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Power grabbed or granted: Children’s allocation of resources in social power situations

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Abstract

Social power is usually obtained by either the dominance-based strategy (the power is grabbed by the powerholder) or the prestige-based strategy (the power is granted by group members). Although research has investigated children’s attitude toward power in the dominance-based situation, little is known about how they understand and distinguish different ways of obtaining power when interacting with others. Study 1 examined how children aged from 4 to 8 years (N = 123) allocate resources between the powerholder and the subordinate in two social power acquisition situations. The results showed children gradually shifted from distributing more to the powerholder to showing no preference towards either party (in the prestige-based situation) or distributing more to the subordinates (in the dominant-based situation) with age. Children aged 6-8, but not 4-5, were more likely to favor the powerholders in the prestige-based situation than in the dominance-based situation. Study 2 further examined whether older children’s preference towards the subordinate found in Study 1 is associated with their rectifying behavior. When power does not produce unfair results, children aged 7-8 (N = 48) favored the powerholders in the prestige-based situation, but showed no preference in the dominant-based situation. The combined results of the two studies suggest that children's attitudes towards the two ways of acquiring power start to differentiate as they enter primary school, thus influencing how they allocate resources. In addition, since only 7-8-year-olds compensate subordinates in dominance-based situations and the compensating
disappeared when power does not produce unfair results, it is likely that older children’s allocating behaviors are influenced by the development of equity concern and rectifying behavior.

Keywords: social power, dominance, prestige, resource allocation, children
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Introduction

Social power is defined as the asymmetric control of valuable resources (e.g., money, status objects, attractiveness, knowledge) by individuals in social interactions (Fiske & Berdahl, 2007; Keltner, Gruenfeld, & Anderson, 2003). Social power differences are ubiquitous in adult society, affecting people’s behavior, cognition, and emotional expressions (Guinote, 2017; Keltner et al., 2003). Social power hierarchies are also prevalent among children and affect their social cognition and social behavior (Cillessen & Rose, 2005; Hawley, 1999; Spilt, Hughes, Wu, & Kwok, 2012). For example, preschool children are more likely to copy (even irrelevant) behaviors from models with high social power, such as status, prestige or dominance (Wood, Kendal, & Flynn, 2013). Four- and 5-year-old children also prefer and favor advantaged and socially powerful individuals when allocating resources, thereby maintaining resource inequalities (Li, Spitzer, & Olson, 2014). There are many ways to obtain social power. Social power can be transferred by others, such as other high-status/power individuals or groups, or acquired by resources, such as wealth. The focus of this study is on two common ways of acquiring power that was influenced by individual factors, namely competence or dominance.
Two contrasting views have emerged on how social power is acquired individually. The conflict view suggests that social hierarchies arise from conflicts between individuals with competing interests and varying resources, and coercion and dominance play fundamental roles in establishing a system of rank allocation (Buss & Duntely, 2006; Mazur, 1985). The competence view states that individuals’ rank in a hierarchy is a function of a group’s collective agreements on individuals’ social competence or (superior) expertise (Berger, Cohen, & Zeldich, 1972). Correspondingly, dominance and prestige are likely two common approaches for people to acquire social power (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Maner, 2017). In the dominance approach, which corresponds to the conflict view, people use violence, coercion, threat, and control of reward and punishment to arouse fear and to achieve the purpose of controlling resources. Thus, the dominance approach is generally manifested as active and coercive aggression. In contrast, in the prestige approach, which corresponds to the competence view, the powerholders gain respect, admiration, and liking from others by sharing experience and knowledge, and the power accrued is based on a publicly recognized competence (Cheng et al., 2013; Hirschfeld, 2001; Maner, 2017). In terms of how power is acquired, then, in the dominance approach power is actively grabbed while in the prestige approach power is (passively) granted by group members (De Waal-Andrews, Gregg, & Lammers, 2015). Evidence shows that 21-month-old infants can distinguish between respect-based and fear-based social power (Margoni, Baillargeon, & Surian, 2018), which is conceptually similar to the prestige and dominance power described above. Five-year-
olds in both the UK and China are able to distinguish dominance and prestige (Kajanus, Afshordi, & Warneken, 2020). However, little is known about whether children’s attitudes are different towards these ways of acquiring power. The current research aims to examine this question by investigating how 4- to 8-year-old children allocate resources to and select social partners in dominance and prestige power situations.

Studies have shown that children as young as 3 years old can understand that individuals who hold more valuable resources have higher power than those who do not (Charafeddine et al., 2015; Gülgöz & Gelman, 2017). When children themselves allocate resources in social power situations, they can follow either the hierarchy structure (allocating more resources to the powerholder than the subordinate) or the fairness principle. Indeed, research has shown that in the first year of life, infants expect the dominant but not the subordinate to attain resources (Enright, Gweon, & Sommerville, 2017; Pun et al., 2017). If children follow an equity-based allocation when allocating resources in social power situations, they are motivated to pursue fairness (Shaw, Choshen-Hillel, & Caruso, 2016), either by rectifying inequalities or by allocating resources according to deservedness, such as the recipients’ needs (Rizzo, Elenbaas, Cooley, & Killen, 2016), moral deservedness (Malti et al., 2015), or previous contributions (Schmidt, Svetlova, Johe, & Tomasello, 2016). Since social power situations by definition involve asymmetric control of valuable resources, if
children follow the principle of minimizing inequality, they would allocate more resources to the subordinates to compensate for their disadvantage.

Children’s attitudes towards powerholders, as reflected in their resource allocations to dominant and subordinate individuals, appear to change with age. Charafeddine et al. (2016) found that when social power was based on social dominance (powerholders claim that they are the boss), children aged 3-4 years subsequently allocated more resources to the dominant, 5- to 6-year-old children did not show a preference for either party, and 8-year-old children allocated more resources to the subordinate. Indeed, children begin to consistently rectify existing unequal resource distributions at about 5 years old. For example, five-year-old children allocate more resources to the poor (Paulus, 2014) or disadvantaged recipients (Li, Spitzer, & Olson, 2014; Rizzo & Killen, 2016). These results show that children’s resource allocation in dominance power situations shifts from favoring the powerholder during the preschool years to compensating the subordinate in early primary school years. However, to the best of our knowledge, no research has explored how children allocate resources in a prestige power situation or compared children’s attitudes towards different ways of acquiring power. The first aim of the current research was to address this lacuna. We expected children’s attitudes in both power situations to shift from following the hierarchy structure (i.e., favoring the powerholder) to following the principle of equality with no bias in allocating behavior between the powerholder and the subordinate.
Another main aim of this study was to explore how children’s attitudes toward different ways of acquiring power develop with age. Although no study has directly explored this question before, research in related fields, such as children’s resource control, can provide useful insights. According to Hawley (1999), children control resources with two different strategies, and the adopted strategies could affect peer relations and social evaluations differently across ages. Initially, children younger than 3 years old usually control resources with coercive strategies, and these coercive children receive more attention from peers and are perceived as intimidating and attractive (La Freniere & Chariesworth, 1983). Around the age of 4, with the gradual emergence of prosocial behavior and the development of social cognition, children begin to acquire resources through both coercive and prosocial strategies: They may directly grab what they like from their peers (coercive) or obtain what they want by providing help to their peers (prosocial; Hawley, 2014). At this age, both coercive and prosocial preschoolers receive attention from their peers (Hawley, 2003; Hawley, Johnson, Mize, & McNamara, 2007; Vaughn & Martino, 1988). By the early primary school years, children's social attitudes change to preferring peers who use prosocial rather than coercive strategies. Prosocial peers are considered influential, agreeable, and are recognized as leaders, while coercive peers are rejected and recognized as bullies (Dodge, Coie, Pettit, & Price, 1990; Pettit, Bakshi, Dodge, & Coie, 1990). A recent study has shown that 4- to 5-year-olds trust the leaders or prosocial agents (i.e., prestigious powerholder) more than the bullies or antisocial agents (i.e., dominating powerholder), and this difference in preferences becomes more established with age.
These results suggest a potential parallel development in children’s attitudes towards power acquired by dominance and power acquired by prestige. Younger children might prefer power acquired by dominance while primary-school children increasingly prefer power acquired by prestige. We will investigate this question in the context of preschool and elementary-school children’s allocation of resources in different power situations and their friendship and leadership preferences.

**The current research**

The present research extends previous studies on children’s resource allocation towards high- and low-power recipients in dominance power situations by investigating age differences in children’s resource allocation in both dominance and prestige power situations. Specifically, we examined the effect of ways of acquiring power and rectifying behavior on 4- to 8-year-old children’s allocation behavior. Charafeddine and colleagues (2019) recently found an early emerging cross-cultural difference in the valuing of dominance, with preschoolers from an Asian culture (i.e., Japan) valuing dominance less and being more likely to trust a subordinate than a dominant individual compared to their counterparts from Western culture (i.e., French). Therefore, it cannot be taken for granted that patterns typically observed in Western cultures will hold in other cultures (including China). We examined children’s resource allocating in social power contexts with a Chinese sample to test
whether the allocation pattern found in Charafeddine et al. (2016) would also be similar in another Asian sample.

In Study 1, the powerholder either claimed to be the boss (dominating power) or was elected by group members (prestigious power). We observed how children allocated 5 fruit erasers between the powerholder and a subordinate in both power situations. In addition to measuring allocations to the powerholders, we directly assessed children's attitudes towards different powerholders more directly by observing children's friendship preferences (who he/she wants to be friends with) and leader preferences (based on the concern of the group: who he/she wants to elect for a leader) regarding the dominant powerholder (acting in the dominance context) and prestigious powerholder (acting in the prestige context). Examining friendship and leader preferences directly can help us understand the emerging differentiation of allocation pattern the two power situations. Children may initially allocate resources differently in the two power situations when they begin to choose the prestigious powerholder over the dominant powerholder to be their friend or the leader of group.

We choose 4- to 8-year-old children because prior studies showed that during this period children’s allocating strategies shift from a hierarchical to an equity-based allocation in the dominance-power situation (see Charafeddine et al., 2016), and their attitudes toward resource control changes from favoring coercion to favoring prosocial strategies (Hawley, 1999). In addition, Charafeddine et al. (2016) found that older children tended to rectify inequality by allocating more resources to the
subordinate. Thus, we expected that allocations in dominance and prestige power situations would begin to diverge towards the end of the preschool period. Specifically, we hypothesized that preschool children would employ a hierarchy-based allocation and thus allocate more resources to the powerholder than older children in both power situations. For primary-school children, hierarchy-oriented and equity-oriented motivations might interact with how social power was acquired. We predicted that in the dominance situation, primary school children would show an equity-based allocation and thus compensate the subordinate to rectify inequality because they no longer regard dominance as a legitimate strategy to attain power. However, because primary-school children regard prestige as a legitimate way to acquire social power, in prestige situations they might allocate more resources to the powerholder than the subordinate.

In Study 1, social power, based on dominance or prestige, created resource inequality between the powerholder and the subordinate that could potentially be maintained or rectified. Study 2 tested how children allocate resources when there is no need to rectify inequality. We hypothesized that when resources are equally distributed between the powerholder and subordinate, 7- to 8-year-old children might favor the powerholder in the prestige situation and show no preference in the dominance situation.

Study 1
In Study 1, we manipulated whether power was grabbed (dominating power: the powerholder claimed to be the boss) or granted (prestige power: the powerholder was elected by group members) to explore how children allocate resources between the powerholder and the subordinate. We also assessed children’s attitudes toward the dominant and the prestigious powerholder. Notably, proclaiming ‘I am the boss’ should be a valid way of showing dominance, as demonstrated by Charafeddine et al. (2016). In this study, we further added flexing muscles to strengthen the manipulation of dominance. Prestige power can be granted by a person’s social competence or superior expertise (Cheng et al., 2013). Thus, in the prestige vignette, the powerholder gained power because he won a drawing contest.

Method

Participants

One hundred and thirty-one children participated in this experiment. The children were recruited from middle-income families in Beijing, China. Written parental consent was obtained from all children. Eight children were excluded from the final analysis due to either experimenter error (N = 4) or incorrectly answering the quiz questions (N = 4). The final sample (N = 123) included twenty-four 4-year-olds (12 boys, 12 girls; M = 4.31, range = 3.83-4.83), twenty-eight 5-year-olds (14 boys, 14 girls; M = 5.62, range = 5.08-5.92), twenty-three 6-year-olds (11 boys, 12 girls; M = 6.37, range = 6.00-6.67), twenty-four 7-year-olds (14 boys, 10 girls; M = 7.41, range = 7.08-7.92), and twenty-four 8-year-olds (13 boys, 11 girls; M = 8.58, range = 8-9).
Though demographic data were not specifically collected, the information from these children’s teacher showed they mostly came from a middle-class background in Beijing. The 4- to 6-year-olds were tested in a quiet room in a public kindergarten and the 7- to 8-year-olds were tested in a quiet classroom in their public primary school. After completing the experiment, all participants were rewarded with stickers.

**Procedure**

Each child was presented with two stories in counterbalanced order across trials. One story described a *dominance power situation*, the other a *prestige power situation*. After hearing the first story, participants were asked to allocate resources between the two characters in the story. Then they were presented with the second story and were again asked to distribute resources to the story characters. Finally, we also observed children's friendship preference (who he/she wants to be friends with) and leader preference (who he/she wants to elect for a leader) between the dominant powerholder and the prestigious powerholder. (Figure 1).

**Manipulation phase**

Participants were seated next to the experimenter and were presented with a series of pictures in PowerPoint 2016 on a laptop screen. One series showed a story about a *dominance power situation*, and the other a story about a *prestige power situation* adapted from Charafeddine et al. (2016). The experimenter described the stories as s/he walked the children through the slides. Figure 1 presents an example of the experimental procedure.
In the power phase, three boys of the same age, dressed in different colors (either dressed in red, blue, and purple or green, orange, and yellow), were introduced to the participant. In the dominance situation, the high-power party, or the “boss”, has more muscles than the other two boys; in the prestige situation, the three boys had the same physical appearance. In both situations, the boss is always located in either the right or the left position. The color group of the characters’ clothes and the position of the boss was counterbalanced across participants and balanced across trials.

In each story, the three boys were each asked to pick out their favorite toy for the group to play with. After all three boys picked a toy, the teacher said that the group could only play with one toy since there were not enough toys for all children. The group was then faced with the question of who was to decide which toy to play with. In the dominance power situation, the muscular boy showed his biceps that look significantly bigger than those of others in the presentations. He claimed that he was the boss because he was stronger, and everyone should play with the toy he picked. The other two boys obeyed his proposal. In the prestige power situation, the boys decided to first elect a boss, and then the elected boss could dictate which toy to play with. The boys each had a star, and they could give the star to the group member whom they wanted to be the boss. Two boys then gave their stars to the third boy, claiming that they voted for him because he won the first prize in that day’s drawing competition. The third boy thus became the boss of the group, and a crown was placed on his head to signify his position. The boss then decided which toy the group
should play with. In both situations, the boss dictated that everyone should play
together with the toy he picked out and then played with the toy for the afternoon. At
the end of each story, the boy in the middle position (not the boss) went home first
and the other two boys stayed. The power hierarchy was then established between the
remaining two boys: the boss was the powerholder, and the other boy was the
subordinate. At the end of this phase, children were asked two memory/quiz questions
in counterbalanced order: (1) who out of these two boys played with the toy of his
choice? (2) Who out of these two boys did not play with the toy of his choice? If the
child failed to provide the correct answers, the experimenter repeated the story and
asked the memory questions again. Three children did not answer correctly the first
time, but they all correctly answered the questions after the experimenter repeated the
story, and were thus included in the final sample. Four children did not answer
correctly even after the story was repeated three times and were excluded from the
final sample.

Test phase

The experimenter presented five fruit erasers to the participant and asked him/her
to distribute them between the two boys remaining at the end of the story (i.e., the
powerholder and the subordinate). During this phase, the laptop screen displayed the
images of the powerholder and the subordinate, and two actual paper cutouts of the
characters were also placed in the front of the child. Two boxes with open lids were
placed in front of the two characters, and five fruit erasers were placed between the
two boxes. Participants were asked to put the erasers that they wanted to give to each character into the box in front of that character. They were told that they had to distribute all five erasers. We chose an odd rather than an even number of erasers because we wanted to get a clearer picture of children's allocation preferences and prevent them from distributing equally. After children allocated the erasers, the experimenter asked several questions to ensure that participants understood the meaning of power and how the powerholder obtained his power. Question 1: “In the kindergarten (school), who is the boss?” (only presented in the first power context); Question 2, “In the story, who is the boss or who is not the boss?”; Question 3, “In the story, did the boss claim that he was the boss, or did others elect him to be the boss?”

All of the children answered Question 1 correctly with “teacher” or “principal”. Children largely provided the correct answer to Question 2 (only 2 children answered incorrectly) and Question 3 (71% of the 4-year-olds, 86% of the 5-year-olds, 87% of the 6-year-olds, 88% of the 7-year-olds, and 84% of the 8-year-olds gave the correct answer in both power situations, the remaining children gave the wrong answer in one of two power situations, and no one gave wrong answers in both power contexts).

After participants finished allocating resources to the characters in both stories, the experimenter asked the child to recall the two stories in sequence and to point out the boss in each story. If the child could not recall the important details (e.g., who is the boss, how did the boss acquire his power; n = 15), the experimenter told the story again until all children correctly recalled it. Afterward, the experimenter presented the
images of the two bosses on the screen and asked the child the friendship preference question (“who do you want to be good friends with between these two bosses?”) and the leader preference question (“if you can play with those two bosses, who do you want to choose to be the leader of the three of you?”) to examine the child’s attitudes towards the bosses in the dominance and prestige situation. The order of these two questions was counterbalanced.

Results

Children’s resources allocation

Preliminary analyses showed that there was no effect of gender ($\chi^2 < 0.03$, $p_s > .95$) or order ($\chi^2 < 3.06$, $p_s > .08$) on allocations in either power situation. Thus, gender and order were not included in the subsequent analyses of resource allocation.

Almost all children ($N = 117, 95.1\%$) either allocated 2 erasers to the powerholder and 3 to the subordinate ($N = 65$ in dominance situation, $N = 38$ in prestige situation) or allocated 3 erasers to the powerholder and 2 to subordinate ($N = 52$ in dominance situation, $N = 79$ in prestige situation). Considering the non-normality of the data’s distribution (Kolmogorov-Smirnov test, $p < .001$ in both situations), the allocation variable was recorded as a binary variable: children who gave more erasers to the powerholder (3 vs. 2, 4 vs. 1, or 5 vs. 0) were coded as 1, and children who gave more erasers to the subordinate (0 vs. 5, 1 vs. 4, or 2 vs. 3) were coded as 0.
We performed a generalized linear mixed model, with a binomial probability distribution and a logit link function, on allocations (0 = favor the subordinate, 1 = favor the powerholder) with age and power context as fixed effects and ID as a random intercept with package lme4 in R statistical software (R core team; Bates et al., 2015). We found significant effects of age ($\beta = 0.67$, $z = 3.95$, $p < .001$) and context ($\beta = -1.19$, $z = -3.35$, $p < .001$). Children were more likely to favor the powerholder in the prestige situation than that in the dominance situation, and older children were more likely to favor the subordinate than younger children.

We also performed more fine-grained analyses to examine allocation behavior in each age (see Table 1). Two-tailed binomial tests were used to examine whether the percentage of participants who allocated more resources to the powerholder differed from the chance level of 50%. The Wilcoxon test was used to analyze whether there was a significant difference in children’s allocation patterns between the two power situations in each age. Figure 2 presents the developmental trajectory and the proportions of children aged 4-8 who favored the powerholder in both two situations. In the dominance situation, 4-year-olds tended to favor the powerholder (two-tailed binomial test: $p < .05$), 5- to 7-year-olds showed no favor (two-tailed binomial test: $p_s > .15$), and 8-year-olds favored the subordinate (two-tailed binomial test: $p < .01$).

In the prestige situation, 4- to 6-year-olds tended to favor the powerholder (two-tailed binomial test: 4-year-olds, $p = .06$, 5- to 6-year-olds, $p_s < .01$), while 7- to 8-year-olds had no preference (two-tailed binomial test: $p_s > .32$). Wilcoxon test showed that, for
children aged 4- or 5-year-old, the proportions of children who favored the powerholder did not show significant differences between these two power situations ($Z_s < -2, p_s > .08$), but for children aged 6- to 8-year-old, the proportion of children who favored the powerholder in the prestige situation was higher than that in the dominance situation ($Z_s > -1.73, p_s < .05$).

**Preference for dominating and prestigious powerholder**

Regarding children’s friendship preference (*who do you want to be good friends with between those two bosses?*) and leader preference (*if you can play with those two bosses, who do you want to choose to be the leader of the three of you?*), we coded preferring the prestigious powerholder as 1 and preferring the dominating powerholder as 0. As Table 2 shows, 4- and 5-year-old children did not show friendship preference (two-tailed binomial test, $p_s > .09$) and leader preference (two-tailed binomial test, $p_s > .06$) to either powerholder. Six- to 8-year-old children were more likely to be friends with the prestigious powerholder ($> 83\%$, two-tailed binomial test, $p_s < .01$) and more likely to elect the prestigious powerholder as the leader ($> 83\%$, two-tailed binomial test, $p_s < .01$).

We also found significant gender differences for both questions. As shown in Table 2, girls were more likely than boys to make friends with the prestigious powerholder ($\chi^2 = 9.83, p < .01$, Cramer’s $V = .28$) and vote for the prestigious powerholder as the leader ($\chi^2 = 4.66, p < .05$, Cramer’s $V = .20$). Two-tailed Fisher’s exact test revealed the interaction effects of age and gender on children’s preference.
For children aged 4, 7, and 8, there were no significant differences in the proportion of boys and girls who preferred to be friends with the prestigious powerholder ($p_s > .40$) and who preferred the prestigious powerholder as a leader ($p_s > .16$). But for children aged 5 and 6, girls were more likely than boys to make friends with the prestigious powerholder ($p_s < .05$) and to elect the prestigious powerholder as the leader ($p_s < .05$).

**Discussion**

The results of Study 1 revealed that 4- to 8-year-old children showed a clear tendency to shift from hierarchy-orientated to fairness-orientated resource allocations in both dominance and prestige situations, but the trajectory was different in these two contexts. Four-year-old children showed a tendency to favor the powerholder in both situations, 5- 6-year-olds tended to favor the powerholder in the prestige situation but showed no favor in the dominance situation, and 8-year-olds favored the subordinate in the dominance situation but had no preference in the prestige situation. Additionally, 6-8-year-olds were more likely to make friends with and to elect the prestigious over dominating powerholders. Taken together, with age children favor prestigious power in their resource allocations, and this preference towards prestigious power significantly exceeds that towards dominating power by 6 years of age.

The difference in resource allocations between the two power situations after the age of 6 years indicates that the way of acquiring power influences the resource
allocation of children in power situations. Eight-year-olds showed a tendency to favor the subordinate in the dominance situation but not in the prestige situation. One possible explanation is that resource allocation in older children is both influenced by rectifying behavior (Li, Spitzer, & Olson, 2014; Rizzo & Killen, 2016; Elenbaas, Rizzo, Cooley, & Killen, 2016) and deservedness concerns (Malti et al., 2015; Rizzo et al., 2016; Schmidt et al., 2016). In dominance situations, eight-year-olds might hold a negative attitude to the coercive resource holder and want to rectify the inequality by compensating the subordinate. In contrast, in the prestige situation, the powerholder was granted his power by the group. Eight-year-olds might believe that the powerholder deserves both the power and additional resources and thus do not feel the need to compensate the subordinate. Overall, these results confirm previous findings that older children and adolescents are more likely to take (moral) deservedness consideration into account when allocating resources to peers (e.g., Malti et al., 2015).

There were also significant age and gender effects concerning preferences for the dominating and prestigious powerholder. Six- to eight-year-olds, but not 4 to 5-year-olds, preferred the prestigious powerholder. This is consistent with the results in previous resource allocating tasks indicating that by 6 years children began to show different allocating pattern between the dominance and prestige power situations, and is also line with resource control theory (Hawley, 1999), which showed that with increasing age nearly 5-6-year-olds prefer peers who engage in prosocial rather than
coercive resource control strategies. Concerning the gender effect, 5-6-years old girls are more likely to prefer the prestigious powerholder than boys of the same age. One possible explanation is that boys are more likely to solve problems or obtain resources through coercive violence in preschool, while girls are more likely to advocate solving problems with peaceful and prosocial strategies (Dodge, Coie, Pettit, & Price, 1990; Pettit, Bakshi, Dodge, & Coie, 1990).

**Study 2**

Study 1 shows that 6 to 8 years of age is a period of change for children’s resource allocation in social power situations, but there remains the question as to what underlies these changes. The foremost candidate may be the motivation to rectify the inequalities caused by social power. However, 6- to 8-year-old children’s allocation strategies might also be influenced by deservedness concerns, which means children no longer see the prestigious power position as worthy of more resources. The design and findings of Study 1 make it difficult to tease apart these two considerations (rectifying inequalities vs. deservedness concerns). Thus, Study 2 aimed to examine whether the rapid decrease of the proportion of resources allocated to the prestigious powerholder from age 6 to age 8 was determined by older children’s rectifying concern. Study 2 investigated 7- to 8-year-old children’s resource allocations when power did not produce resource inequality in order to control for the effect of rectifying concern. If older children allocate more resources to the powerholder in Study 2 than in Study 1, it is then likely that older children’s resources
allocation in power situation is also influenced by their fairness concern, which means to rectify inequality. We chose to study 7- to 8-year-olds because Study 1 found that only children from age 6 to age 7 started to allocate fewer resources to the powerholder, which is likely to be the result of rectifying concern. We expected that in situations where there is no need to rectify inequality, 7- to 8-year-old children would distribute more resources to the powerholder in the prestige situation and show no preference in the dominance situation.

Method

Participants

Participants were 24 seven-year-old (14 boys; 10 girls; $M_{age} = 7.72$, range = 7-8) and 24 eight-year-old children (12 boys, 12 girls; $M_{age} = 8.51$, range = 8.08-9) recruited from an elementary school in Beijing, the People's Republic of China. Two additional children were excluded due to experimental error. According to the teachers, the participants mostly came from middle-class families in Beijing. Written parental consent was obtained for all children. After completing the experiment, all participants were rewarded with stickers.

Material and procedure

The materials and procedures used in Study 2 were similar to those in Study 1, except that the characters in both power situations did not play with any toy after the power hierarchy was established. In both stories, the boss dictated that they should
play together with the toy he picked out, but just as the boss picked out the toy to play with, the teacher said it was time to eat fruit and collected all toys. Thus, the three characters in the story did not play with any toy, and there was equality in resource control between the powerholder and the subordinates, unlike in Study 1 where one character played with his favorite toy.

The subsequent procedure was the same as in Study 1. The character in the middle left, leaving two characters, the powerholder and one of the subordinates. Children were asked to distribute 5 fruit erasers to the two characters after answering the same quiz questions as in Study 1. Six children answered the quiz questions correctly for the second time after the story was repeated to them, while the remaining answered correctly the first time. Subsequently, like Study 1, the child was asked to recall the two stories in sequence and to point out the boss in each story. All children could recall the important details (e.g., who is the boss, how did the boss acquire his power). Afterwards, unlike in Study 1 where children had to allocate resources between the boss and the subordinate in each power contexts, here the experimenter presented the images of the two bosses on the screen and asked children to allocate 5 erasers between the dominating boss and prestigious boss, followed by the friendship preference and the leader preference questions, which were counterbalanced across children. Finally, several questions similar to Study 1 were asked to ensure that participants understood the meaning of power and how the powerholder obtained his power. All of the children answered Question 1 [in the kindergarten (school), who is
the boss?” (only presented in the first power context)] correctly with “teacher” or “principal”. Children largely provided the correct answer to Question 2 (“who is the boss or who is not the boss”, only 1 child answered incorrectly) and Question 3 (“did the boss claim that he was the boss, or did others elect him to be the boss?” only 2 children answered incorrectly).

Results

Children’s resource allocations

Preliminary analyses showed no effect of gender ($\chi^2 < 0.48, p > .10$) on allocations in either power situation, but an effect of context order was found. Children were more likely to favor the subordinate when the dominance context was presented first than when the prestige context was presented first in the prestige context ($\chi^2 = 5.21, p = .02$). One possible explanation might be that when the dominance context was presented first, children’s fairness concerns were activated, causing them to compensate for the subordinate’s disadvantage. Thus, context order was included in the subsequent analyses on resource allocation.

Similar to Study 1, almost all children (45/48 in the dominance context, 48/48 in the prestige context) allocated either 2 erasers or 3 erasers to the powerholder, and 39/48 children allocated either 2 erasers or 3 erasers when they were asked to allocate resources between the prestigious and dominating powerholder. Since the data’s distributions were not normal (Kolmogorov-Smirnov test, $p < .001$ in both situations), we coded the distributing behaviors as a binary variable. Specifically,
children who gave more erasers to the powerholder in two power situations and to the prestigious powerholder in powerholders contrast context (3 vs. 2, 4 vs. 1, or 5 vs. 0) were coded as 1, and children who gave more erasers to the subordinate in two power situations and to the dominated powerholder in powerholders contrast context (0 vs. 5, 1 vs. 4, or 2 vs. 3) were coded as 0.

We performed a GLMM analysis on allocations with power context and order as fixed effects and ID as a random intercept. We found significant effects of power context ($\beta = -1.35$, $z = -2.92$, $p < .01$) and order ($\beta = -1.31$, $z = -2.85$, $p < .01$). Children were more likely to favor the powerholder in the prestige situation than in the dominance situation. Table 3 presents the proportion of participants who favored the powerholder in each power situation. Even when these analyses were conducted separately for the two age groups, 8-year-olds did not show significant allocation favor in the prestige situation ($p = .15$). Taken together, 7- to 8-year-olds showed no difference in favoring either one of the two recipients in the dominance situation and favored the powerholder in the prestige situation.

Children were also asked to allocate resources between the dominating and prestigious powerholders, and the results showed that 7 to 8-year-olds were more likely to allocate resources to the prestigious than the dominating powerholder (see Table 4).

Preference for dominating and prestigious powerholders
Table 4 presents participants’ friendship and leader preferences for the dominating and prestigious powerholders. Children were more likely to befriend and vote for the prestigious powerholder. There was no effect of gender \( \chi^2 (1) < 2.72, p_s > .10 \).

**Comparison with Study 1**

We compared resources allocation and preferences for the 7- and 8-year-olds in Study 1 and Study 2. A GLMM on resources allocation was conducted with power context and study as fixed effects and ID as a random effect. We found significant effects of context (\( \beta = -1.56, z = -3.49, p < .001 \)) and study (\( \beta = -1.31, z = -2.37, p = .017 \)). Seven- and 8-year-olds were more likely to allocate resources to the powerholder in the prestige than in the dominance context and were more likely to allocate resources to the powerholder in Study 2 than Study 1.

An even finer-grained analysis was conducted to reveal the difference between Studies 1 and 2 in each power context. As shown in Figure 3, in the prestige context, the proportion of children favoring the powerholder in Study 2 was significantly higher than that in Study 1 \( \chi^2 (1) = 6.17, p < .05 \), but in the dominance context, there was no difference between Studies 1 and 2.

For the preference tasks, the results from both studies indicated that 7- to 8-year-olds were more likely to be friends with the prestigious powerholder and to elect the prestigious powerholder as the leader (Tables 2 and 4). Chi-square tests showed there
were no differences in the children’s choices between Study 1 and Study 2 [friendship preference, $\chi^2(1) = 0.01, p = .97$; leader preference, $\chi^2(1) = 0.23, p = .63$].

Discussion

Study 2 showed that when power did not produce outcome inequality, 7- and 8-year-old children allocated more to the powerholder in the prestige situation and showed no preference in the dominance situation. This is different from Study 1, where older children favored the powerholder in the prestige situation but favored the subordinate in the dominance situation. The results from both studies suggest that the preference toward the subordinate in Study 1 was driven by a desire to rectify an inequality caused by coercive power. Just as in Study 1, 7- and 8-year-olds preferred to make friends with and choose the prestigious powerholder as the leader.

General Discussion

This research examined 4- to 8-year-old children’s resource allocations and attitudes towards social power acquisition in two contexts and across two studies. Results showed that with increasing age the resource allocation of children gradually changed: Preschool children favored the powerholder in both dominance and prestige power situations while 7- to 8-year-old children favored the subordinate in the dominance context or showed no preference in the prestige context. These differences in resources allocation strategies in the two power situations became differentiated around the age of 6. Similarly, children were more likely to be friends with and voted
for the prestigious than the dominating powerholder to be leader around the age of 6.

These results suggest that 4- to 8-year-old children show a developmental shift in allocating resources in power situations from a hierarchy to a fairness-based allocation. However, the manifestation of this shift depended on the context (i.e., whether power was based on dominance or prestige) and whether social power initially established inequality between the powerholder and the subordinate.

In general, the results of this study and those of previous studies demonstrate that children's cognition of power roughly conforms to the viewpoint of stage theory, similar to that of Kohlberg's conception of stages (Carpendale, 2000). That is, early preschoolers prefer high-power people, obeying authority regardless of whether the source of authority conforms to social norms. In the early elementary school years, with the development of children's fairness concerns, they pay more attention to social norms in social interactions, and also conduct social interactions in line with fairness norms in power situations. Additionally, this pattern, shifting from hierarchy to fairness, was also in line with Fiske’s (1992) proposal that human social relationships are based on four fundamental psychological models: communal sharing, authority ranking (similar with hierarchical ranking), equality matching, and marketing pricing. Fiske (1992) suggests that understanding of these social relationship models develops in this sequence during childhood. Thus, children develop a hierarchy orientation before an equality matching orientation.

The shift from a hierarchy to a fairness-based allocation can be accounted for by
two explanations. The first is the development of children’s attitudes towards how power is acquired. Four-year-old children appear to be hierarchy orientated (they allocate more to powerholders) regardless of how power is acquired. From around age 5, children no longer favor the powerholder in the dominance situation. This suggests that children’s attitudes toward the ways of acquiring power based on dominance and prestige gradually diverge in the early primary school years, which is in line with the development trajectories suggested by resource control theory (Hawley, 1999). In early childhood, resource control is mainly based on coercive strategies, and a lack of social experience prevents children from forming a different understanding of alternative resource control strategies. As children’s verbal communication abilities and theory of mind skills improve with age, they can use verbal negotiations, discussions, and persuasions to settle conflicts and disagreements (Peterson, Slaughter, & Wellman, 2018). Children gradually realize that they can obtain resources by helping others and exchanging their own property, although they still control resource with coercive methods (Hawley, 2003). Thus, prosocial strategies develop and increase with age. In addition, children also start to learn that prestige-based behavior, rather than dominance-based behavior, is approved by society (Rakoczy & Schmidt, 2013). This understanding of social norms in combination with social-cognitive developments makes children increasingly prefer the prestige over the coercive strategy (see Hawley, 1999 for review).
Our results of children’s allocations and attitudes in the dominance context were consistent with that of Charafeddine et al. (2016). These authors introduced a more pronounced coercive quality of self-proclaimed power, whereas in the current study, coercive power was vividly visualized (i.e., the powerholder showed off his muscle and claimed that other children should listen to him because he is stronger). In line with previous research (i.e. Charafeddine et al., 2016; Hawley, 1999, 2003), the current study showed that children’s negative attitude towards coercive strategies (i.e., dominance power) gradually grows across development from early preschool to early school age, which may partially explain the difference of allocation pattern between the older children (7-8-year-old) and younger children.

The second explanation for the shift from hierarchy-based allocation to fairness-based allocation is the development of resource rectifying behavior. Study 2 shows that children allocate more resources to the powerholder in the prestige power situation while showing no difference in allocation differences in the dominance power situation when power does not create unequal outcomes. This indicates that early school-age children prefer powerholders with power being granted by group members based on their expertise or outstanding skills rather than those who grab power with coercive or aggressive behaviors. Prestigious powerholders were regarded as deserving surplus resources, especially when there was initial equality (Study 2). This shows that fairness concerns of children in distribution tasks are dependent on how power was established. When distributing resources between the powerholder
and the subordinate, children take into consideration how power was acquired along with a number of other previously established factors, such as the recipients’ merit, need and moral deservedness in traditional distribution tasks (Malti et al., 2015; Rizzo, Elenbaas, Cooley, & Killen, 2016). Therefore, taking into account how power was acquired when evaluating fairness, 7- to 8-year-olds favor the prestigious powerholder when power does not create unequal outcomes.

The results of this research are partly in line with those of Vasilyeva and Ayala (2019) on children’s early ability to distinguish between structural and individual inequalities, where power is either established through biased social systems versus being earned via individual effort or merit. Similarly, Rizzo et al. (2020) found that 3-8-year-olds perpetuated individual inequalities (based on recipients’ merit) but either rectified or allocated resources equally in response to structural inequalities (based on recipients’ gender). As Study 1 indicates, 7-year-olds began to reject clearly unjust power dynamics in response to individual inequalities (based on recipients’ power asymmetry) by either rectifying inequality (in the dominance power situation) or allocating equally (in the prestige power situation) between the powerholder and the subordinate. Older children in the power situation did not perpetuate individual inequalities based on recipients’ power asymmetry but rectified it or allocated equally, possibly because of the added inequality of power rather than just resource inequality, and the accumulated inequality increased their possibility of correcting the resources. Relatedly, the fact that children in Study 2 did not favor the subordinate in the
dominance condition (like they did in Study 1) is interesting, as it suggests that children need to see an instantiation of social power (such as controlling resources asymmetrically) in order to challenge or rectify it. Future research should examine rectifying behavior in response to structural inequality in power situation to further investigate the relation between power and rectifying behavior.

Combining the results of Study 1 and Study 2, the present work shows that whether power produces inequality (i.e. resources control) should be considered when studying children’s attitudes towards social power. While power usually involves the asymmetric control of valued resources, our work breaks down the power processes into two steps: acquiring power and resource control. Our results suggest that children’s attitudes to powerholders are influenced by both: Children favored the powerholder who has accrued power by prestige, but they also try to rectify emerging inequalities when the prestigious powerholder initially holds more resources.

The results for the friendship and leader preference tasks support the developmental shift also found in the resources allocation task. Six-year-olds began to prefer making friends with and voting for the prestigious over the dominating powerholder (in Study 1). Moreover, there was a gender difference in preference for the prestigious versus the dominating powerholder in 5- and 6-year-old children with girls showing this preference earlier than boys (5-year-old, girls and boys: 100% vs 36%), even though no gender differences in allocating tasks in power situation emerged. This is consistent with the results by Charafeddine et al. (2016). These
findings might indicate that girls exhibit sensitivity to the way of how power is acquired earlier than boys, a finding that should be replicated in future research.

The current research was conducted in an Asian society which allowed investigating whether results found in western societies generalize to other cultures. Indeed, our results in the dominance power situation were consistent with those of Charaffeddine et al.’s (2016) French sample. However, it should be noted that recent studies have also found cultural differences in the understanding of social power by preschool and school-aged children. Specifically, compared to Western children, Asian children seem to value dominance less (Charafeddine et al., 2019; Kajanus et al., 2020). Cross-cultural studies on the allocations of children in these two power situation are needed to examine how culture shapes children’s understanding of social power in different power situations.

Despite our persuasive results, there are several limitations to this research. First, the dominance and prestige acquiring power situations in this study were manipulated and conducted in the laboratory and the data was obtained through forcing children to allocate surplus resource to one character, which may limit its ecological validity. In the real-life environment, as described in Hawley's series of studies (see review in Hawley, 2014), children's approach to resource control also includes a bi-strategy approach (using both prosocial and coercive means), which may be more successful in controlling resources than either the prosocial or coercive strategy alone. Future studies may consider assessing social power in more real-life contexts with peer
nominations in a school setting and providing multiple options for distribution, such
as including equal distribution between powerholder and subordinate. Moreover, the
protocols used in this study, which employed visual depictions of the biceps to
demonstrate the powerholder’s force, is a very male-typed way of coercion, which
limits its ecological validity and may have different effects on boys and girls.
Research has indicated that preschoolers believe males have more power than females
(Gülgöz, 2015). It would be important to explore whether this expectation is due to
children believing that men use dominance more to acquire power than women, which
may in turn affect their understanding of power within different gender groups.
Second, social desirability should be considered when studying children’s attitudes
toward different social power contexts. Even though the experimenters in the current
studies had been strictly trained not to show any bias to children, the presence of the
experimenters may have still had an effect on children with them trying to match the
perceived experimenters’ expectations. Implicit measures, anonymous and double-
blind procedures may be considered in future research. Third, it is not clear what
factors lead children to prefer prestige. Further studies could explore the mechanism
of children’s preference for the prestigious powerholder. For example, reputation is an
important factor when children choose cooperative peers (Engelmann, Over,
Herrmann, & Tomasello, 2013; Fu & Lee, 2007) and may lead children to favor
prestigious individuals. It will also be important for future studies to explore the effect
of children’s prosocial behavior expectations on resources allocation, as this factor
has been shown to influence children’s social preferences (Ahl & Dunham, 2018).
Specifically, it is possible that children think prestigious powerholders are more likely to engage in prosocial behaviors, and thus prefer to ally with them. Overall, given the ramifications of social power differences in children’s social lives and societies at large, understanding the developmental differences in children’s attitudes to and their interactions with powerholders and subordinates remains an important topic for future research.

In conclusion, this is the first study that compares children’s resources allocation to powerholders and subordinates in dominance and prestige power situations. Four-to 8-year-olds gradually shifted from distributing more to the powerholder to showing no favor towards either party or distributing more to the subordinates. Six- to 8-, but not 4- to 5-year-olds, were more likely to favor the powerholders in the prestige situation than in the dominance situation. And, when the power did not produce unfair results, 7-8-year-olds favored the powerholder in the prestige situation. We provide evidence that children’s resources allocation in power situations is influenced by the development of their attitudes towards different strategies of acquiring power and the development of rectifying behavior.
References


Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., & Henrich, J. (2013). Two ways to the top: evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of Personality and Social...
Psychology, 104(1), 103-125. doi: 10.1037/a0030398


Rizzo, M. T., & Killen, M. (2016). Children's understanding of equity in the context


Table 1

The number and proportion of children who favor the powerholder in resources allocation in two power situations in Study 1

<table>
<thead>
<tr>
<th>Age</th>
<th>Dominance</th>
<th>Prestige</th>
<th>Wilcoxon test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Binomial</td>
<td>Binomial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>test</td>
</tr>
<tr>
<td>4 years old</td>
<td>18</td>
<td>75%</td>
<td>.05</td>
</tr>
<tr>
<td>5 years old</td>
<td>16</td>
<td>57%</td>
<td>.57</td>
</tr>
<tr>
<td>6 years old</td>
<td>9</td>
<td>39%</td>
<td>.41</td>
</tr>
<tr>
<td>7 years old</td>
<td>8</td>
<td>33%</td>
<td>.15</td>
</tr>
<tr>
<td>8 years old</td>
<td>5</td>
<td>21%</td>
<td>.01</td>
</tr>
<tr>
<td>Total (N=123)</td>
<td>56</td>
<td>46%</td>
<td>.37</td>
</tr>
</tbody>
</table>
Table 2

The count and proportion of children who prefer the prestigious powerholder between the dominating and prestigious powerholder in Study 1

<table>
<thead>
<tr>
<th>Total</th>
<th>Friendship preference</th>
<th>Leader preference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Binomial test $p$</td>
</tr>
<tr>
<td></td>
<td>$N$</td>
<td>$N$ (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years old</td>
<td>24</td>
<td>15 (63%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years old</td>
<td>28</td>
<td>19 (68%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years old</td>
<td>23</td>
<td>19 (83%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 years old</td>
<td>24</td>
<td>23 (96%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 years old</td>
<td>24</td>
<td>22 (92%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>98 (79.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3

The number and proportion of children who favor the powerholder in resource allocation in two power situations in Study 2

<table>
<thead>
<tr>
<th></th>
<th>Dominance</th>
<th></th>
<th></th>
<th>Prestige</th>
<th></th>
<th></th>
<th></th>
<th>Wilcoxon test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>test p</td>
<td>N</td>
<td>%</td>
<td>test p</td>
<td>z</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>7 years old (N=24)</td>
<td>11</td>
<td>46%</td>
<td>.84</td>
<td>18</td>
<td>75%</td>
<td>&lt; .05</td>
<td>-1.941</td>
<td>&lt; .05</td>
<td></td>
</tr>
<tr>
<td>8 years old (N=24)</td>
<td>9</td>
<td>38%</td>
<td>.31</td>
<td>16</td>
<td>67%</td>
<td>.15</td>
<td>-2.111</td>
<td>&lt; .05</td>
<td></td>
</tr>
<tr>
<td>Total (N=48)</td>
<td>20</td>
<td>42%</td>
<td>.31</td>
<td>34</td>
<td>71%</td>
<td>&lt; .01</td>
<td>-2.858</td>
<td>&lt; .01</td>
<td></td>
</tr>
</tbody>
</table>
Table 4

*The number and proportion of children who prefer the prestigious powerholder between the dominating and prestigious powerholder in Study 2*

<table>
<thead>
<tr>
<th></th>
<th>Resource allocation</th>
<th>Leader preference</th>
<th>Friendship preference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>Binomial test p</td>
</tr>
<tr>
<td>7 years old (N=24)</td>
<td>21</td>
<td>88%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>8 years old (N=24)</td>
<td>23</td>
<td>96%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Total (N=48)</td>
<td>44</td>
<td>92%</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>
Figure 1. Note. This is one example of the experimental procedure. The upper half is the dominance situation and the lower half is the prestige situation. a-d represent the Manipulate phase and e and f represent the Test phase. In 1a and 2a, three boys picked out their favorite toy from the toy box and wanted to play with the other two boys. 1b shows in the dominance situation, the powerholder (the blue boy) raised his arm and proclaimed that: I am the boss, you all have to listen to me and we must play my favorite toy together; 2b shows in the prestige situation, the powerholder (the yellow boy) gets the most stars granted by their peers and is elected the boss. 1c and 2c indicate that the bosses all finally dictated all boys played the toy chosen by the powerholder but not the toys chosen by the others. In Study 1, these boys played the boss’s favorite toy together the whole afternoon. After playing, the middle boy went home first and the powerholder (right or left) and the subordinate (right or left) remained. In Study 2, 1d and 2d indicated that after final decision, the teacher collected back all the toys due to dinner time, thus all boys did not play any toys. 1e and 2e represent the resource allocation, where children were asked to divide 5 erasers between the powerholder and the subordinate. f represents the liking and leader preference between the prestigious and dominating powerholder.
Figure 2: the proportion of children who favor the powerholder in both power situations at 4- to 8 years in Study 1. Bars represent 95% confidence intervals. ** represents $p < .01$, * represents $p < .05$. 
Figure 3. Percentage of children aged 7-8 years of age favoring the powerholder in the dominance power situation and in the prestige power situation. Bars represent 95% confidence intervals. The asterisk above the bar represents significantly higher or lower than 50% and that inserted in the line represents the difference between studies.

*p < .01; **p < .05.