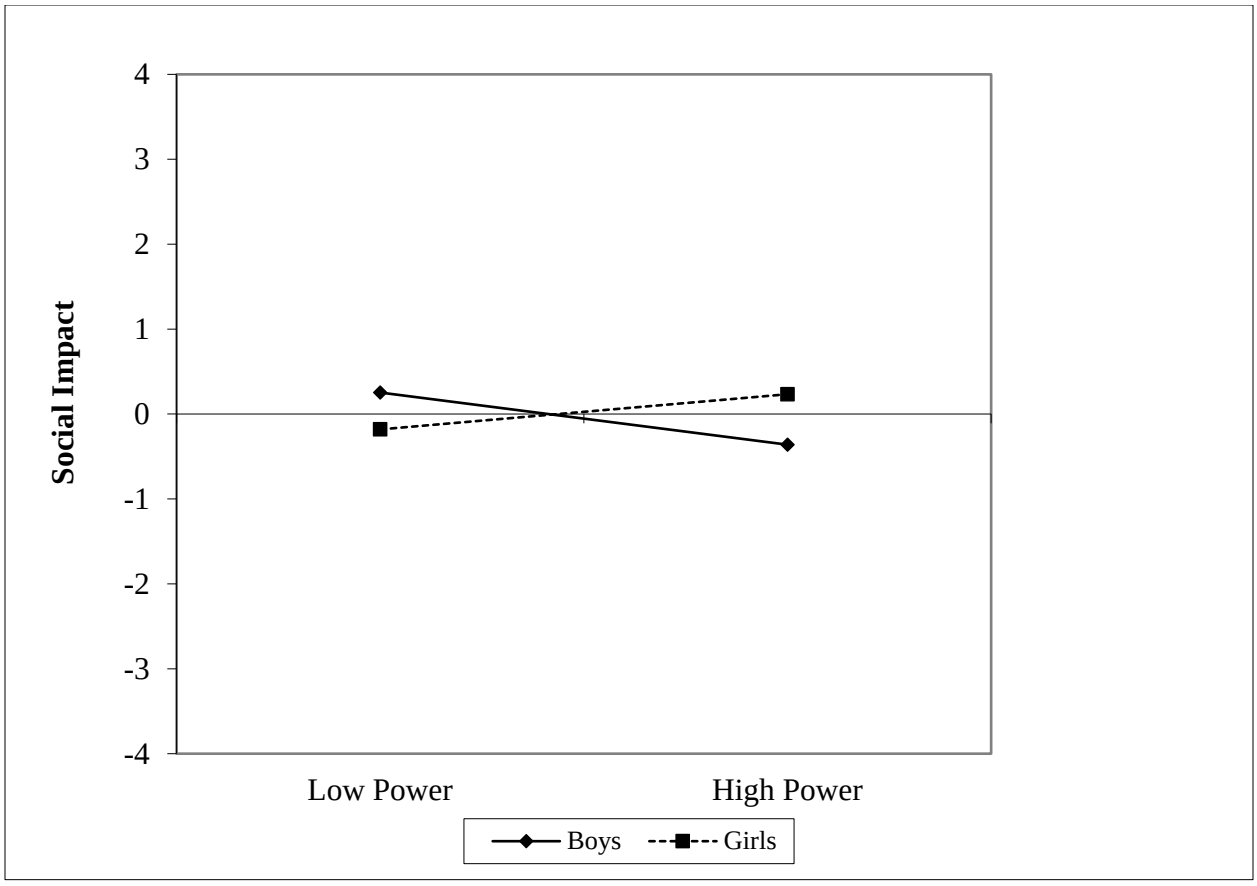

Figure 4. Gender moderates the association between power and social impact.