

Power Fosters Context-Independent, Analytic Cognition

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Abstract

The present research tested the hypothesis that power, defined as the capacity to influence others, promotes analytic cognitive processing, by examining the use of linguistic categories and the categorization of objects. Supporting the hypothesis, recalling instances of influencing others facilitated the use of adjectives and discouraged the use of verbs to describe others (Study 1). Recalling instances of influencing others also promoted taxonomic, instead of thematic, categorization (Study 2). Furthermore, the authors also examined the effect of power in a real-life context. They examined whether socioeconomic status (SES) differences in cognitive processing can be partly explained by sense of agency, an antecedent of power (Study 3); high SES individuals made more taxonomic categorization than did low SES individuals, and a sense of agency partially mediated the SES differences in categorization. These findings underscore the role of power in shaping cognitive processes.

Keywords

power, analytic and holistic cognition, linguistic categories, categorization, SES

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Researchers have defined power as the capacity to influence others (French & Raven, 1959) because of the availability of resources and freedom from constraint (Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003). Power can be rooted in situational factors, such as how much influence one has over the other in actual interactions. Thus, people who can influence others in social interactions are conceived to have more power than those who need to subject themselves and adjust to others' influence. At the same time, power can also be rooted in individual personality factors. One such factor is the need for agency—the need to be the primary cause of one's behavior and to effectively produce changes in the environments (DeCharms, 1968). Thus, people with a strong sense of agency are believed to have more power than those with a weak sense of agency who tend to perceive their behaviors as determined by external forces.

Social psychologists have suggested that power plays a crucial role in guiding cognition (Fiske, 1993; Keltner et al., 2003). For example, powerful people are likely to attend to stereotype-confirming information of powerless people, either because they lack cognitive resources and motivation to carefully attend to the powerless or because they want to maintain the status quo (Fiske & Dépret, 1996; also see Overbeck & Park, 2001; Vescio, Snyder, & Butz, 2003). Power has also been shown to guide even basic cognitive processes. Although powerless people tend to process information in a more local or lower level way, powerful people tend to process information in a more global way by categorizing stimuli at a superordinate, inclusive level, arguably because

powerful people feel psychologically distant from other people (Smith & Trope, 2006).

Here, we propose that power also influences “analytic” versus “holistic” (or context-independent vs. context-dependent) cognitive processes (Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001). Analytic cognition is characterized by processing a focal object and its features independently from the surrounding context, whereas holistic cognition is characterized by processing relationships and contextual information. It is important to note that although the terms *global* and *holistic* are often used interchangeably, they are independent constructs (Kimchi, 1992). Although *global* cognitive processing is the processing of properties at a hierarchically higher level of structure (Navon, 1977), *holistic* cognitive processing (also called *configural* or *emergent*; Garner, 1978; Pomerantz & Pristach, 1989; Rock, 1986; Treisman, 1986) is the processing of interrelations between component parts and/or contexts. Holistic cognitive processing is thus the processing of relational and contextual properties and can happen at either local or global levels of hierarchical structure.

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Exerting influence over others requires one to focus on one's own goal and how to achieve it without being distracted by surrounding contexts (at least in the United States; Miyamoto & Wilken, 2010). When influencing others, those to whom one's goal is directed are more salient than the surrounding contexts. Because attention guides reasoning (Taylor & Fiske, 1978), power may foster cognitive processing of focal objects rather than the surrounding contexts (i.e., analytic cognitive processing). This may lead individuals to identify objects in terms of their central features and categorize them based on such features. On the other hand, being subject to others' influence and thus adjusting to others requires one to attend less to one's own goal and more to the demands of others and situations. Because of the need to attend to these relational and contextual factors, adjusting to others may foster processing of contextual information in general (i.e., holistic cognitive processing). This may lead individuals to identify objects in terms of their relationships with other objects and the surrounding context and categorize the objects based on these relationships. Miyamoto and Wilken (2010) showed partial support for this possibility using the Framed-Line Test (Kitayama, Duffy, Kawamura, & Larsen, 2003), a visual perception task. Individuals who had influence over others were better than those who needed to adjust to others at attending to the focal features of objects and ignoring contextual information, thus showing an analytical perceptual style (at least in Western cultures; also see Guinote, 2007). Although these findings suggest that power guides analytical visual attention, it is unclear whether power also has broader *cognitive* consequences.

In addition to examining how power promotes analytic cognitive processing in a laboratory setting, the present study also sought to examine the effect of power in a real-life context. This is possible because recent research has shown cognitive differences associated with socioeconomic status (SES). High SES is typically characterized by greater educational attainment and higher income, which confer power to those individuals with high SES by providing them with more control over resources and less constraint compared to other individuals (Domhoff, 2006). Compared to people with lower educational attainment (i.e., low SES), those with higher educational attainment (i.e., high SES) are more likely to show analytic cognitive processing (Na et al., 2010). If power promotes analytic cognitive processing, it is reasonable to expect that power may underlie SES differences in cognitive processing. We thus examined whether SES differences in cognitive processing can be partly explained by sense of agency—one of the antecedents of power.

The present research tested whether effects of power extend to cognitive processes associated with holistic and analytic cognitive styles in general, by examining two types of cognitive processing: the use of descriptive words and categorization. We argue that power can facilitate not only global processing, as shown by Smith and Trope (2006), but also analytic processing. Influencing others may require

individuals to attend to the big picture (i.e., global processing) while not being distracted by contextual or relational information (i.e., analytic processing). We also predicted that, compared to low SES individuals, high SES individuals should perceive their behaviors to be determined by themselves, thus having a higher sense of agency, and those who have a higher sense of agency should show analytic cognitive processing.

Study 1: Power and the Use of Words

Study 1 examined whether power leads to the use of different words to describe others. According to the linguistic category model (LCM; Semin & Fiedler, 1988), people and behaviors can be described using different words. For example, the same person can be described as someone who "helps others" or "is kind." The choice of different linguistic categories conveys different information and inferences (Semin & Fiedler, 1988; Semin & Greenslade, 1985). Verbs, such as *help*, form a linguistic category that conveys information about the context and the relationship between the person and the object; on the other hand, adjectives, such as *kind*, provide information about the disposition of the person with limited information about the context. Because influencing others fosters attention to the features of focal targets (Miyamoto & Wilken, 2010), we predicted that it should also foster the use of adjectives, which reveal features of those focal targets. At the same time, because being subject to others' influence fosters attention to contextual information, we predicted that it should also foster the use of verbs, which convey contextual and relational information.

Study 1 thus examined the effects of power on the use of adjectives and verbs when describing others. We manipulated power by asking participants to recall situations in which they influenced, adjusted to, or interacted with (i.e., neutral condition) other people. In a subsequent, ostensibly unrelated task, participants described another student. The numbers of adjectives and verbs used in the description were coded.

Method

Participants. Participants were 50 European American undergraduate students (27 female and 23 male) enrolled at the University of Wisconsin–Madison. They participated in small groups (maximum of 4 participants) and were given course credit for an introductory psychology class.

Procedure. Participants were told that the study was examining various aspects of human cognition and that they would work on two (allegedly) unrelated tasks: an episodic memory task and a verbal description task. The first task, the episodic memory task, was a manipulation of power that asked participants to briefly describe interpersonal situations. Participants were randomly assigned to one of the three conditions: influence ($n = 17$), adjustment ($n = 18$), and neutral ($n = 15$).

Table 1. Mean Numbers and Ratios of Coded Descriptions as a Function of Condition (Study 1)

Category	Influence				Neutral				Adjustment			
	Frequency		Ratio		Frequency		Ratio		Frequency		Ratio	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Adjectives	5.83	1.98	0.70	0.25	5.27	1.98	0.64	0.24	4.61	2.20	0.53	0.25
Verbs	1.88	2.00	0.21	0.21	2.27	2.55	0.27	0.28	3.33	2.57	0.37	0.25
State verbs	0.47	0.62	0.05	0.06	1.13	0.36	0.13	0.16	1.78	2.05	0.19	0.20
Interpretive action verbs	1.00	1.27	0.11	0.14	0.93	1.39	0.11	0.16	1.22	1.48	0.14	0.15
Descriptive action verbs	0.41	0.62	0.05	0.07	0.20	0.56	0.02	0.06	0.33	0.59	0.04	0.07

Participants in the influence condition were asked to recall two situations in which they had *influenced or changed* other people according to their own wishes, whereas those in the adjustment condition were asked to recall two situations in which they had *adjusted* themselves to the wishes of others. Participants in the neutral condition were asked to recall two situations in which they had *interacted* with others.¹

Subsequently, participants were asked to complete the person description task, which was adapted from Maass, Karasawa, Politi, and Suga (2006, Study 2). They were asked to think about a student of the same sex whom they knew very well and to “describe what type of person s/he is or what s/he does at school/work.” Maass et al. found that although Western respondents tend to use adjectives predominantly and rarely used verbs when they describe others in general, they tend to use both verbs and adjectives when they describe others in specific contexts. Thus, participants were asked to describe the target person in specific school or work contexts to avoid any floor effects. Participants were provided with eight empty lines for their response.

Finally, participants completed measures of perceived influence and adjustment, respectively, as a manipulation check (Miyamoto & Wilken, 2010). These measures involved a set of seven Venn-like diagrams, varying in the degree of overlap between two transparent circles, each representing the self and the other (see the appendix). The degree to which the “self” circle covered the “other” circle represented how much the self exerted influence over the other person (influence scale), whereas the degree to which the “other” circle covered the “self” circle represented how much the self adjusted to the other person (adjustment scale). Participants reported perceived influence and adjustment for each of the two situations they described in the episodic memory task using the diagrams as a 7-point scale. The means were computed for perceived influence and perceived adjustment across the two situations, respectively.

Results and Discussion

Data coding. According to the LCM (Semin & Fiedler, 1988), adjectives convey less contextual information than verbs. In addition, the LCM distinguishes among three different types of verbs: state verbs (SVs; e.g., “he likes math”),

interpretive action verbs (IAVs; e.g., “he helps others”), and descriptive action verbs (DAVs; e.g., “he walks fast”). The three types of verbs differ in their cognitive implications. Although SVs refer to psychological states (e.g., *like*), IAVs refer to a general class of behaviors (e.g., *help*) and DAVs refer to a specific action (e.g., *walk*). Two coders who were blind to experimental condition coded the total number of adjectives and the three different types of verbs (SVs, IAVs, and DAVs) participants used to describe the target person in the word association task (intraclass correlation was .99 for adjectives, .93 for SVs, .92 for IAVs, and .88 for DAVs).² Because some participants listed multiple descriptions in a single response space (e.g., “she is confident and self-assured”) and thus provided a larger number of descriptions than others, we divided the number of adjectives and verbs (i.e., SVs, IAVs, and DAVs) by the total number of descriptions each participant provided to compute ratios for each category. Descriptive statistics of the coded categories are summarized in Table 1.

Manipulation check. A condition (influence, neutral, and adjustment) \times scale (influence vs. adjustment) mixed ANOVA was conducted. There was a main effect of condition, $F(1, 47) = 3.75, p < .05$, which was qualified by a significant interaction between condition and scale, $F(1, 47) = 28.80, p < .001$. Simple interactions showed that participants in the influence condition felt that they influenced others ($M = 5.50, SD = 0.87$) more than they adjusted to others ($M = 3.79, SD = 1.40$), $t(47) = 5.19, p < .001$, whereas participants in the adjustment condition felt that they adjusted to others ($M = 5.00, SD = 1.01$) more than they influenced others ($M = 3.22, SD = 1.15$), $t(47) = 5.56, p < .001$. In the neutral condition, ratings of perceived influence ($M = 3.67, SD = 1.38$) and adjustment ($M = 3.60, SD = 1.61$) did not differ from one another, $t(47) = 0.20, ns$. These findings suggest that the manipulation had the intended effects.

Adjectives and verbs. It was predicted that participants who recalled influencing others would be more likely to use adjectives than those who recalled adjusting to others and that those who recalled simply interacting with others (i.e., neutral condition) should fall between the other two groups. A one-way ANOVA with linear contrast weights tested the effect of condition (influence, neutral, and adjustment) on each of the word types. As shown in Figure 1, supporting our

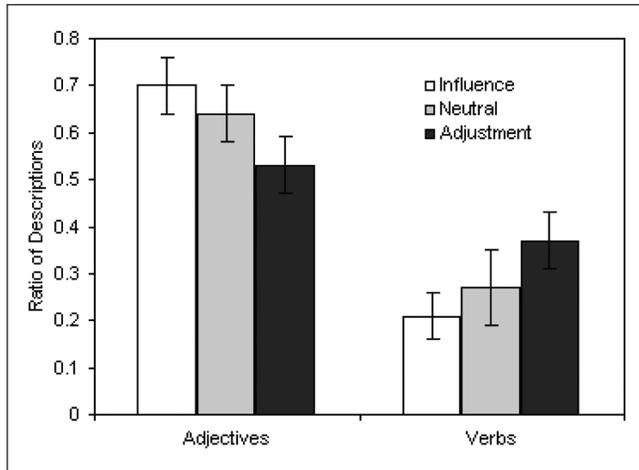


Figure 1. The ratio of adjective vs. verb descriptions by condition (Study 1)
Error bars represent standard errors.

hypothesis, the likelihood of using adjectives to describe another student increased as participants were primed with situations that involved more power, $F(1, 47) = 4.10, p < .05$. An opposite trend was found for verbs, $F(1, 47) = 3.57, p < .07$; the likelihood of using verbs increased as participants were primed with situations that involved less power. Furthermore, the effect of power on specific types of verbs was explored. The likelihood of using SVs to describe another student increased as participants were primed with situations that involved less power, $F(1, 47) = 6.97, p < .05$. There were no linear effects of condition on the ratio of IAVs or DAVs, $F_s < 1$. These results suggest that the effect of power on verb use is especially pronounced for the description of psychological states (i.e., SVs).

Study 1 found that exerting power facilitates the use of adjectives (which convey information about the features of the person) and discourages the use of verbs (which provide information about the context and relationship between the person and the object). As far as we know, these findings are the first to suggest an association between power and the processing style that individuals use to represent and describe others.

Study 2: Power and Categorization

The words individuals use to describe people, objects, and events can be associated with how they categorize them. Researchers have distinguished between taxonomic and thematic strategies to categorize objects (Markman, 1989; Markman & Hutchinson, 1984). Taxonomic categorization is based on features that are shared by the objects (i.e., whether the objects share properties, appearance, or function), whereas thematic categorization is based on spatial, causal, or temporal relationships among the objects (i.e., whether the objects are jointly involved in a theme or context). For example, in a typical task used to examine categorization,

respondents are given a set of three words, such as *carrot*, *eggplant*, and *rabbit*, and asked to choose the two that go together. Grouping *carrot* and *eggplant* indicates taxonomic categorization (because both are vegetables), whereas grouping *carrot* and *rabbit* indicates thematic categorization (because rabbits eat carrots). In a longitudinal study with children, Dunham and Dunham (1995) showed that the frequency of taxonomic categorization at the age of 3 is predicted by the use of adjectives (e.g., *that yellow*) at the age of 2, whereas the frequency of thematic categorization at 3 is predicted by the use of relational terms at 2, such as the combination of a verb and a preposition (e.g., *go in there*). Given the close association between the use of words (adjectives vs. verbs) and categorization, it is hypothesized that influencing others facilitates the use of both adjectives and taxonomic categorization, thus giving rise to an analytic cognitive processing in general. On the other hand, adjusting to others encourages the use of both verbs and thematic categorization, thus leading to a holistic cognitive processing in general.

Study 2 thus examined whether power guides categorization using the categorization task of Ji, Zhang, and Nisbett (2004). As in Study 1, power was manipulated by asking participants to recall situations in which they had either influenced or adjusted to other people. Subsequently participants worked on the categorization task.

Method

Participants. Participants were 37 European American undergraduate students (24 female and 13 males; 17 in influence and 20 in adjustment conditions) enrolled at the University of Wisconsin–Madison. They participated in a small group (maximum of 4 participants) and received course credit for participation.

Procedure. As in Study 1, participants were told that the study was examining various aspects of human cognition and that they would work on two (ostensibly) unrelated tasks: an episodic memory task and a word association task. The episodic memory task was identical to that in Study 1, except that it did not include the neutral control condition. Participants were asked to recall two situations in which they either influenced or adjusted to other people.³ Subsequently, they were asked to complete the word association task. Participants were presented with 12 sets of three words and asked to indicate which two of the three in each set were most closely related and why. There were 8 test items and 4 filler items. For example, one test set consisted of *seagull*, *sky*, and *dog*. The response was coded as taxonomic if the grouping was based on shared features or categorical membership (e.g., *seagull* and *dog* because both are animals) and as thematic if the grouping was based on object–context or subject–object relationship (e.g., *seagull* and *sky* because seagulls fly in the sky).⁴ Finally, participants filled out the same manipulation check measures of perceived influence and adjustment as used in Study 1.

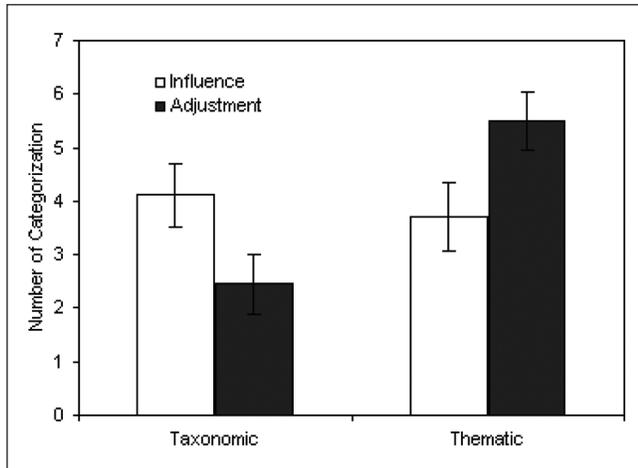


Figure 2. The number of taxonomic vs. thematic categorizations by culture (Study 2). Error bars represent standard errors.

Results and Discussion

Manipulation check. A condition (influence vs. adjustment) \times scale (influence vs. adjustment) mixed-design ANOVA was conducted. There was a main effect of condition, $F(1, 35) = 5.47$, $p < .05$, which was qualified by a significant interaction between condition and scale, $F(1, 35) = 32.42$, $p < .001$. Although participants in the influence condition felt that they influenced others ($M = 4.94$, $SD = 0.70$) more than they adjusted to others ($M = 3.82$, $SD = 1.60$), $t(35) = 3.00$, $p < .01$, participants in the adjustment condition felt that they adjusted to others ($M = 4.63$, $SD = 0.97$) more than they influenced others ($M = 2.85$, $SD = 1.11$), $t(35) = 5.19$, $p < .001$, suggesting that the manipulation was effective.

Taxonomic versus thematic categorization. It was predicted that participants who recalled influencing others would be more likely to categorize based on taxonomic relationships than those who recalled adjusting to others would, whereas those who recalled adjusting to others would categorize based more on thematic relationships than those who recalled influencing others would. As shown in Figure 2, participants in the influence condition made more taxonomic categorizations ($M = 4.12$, $SD = 2.45$) than did those in the adjustment condition ($M = 2.45$, $SD = 2.46$), $t(35) = 2.06$, $p < .05$. Those in the adjustment condition made more thematic categorizations ($M = 5.50$, $SD = 2.46$) than did those in the influence condition ($M = 3.71$, $SD = 2.62$), $t(35) = 2.15$, $p < .05$ (the numbers of taxonomic and thematic categorizations were highly negatively correlated, $r = -.99$).

The results from Studies 1 and 2 suggest that exerting power facilitates the use of both adjectives (which convey information about features) and taxonomic categorization (which is based on features shared by the objects), whereas being subject to others' power promotes the use of both verbs (which convey the information about the context and the relationships) and thematic categorization (which is

based on relationships between objects). These findings provide converging evidence that exerting power leads to more analytic cognitive processing, whereas being subject to others' power leads to more holistic cognitive processing.

Study 3: SES, Categorization, and Sense of Agency

Studies 1 and 2 demonstrated the effects of power on cognitive processing. Previous studies have shown an association between SES and attributional styles. Individuals with higher income (one index for SES) were less likely than those with lower income to attribute both wealth and poverty to external structural reasons (Kluegel & Smith, 1986), thus showing a more analytic cognitive style. In addition, individuals with a higher subjective social status, those who perceived themselves to have a higher standing in the local community, also made less contextual attributions compared to those with lower subjective SES (Kraus, Piff, & Keltner, 2009). Furthermore, SES differences are not confined to attributional tasks. Na et al. (2010) have shown that, compared to people with lower educational attainment (another index for SES), those with higher educational attainment are more likely to attend to focal features and marginally more likely to make taxonomic categorizations. Grossmann and Varnum (2011) have also found that, in both the United States and Russia, college students whose parents have a higher educational attainment are more likely to show a focused attentional style, thus showing analytic perceptual styles.

Thus, in Study 3, we examined the hypothesis that power underlies SES differences in categorization. We sought to extend these previous findings in two ways. First, despite a growing body of evidence showing SES differences in cognitive styles, there is limited evidence regarding the mechanism underlying SES group differences. Kraus et al. (2009) showed that a sense of control mediated the link between subjective social status and attribution. Although these findings provide support for the present hypothesis regarding power and SES differences in cognitive styles, subjective measures of social status and objective measures of SES are related but independent constructs (e.g., Adler et al., 2008). Therefore, whether individual difference factors that are known to be antecedents of power (e.g., a sense of control and agency) also underlie cognitive differences associated with *objective* indicators of SES is not known. Second, aside from Kluegel and Smith (1986), all of the previous findings on SES differences in cognition have examined either college students or community samples of adults who tend to have higher SES backgrounds compared to the general population in the United States. It is unclear whether the association between SES and cognitive processing exists when individuals with lower SES, who are more representative of the U.S. population, are examined. The present research thus sought to test the link between objective SES and cognitive styles using a more representative sample of adults and to examine whether a perceived sense of agency mediates the link between SES and cognitive styles.

Table 2. Correlations Among Categorization, Demographic Variables, and Psychological Variables (Study 3)

	Taxonomic	Thematic	Age	Sex	Education	Income	Agency
Taxonomic	—						
Thematic	-.98***	—					
Age	-.01	-.01	—				
Sex	-.06*	.08**	.00	—			
Education	.23***	-.22***	-.12***	-.15***	—		
Income	.16***	-.15***	-.13***	-.30***	.33***	—	
Agency	.12***	-.11***	.02	-.09**	.17***	.13***	—
M	2.68	5.07	64.43	1.53	14.08	42,117	4.48
SE	(1.98)	(2.13)	(6.89)	(0.50)	(2.60)	(57,811)	(0.72)

For sex, 1 = male, 2 = female.

* $p < .05$. ** $p < .01$. *** $p < .001$. Standard deviations are shown in parentheses.

SES has been typically assessed by educational attainment (Na et al., 2010; Snibbe & Markus, 2005) or income (Kluegel & Smith, 1986, measured both educational attainment and income). Because these various indicators of SES assess different aspects of SES, the American Psychological Association's Task Force on Socioeconomic Status (2007) recommends assessing each dimension separately rather than combining them into a single indicator of SES. The present research thus focused on both educational attainment and income as independent indicators of SES.

Method

Respondents. We used the data from the Wisconsin Longitudinal Study (WLS), which is based on a random sample of more than 10,000 males and females who graduated from Wisconsin high schools in 1957. The researchers for the WLS also interviewed a random sample of siblings of the original graduates via telephone and mail surveys. The present analyses are based on 1,223 sibling respondents (572 males and 651 females) who reported their educational attainment and income, responded to psychological measures on a mail survey, and completed the categorization task over the phone from 2004 to 2007. The age of the respondents ranged from 34 to 86 years ($M = 64.43$, $SD = 6.89$). The WLS includes respondents from a wide range of social strata and thus provides a relatively representative sample from Wisconsin.⁵

SES indices: Educational attainment and income. SES was operationalized as educational attainment and income. Respondents indicated their total years of education based on their highest degree and their personal income. On average, respondents in the present sample had 14.08 years of education ($SD = 2.60$). Of respondents, 40% had never attended college. In addition, respondents in the present sample earned, on average, \$42,117 ($SD = 57,810$).

Perceived sense of agency. One of the antecedents of power is a need for general agency (i.e., being the primary cause of one's behavior). As an index of perceived sense of agency, we used the Autonomy subscale of the Psychological Well-Being Scale (Ryff, 1989) because a sense of autonomy is

closely tied to a sense of agency (Ryan & Deci, 2000); autonomous functioning individuals are those who have a sense that they regulate their behavior from within and are free from the norms imposed by others (Ryff, 1989) and thus are the causes of their own actions. The Psychological Well-Being Scale is a widely used instrument, which has been linked with sociodemographic characteristics and personality characteristics (e.g., Keyes, Shmotkin, & Ryff, 2002). The WLS includes five items of the Autonomy subscale (e.g., "I have confidence in my opinions even if they are contrary to the general consensus," "I tend to be influenced by people with strong opinions" [reverse coded]). Responses are made on a 6-point rating scale, ranging from *strongly disagree* to *strongly agree*. The subscale had relatively low reliability (Cronbach's $\alpha = .60$) that is probably the result of the reduced number of items included in the WLS compared to the original long form. Such a low reliability diminishes the power to detect the relationship between the perceived sense of agency and other variables, which could work against the present hypothesis.

Categorization task. The categorization task was conducted by phone. The interviewer read three words and asked respondents to indicate the two that were most closely related. Twelve sets of words, identical to those used in Study 2, were used in Study 3. However, respondents were not asked to describe a reason for their categorization because of the nature of the large-scale survey.

Results and Discussion

Correlations among variables are summarized in Table 2. To test the hypothesis that educational attainment and income are linked to cognitive styles and that these links are mediated by the perceived sense of agency, series of multiple regressions were performed separately for educational attainment and income, as summarized in Figure 3. Age and sex were controlled for in all of the regression models.

Educational attainment. As seen in Figure 3a, in the regression analysis, educational attainment significantly predicted the number of taxonomic categorizations, $\beta = .23$, $t(1219) = 8.10$,

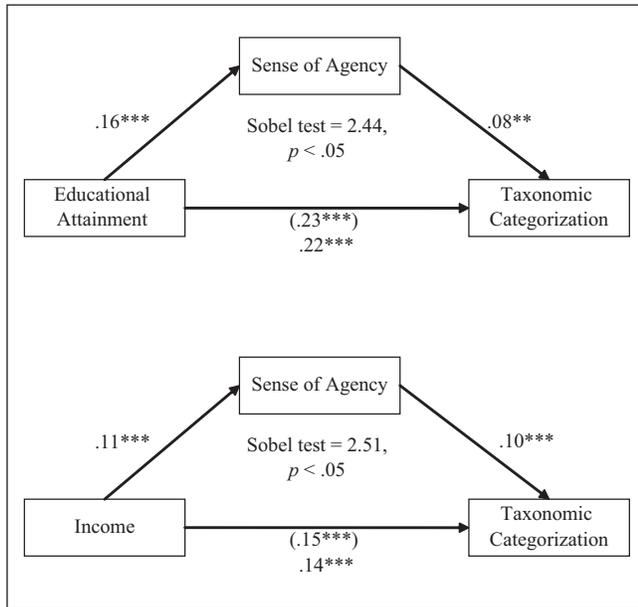


Figure 3. The mediation analyses of SES differences in categorization (Study 3)
Regression coefficients are standardized coefficients. ** $p < .01$;
*** $p < .001$.

$p < .001$; those with higher educational attainment made a larger number of taxonomic categorizations than did those with lower educational attainment. The sense of agency was a significant mediator of the educational differences in taxonomic categorizations, Sobel test $z = 2.44$, $p < .05$.⁶ Educational attainment predicted the sense of agency, $\beta = .16$, $t(1219) = 5.59$, $p < .001$. Furthermore, the sense of agency predicted the number of taxonomic categorizations, even after controlling for educational attainment, $\beta = .08$, $t(1218) = 2.70$, $p < .01$; those who had a high sense of agency tended to make more taxonomic categorizations than did those who had a low sense of agency. At the same time, the direct path from education attainment to the number of taxonomic categorizations remained significant even after controlling for the sense of agency, $\beta = .22$, $t(1218) = 7.60$, $p < .001$, which suggests that there are multiple causes of educational differences in categorization and the sense of agency only partially mediated this path.

Income. As seen in Figure 3b, income significantly predicted the number of taxonomic categorizations, $\beta = .15$, $t(1219) = 5.11$, $p < .001$; those with higher income made a larger number of taxonomic categorizations than did those with lower income. Income predicted the sense of agency, $\beta = .11$, $t(1219) = 3.78$, $p < .001$. Furthermore, the sense of agency predicted the number of taxonomic categorizations, even after controlling for income, $\beta = .10$, $t(1218) = 3.36$, $p < .05$. The sense of agency was a significant mediator of the income differences in taxonomic categorizations, $z = 2.51$, $p < .05$.⁷ However, the direct path from income to the number of taxonomic categorizations remained significant even

after controlling for the sense of agency, $\beta = .14$, $t(1218) = 4.74$, $p < .001$, suggesting that there are other factors that are responsible for the income differences in categorization.

These findings suggest that power is, in fact, linked to an analytic cognitive processing style. Specifically, using a sample that is more representative than in previous studies, Study 3 found that SES is associated with the extent to which people make taxonomic and thematic categorizations. Furthermore, individual differences in a sense of agency, one of the antecedents of power, partially accounted for cognitive differences associated with SES. This indicates that power underlies SES differences in cognitive processing. At the same time, the direct link between SES and categorization remained significant even after controlling for a sense of agency, suggesting that SES differences in cognition are not only attributable to power but also caused by other factors. For example, part of the reason why higher educational attainment is associated with taxonomic categorization could be the result of the content of education; higher education may train individuals to acquire an analytic thinking style. Similarly, part of the reason why higher income is associated with taxonomic categorization could be the result of the nature of sources of income; individuals with high income may be more likely to have jobs that require and foster an analytic thinking style.

General Discussion

The present research provided at least two novel findings: It showed, first, that power fosters analytic (rather than holistic) cognitive processing in general and, second, that power underlies SES differences in cognitive processing. Recalling incidents of influencing others facilitated the use of adjectives and taxonomic categorization in a subsequent task, whereas recalling incidents of adjusting to others promoted the use of verbs and thematic categorization. These findings suggest that exerting power over others leads to analytic cognitive processing, whereas subjecting the self to the influence of others leads to holistic cognitive processing. Furthermore, using a regionally representative sample, Study 3 not only replicated previously reported SES differences in cognitive processing but also showed how power explains some of SES differences. Although previous studies have examined the effects of power on cognitive processes and SES differences in cognitive processes, the two areas of research have not yet been connected with each other as they have been in the present research. By highlighting the central role that power plays in guiding basic cognitive processes, the present research bridges these two areas and contributes to both.

Cross-cultural studies have repeatedly documented that Easterners are more likely than Westerners to engage in holistic, context-dependent cognitive processing (Nisbett, 2003; Nisbett et al., 2001). The present research shows that even within Western cultures, people may engage in holistic,

context-dependent cognitive processing, depending on the amount of power one has; within Western cultures, recalling incidents of adjusting to others and living in low SES contexts were associated with holistic cognitive processing. It is important to note that the present research was conducted only in Western cultures, and thus whether cognitive effects of power and SES can be generalized to other cultures is not known. In fact, Snibbe and Markus (2005) suggested that both high and low SES individuals in the United States are embedded in and influenced by larger independent cultural contexts.⁸ Furthermore, Miyamoto and Wilken (2010) found that the *perceptual* consequences of power are contingent on cultures; In the United States, power was associated with an analytic, focused perceptual style, possibly because such an analytic perceptual style serves cultural imperatives to pursue self-defined goals independently from social contexts (Markus & Kitayama, 1991). This pattern was absent or weakly reversed in Japan, where the primary imperative—to fulfill socially prescribed roles and fit into social contexts—may require

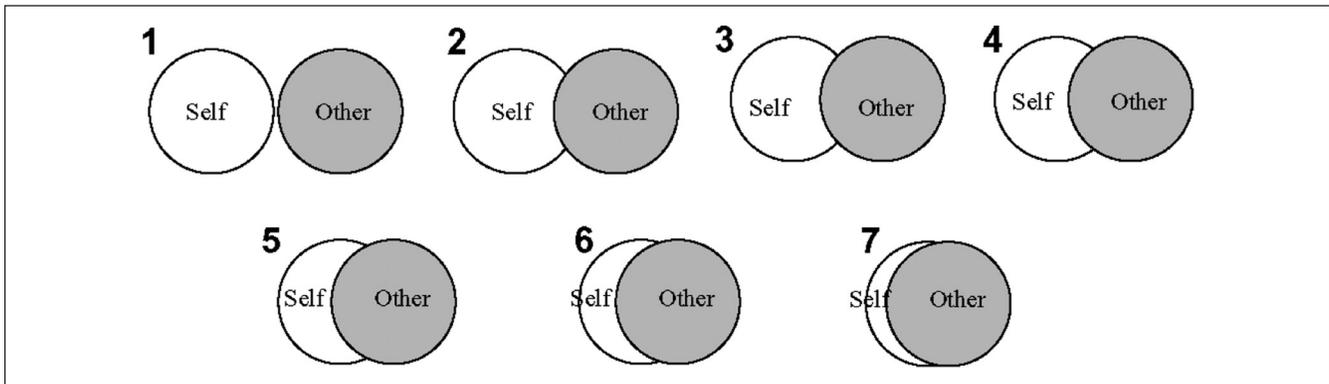
people to attend to and process contextual information even when they exert power over others. Therefore, a fruitful next step for future research would be to examine whether *cognitive* effects of power and SES also differ across cultural contexts.

The present research tested a potential factor underlying variations in cognitive processing and thus sheds light on why certain individuals or contexts are more conducive to analytic or holistic cognitive processing. In fact, we found that power underlies some of the SES differences in cognitive processing. It is possible that power may also underlie other types of cognitive differences, such as regional differences in cognitive processing (e.g., Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009) and may also help to identify other sociocultural contexts that lead to divergent cognitive processing. In summary, the present findings suggest that people’s cognitive processing varies in response to the demands of social-cultural contexts they are in and highlight the importance of situating cognitive processing in social-cultural contexts.

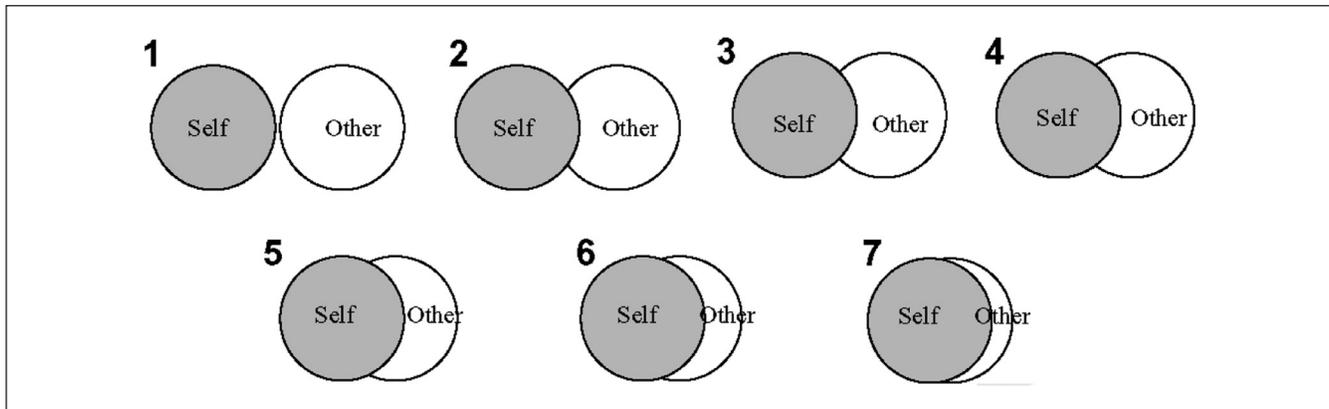
Appendix

Measures of Perceived Adjustment (Top) and Influence (Bottom) Used as a Manipulation Check in Studies 1 and 2

How much do you think you *adjusted* to the other(s) in this event? Please circle the number that best describes the interaction.



How much do you think you *influenced* the other(s) in this event? Please circle the number that best describes the interaction.



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Notes

1. Because temporal distance has been shown to influence cognitive processing (Trope & Liberman, 2003), we also asked participants to report when the events happened to rule out the possibility that our manipulation was confounded with temporal distance. The three conditions did not differ in how long ago the situations had happened ($Mdn = 120$ days ago), Kruskal–Wallis $\chi^2(df = 2) = 3.75, p > .1$.
2. Although we had no specific hypothesis about nouns, we also coded nouns for exploratory purposes (intraclass correlation was .94) and found no linear effect of condition on the ratio of nouns ($M_s = 0.09, 0.09, \text{ and } 0.10, SD_s = 0.12, 0.10, \text{ and } 0.12$, for influence, neutral, and adjustment conditions, respectively).
3. Following Study 1, we also asked participants to report when the events happened. There was no effect of condition on how long ago the event had happened ($Mdn = 165$ days ago), Mann–Whitney $U = 155, z = 0.46, p > .6$.
4. Both grouping and explanation have to be consistent for a response to be coded as thematic, or taxonomic. There were only three cases in total where participants' explanations for categorization were neither taxonomic nor thematic (e.g., choosing corn and bread out of corn–bread–farmer because “I like cornbread”). These three cases were not coded as either taxonomic or thematic.
5. The Wisconsin Longitudinal Study does not have a nationally representative sample. The sample was predominantly White, reflecting the demographics of Wisconsin in 1957, and all of the original respondents graduated from high school. However, not all of the siblings of the original respondents graduated from high school. The present analysis is based on the sibling respondents.
6. Since the numbers of taxonomic and thematic categorization were highly negatively correlated ($r = -.98$), a parallel mediation effect was found for thematic categorization, Sobel test $z = 2.40, p < .05$. Educational attainment predicted the sense of agency, $\beta = .16, t(1219) = 5.59, p < .001$, and the sense of agency negatively predicted the number of thematic categorizations,

even after controlling for educational attainment, $\beta = -.08, t(1218) = 2.67, p < .01$.

7. A parallel mediation effect was found for thematic categorization, Sobel test $z = 2.48, p < .05$. Income predicted the sense of agency, $\beta = .11, t(1219) = 3.78, p < .001$, and the sense of agency negatively predicted the number of thematic categorizations, even after controlling for income, $\beta = -.09, t(1218) = 3.28, p < .001$.
8. Specifically, Snibbe and Markus (2005) found that lyrics of country music, which is preferred more by high school graduates than by college graduates, emphasized resisting influence (e.g., “born to be wild”) marginally more than lyrics of rock music, which is preferred more by college graduates. This suggests that resisting influence, and thus being the cause of one's actions (i.e., being agentic), is ideal even among high school graduates, probably because both high school graduates and college graduates in the United States are placed in independent cultural contexts that value agency. It is interesting to note that, on the surface, this may seem to contradict our present findings, which showed that high SES individuals have a higher sense of agency than low SES individuals. However, it should be noted that what is endorsed or considered to be ideal is not necessarily the same as what is actually experienced (Tsai, Knutson, & Fung, 2006). The measure of agency used in the present study asks individuals to report their perceived (or actual) level of agency instead of their ideal level of agency. The fact that educational attainment and income positively predicted a sense of agency in the present study may suggest that individuals with lower educational attainment and lower income perceive themselves to be less agentic, even though they may ideally prefer to be more agentic.

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