

Thanks, but No Thanks: Unpacking the Relationship Between Relative Power and Gratitude

Personality and Social
Psychology Bulletin
1–19

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DOI: 10.1177/01461672211025945
journals.sagepub.com/home/pspb



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Abstract

Power and gratitude are universal features of social life and impact a wide range of intra- and interpersonal outcomes. Drawing on the social distance theory of power, we report four studies that examine how relative power influences feelings and expressions of gratitude. An archival analysis of author acknowledgements in published academic articles ($N = 1,272$) revealed that low-power authors expressed more gratitude than high-power authors. A pre-registered experiment ($N = 283$) involving live conversations online found that having relatively low power caused increased feelings and expressions of gratitude after benefiting from a favor. Another pre-registered experiment ($N = 356$) demonstrated that increased interpersonal orientation among lower power individuals and increased psychological entitlement among higher power individuals drove these effects. Finally, an archival analysis of conversational exchanges ($N = 136,215$) among Wikipedia editors revealed that relational history moderated the effect of relative power on gratitude expression. Overall, our findings highlight when and why relative power influences feelings and expressions of gratitude.

Keywords

power, gratitude, entitlement, interpersonal orientation, hierarchy

Received January 18, 2020; revision accepted May 18, 2021

Feeling and expressing gratitude are integral to daily life and result in greater daily positive affect and self-esteem (Kashdan et al., 2006), increased job satisfaction (Waters, 2012), and higher levels of various indicators of well-being (Emmons & McCullough, 2003). Furthermore, feeling and reflecting on gratitude have been shown to increase positive affective well-being (Kaplan et al., 2014) and decrease perceived stress and depressive symptoms (Cheng et al., 2015). In organizations, leaders' gratitude expression can spark a ripple of reciprocity as employees experience increased positive emotions (Algoe et al., 2016) and feelings of social worth (Cho & Fast, 2012).

Although researchers have documented numerous downstream consequences of feeling and expressing gratitude, less is known about the *antecedents* of these important outcomes. Existing work has tended to focus on the nature of the helping task (Lee et al., 2018) while overlooking the interpersonal relationship between the favor giver and the favor recipient and the intrapersonal psychology of the favor recipient. This is a problematic shortcoming because scholars have pointed out that “gratitude is largely influenced by the social context where helping exchanges take place and not all instances of help necessarily lead to receipt of gratitude” (Lee et al., 2018, p. 3; see also Algoe et al., 2010). Thus, an open and critical question is why some instances of help

result in the recipient feeling and expressing gratitude while others do not.

We propose that the power dynamic between two individuals is a crucial predictor of feeling and expressing gratitude. According to the social distance theory of power (Magee & Smith, 2013), the asymmetric dependence that characterizes power relations produces asymmetric social distance, with relatively lower-power (vs. higher-power) individuals demonstrating more concern with and responsiveness to the behaviors and characteristics of their interaction partners. In addition, this asymmetric dependence can generate feelings of entitlement because high-power individuals expect low-power individuals to appease them in various ways (Magee & Smith, 2013).

We elaborate on the social distance theory of power by examining two mechanisms linking relative power to expressions and feelings of gratitude. Specifically, we propose that

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lower-power favor recipients experience a greater interpersonal orientation than higher-power favor recipients which increases their expression and feeling of gratitude, whereas higher-power favor recipients experience a greater sense of psychological entitlement than lower-power favor recipients which decreases their expression and feeling of gratitude. In addition, we embrace perspectives that highlight the inherently interpersonal nature of power (Magee & Smith, 2013; Smith & Magee, 2015) in testing a moderator of the effect of relative power on gratitude expression: the relational history between the two parties.

Relative Power, Gratitude Expression, and Felt Gratitude

Central to our theorizing are theoretical perspectives and empirical insights suggesting that low power focuses individuals outward toward others, whereas high power increases an inward focus on the self and one's own contributions (Galinsky et al., 2015; Magee & Smith, 2013; Rucker et al., 2018; Williams, 2014). These relational perspectives on power align with the inherently relational nature of gratitude which, according to the find-remind-and-bind theory of gratitude (Algoe, 2012), "helps one to find new or remind one of current good relationship partners and to bind the two more strongly together" (Algoe et al., 2016, p. 1). Importantly, the find-remind-and-bind theory of gratitude emphasizes a relational appraisal of the situation, which departs from prior economic accounts of gratitude (Algoe, 2012). We propose that power—reflected in the degree of interdependence between interaction partners (Kelley et al., 1983; Kelley & Thibaut, 1978; Magee & Smith, 2013)—is an important component of that relational appraisal and is likely to influence both expressions and feelings of gratitude.

Gratitude expression serves instrumental purposes for low-power individuals due to the asymmetric dependence that characterizes power relations (Emerson, 1962; Fiske & Berdahl, 2007; Magee & Galinsky, 2008). To meet their goals, low-power individuals depend crucially on the perceptions and evaluations of higher-power others. As a result, low-power individuals are likely to be especially attuned to the behaviors and expectations of higher-power others who have the authority to punish and reward them (Keltner et al., 2003). Thus, lower-power favor recipients are likely to be especially motivated to express large amounts of gratitude to higher-power favor givers as a means of meeting normative expectations and avoiding punishment. Therefore, we propose the following hypothesis:

Hypothesis 1: Relative power will be negatively associated with gratitude expression following the receipt of a favor.

Relative power is also likely to influence feelings of gratitude. Indeed, Magee and Smith (2013) propose that

high-power individuals are less likely to experience socially engaging emotions (e.g., gratitude) due to their reduced motivation for affiliation with others. The authors base this claim on an abundance of work showing that high power is associated with less interest in and concern with the mental states of others and in social affiliation more generally (Fiske, 1993; Galinsky et al., 2006; Inesi et al., 2012; Lammers et al., 2012). A complementary view expressed by MacKenzie and Baumeister (2019) holds that feelings of gratitude are driven by an individual's perception that they received a greater benefit than they had a right to expect. As we describe in greater detail below when developing our mediating Hypothesis 4b, higher-power individuals are more likely than lower-power individuals to expect to receive various benefits from others and thus may be less likely to feel grateful following the receipt of any particular benefit. Taken together, we propose that experiencing relatively high compared to low power will reduce the amount of gratitude favor recipients feel.

Hypothesis 2: Relative power will be negatively associated with feelings of gratitude following the receipt of a favor.

In the next section, we propose two mechanisms linking relative power to expressions and feelings of gratitude.

Interpersonal Orientation and Psychological Entitlement as Simultaneous Mediators

Relative power is likely to influence expressions and feelings of gratitude through differences in interpersonal orientation. We focus on interpersonal orientation as a potential mediator given the inherently interpersonal and relational nature of both power (Magee & Smith, 2013; Smith & Magee, 2015) and gratitude (Algoe, 2012). For high interpersonal orientation individuals, "the distribution of power and dependence in the relationship" is particularly relevant (Swap & Rubin, 1983, p. 209). In this way, our conceptualization of interpersonal orientation is closely related to Yang et al.'s (2008) conceptualization of relational orientation which reflects "those tendencies that an individual appreciates in developing, maintaining, and using interpersonal relationships" (p. 714). Our conceptualization of interpersonal orientation is also closely related to Cheung et al.'s (2001) conceptualization of interpersonal relatedness which reflects "a strong orientation toward instrumental relationships; emphasis on occupying one's proper place and engaging in appropriate action; avoidance of internal, external, and interpersonal conflict; and adherence to norms and traditions" (p. 425), characteristics which the authors note "are akin to Singelis's (1994) concept of the interdependent self-construal." Finally, our conceptualization of interpersonal orientation aligns nicely with Hashimoto and Yamagishi's

(2013, p. 143) view of the “interdependent self” as both a “harmony seeker” and a “rejection avoider.” We adapted items from several of these closely related constructs to construct our measure of interpersonal orientation in Study 3.

Importantly, past work suggests that lower-power individuals compared to higher power individuals are more interpersonally oriented. For example, less powerful versus more powerful individuals are more receptive to others’ social needs (Galinsky et al., 2006), more interpersonally attentive (Fiske, 1993; Goodwin et al., 2000), and more compassionate (Van Kleef et al., 2008). Lower-power individuals compared to higher-power individuals also prefer and experience less social distance (Case et al., 2015; Lammers et al., 2012; Magee & Smith, 2013) and have more of an interdependent compared to independent self-construal (Lee & Tiedens, 2001; Magee et al., 2010; Smith & Trope, 2006). Related work stipulates that low-power individuals are more likely to demonstrate a communal orientation than high-power individuals (for reviews see, Keltner et al., 2003; Rucker & Galinsky, 2016; Rucker et al., 2018).

On the basis of this work, we propose that elevated interpersonal orientation among low-power individuals is likely to drive gratitude *expression* because low-power individuals will want to behaviorally signal their interpersonal orientation to the favor giver, thereby advancing the low-power individual’s goal of becoming more closely bound to the favor giver (Algoe, 2012). Furthermore, we propose that elevated interpersonal orientation among low-power individuals is also likely to increase *feelings* of gratitude, which are likely to emerge following the receipt of a favor from a higher power individual. In summary, elevated interpersonal orientation should, in turn, lead to increased expressions and feelings of gratitude following the receipt of a favor. Thus, we predict:

Hypothesis 3a: Lower-power individuals will express more gratitude than higher-power individuals due to experiencing increased interpersonal orientation.

Hypothesis 3b: Lower-power individuals will feel more gratitude than higher-power individuals due to experiencing increased interpersonal orientation.

As previously noted, high power increases a sense of self-focus and decreases attentiveness to and concern for interpersonal relationships (Magee & Smith, 2013). Consistent with this line of reasoning, past work has demonstrated that having various forms of power is associated with an increased sense of entitlement (Campbell et al., 2004; Côté et al., 2020; Piff, 2014; Sawaoka et al., 2015). For example, high-power individuals are more likely than low-power individuals to claim a disproportionate share of resources due to an elevated sense of entitlement (De Cremer & Van Dijk, 2005). Conversely, the inherent vulnerability associated with lacking power is likely to produce a reduced sense of entitlement. In addition, activation of the behavioral approach system (BAS)—which is the neural substrate of high power and

reward-seeking behavior more generally (Keltner et al., 2003)—plays a crucial role in other forms of egocentrism, including narcissism (Miles et al., 2019; Neria et al., 2016), which is directly linked to a sense of entitlement (Raskin & Hall, 1979).

Entitlement may cause favor recipients to feel indifferent toward and/or have difficulty recognizing the contributions that favor givers have made to their own outcomes. As MacKenzie and Baumeister (2019, p., 415) note, “To the extent that one is entitled to some positive outcome, one does not have to be grateful for it.” More specifically, entitled people tend to construe the receipt of a benefit as a reward for their own effort instead of another’s benevolent act (Pelser et al., 2015). Indeed, self-focus is likely to contribute to the view that one is the sole arbiter of one’s outcomes. Simply put, “gratitude is the opposite of entitlement” (Twenge & Campbell, 2009, p. 240).

We propose that elevated psychological entitlement is likely to reduce gratitude *expression* because entitlement prompts a desire to behaviorally signal independence from the favor giver to maintain the illusion that their outcomes were self-made. Furthermore, we propose that elevated psychological entitlement is also likely to decrease *feelings* of gratitude because entitled individuals are unlikely to accurately perceive the contributions of others, which may prevent feelings of gratitude from emerging. Integrating these perspectives, we propose the following:

Hypothesis 4a: Higher-power favor recipients will express less gratitude than lower-power favor recipients due to an increased sense of psychological entitlement.

Hypothesis 4b: Higher-power favor recipients will feel less gratitude than lower-power favor recipients due to an increased sense of psychological entitlement.

The Moderating Role of Relational History

We have argued that lower-power individuals compared to higher-power individuals are more likely to be discerning of different aspects of their relationships with others due to both an elevated interest in affiliating with others and a recognition of their greater exposure to interpersonal threats at the hands of higher-power favor givers.

Building on these ideas, we further propose that when interacting with higher-power favor givers, lower-power favor recipients will be more motivated by a punishment avoidance goal than higher-power favor recipients will be when interacting with lower-power favor givers. We base this prediction on the claim that when determining the appropriate amount of gratitude to express to a higher-power favor giver, overestimating the appropriate amount of gratitude to express is likely to result in less punishment for lower-power favor recipients than underestimating the appropriate amount of gratitude to express. For example, at some point in their relational history with a particular higher-power favor giver,

a lower-power favor recipient may initially conclude that it is interpersonally safe enough to express less gratitude to the higher-power favor giver. However, the lower-power favor recipient may nonetheless conclude (perhaps wisely) that the interpersonal risk associated with upsetting their higher-power interaction partner is too great to justify adjusting their level of gratitude expression downward. That is, they may decide to continue to express a potentially unnecessarily large amount of gratitude to the higher-power favor giver because they recognize that the costs associated with overestimating the appropriate amount of gratitude are relatively trivial compared to the costs associated with underestimating the appropriate amount of gratitude.

This view is consistent with Error Management Theory (Haselton & Buss, 2000) which proposes that the costs associated with committing Type I errors (e.g., expressing gratitude when the favor giver does not expect to receive gratitude) and Type II errors (e.g., not expressing gratitude when the favor giver expects to receive gratitude) are often asymmetrical. Committing a Type II error is particularly costly for lower-power favor recipients who are disproportionately vulnerable to threats from higher-power favor givers (Keltner et al., 2003). In addition, higher-power favor givers may hold normative expectations that they should receive more gratitude from lower-power favor recipients than vice versa. Thus, Type II errors should be more costly to and commonly experienced by lower-power favor recipients compared to higher-power favor recipients.

The consequences of a lower-power favor recipient committing a Type I error, however, are comparatively trivial (e.g., the higher-power favor giver may feel awkwardly flattered). As such, a prudent interpersonal strategy for lower-power favor recipients to adopt when interacting with higher-power favor givers is to err on the side of expressing too much rather than too little gratitude even as the relational history between the two parties deepens. In other words, lower-power favor recipients may be wise to intentionally bias their interpersonal strategy toward committing relatively more Type I gratitude errors than Type II gratitude errors when interacting with higher power favor givers.

However, committing a Type II error is inherently less threatening for low-power favor recipients interacting with similarly low-power favor givers, who do not wield the threat of punishment. In this situation, the costs of expressing too much or too little gratitude are relatively low, and therefore, the low-power favor recipient may determine that it is appropriate to express less gratitude as the relational history between the two low-power actors deepens and individuating information about the favor giver confirms that the favor giver is indeed not a threat (Fiske & Neuberg, 1990).

In summary, we propose that low-power favor recipients will express a high level of gratitude when interacting with higher-power favor givers regardless of the length of their relational history, but will adjust their level of gratitude expression downward over the course of their relationships

with similarly low-power favor givers as incoming individuating information confirms the favor giver is not threatening. High-power favor recipients, on the other hand, will be less discerning of and concerned with the relational histories they have with specific favor givers as a function of those individuals' power level. As a result, the extent to which high-power (vs. low-power) favor recipients adjust their level of gratitude expression downward as their relational histories with others deepen will depend less on the power level of the favor giver because fewer, if any, favor givers will have the authority to punish higher-power favor recipients based on the favor recipients' level of gratitude expression. Overall, this proposed pattern of behavior reflects a three-way interaction:

Hypothesis 5: A three-way interaction among favor recipient power, favor giver power, and relational history will emerge such that as the number of previous interactions with the same favor giver increases, lower-power (vs. higher-power) favor recipients will adjust their level of gratitude expression downward to a greater extent, but only when communicating with similarly low-power favor givers. When interacting with higher-power favor givers, lower-power favor recipients will express a consistently high level of gratitude, regardless of relational history length.

Overview of Studies

Four main studies explore the effects of relative power on expressions and feelings of gratitude. Study 1 examined a unique form of public gratitude expression by analyzing acknowledgements published in academic articles. Study 2 was a pre-registered experiment involving live conversations online in which we assessed expressions and feelings of gratitude. Study 3 was another pre-registered experiment and assessed two potential mediators of the effects of relative power on gratitude expressions and feelings: interpersonal orientation and psychological entitlement. Study 4 assessed relational history as a potential moderator of the effect of relative power on gratitude expression using conversational data from Wikipedia editors. Finally, we report four additional studies, including two that directly manipulate the mediators, in the supplementary online material (SOM) document which provide additional support for our hypotheses (see Figure 1).

Study 1: An Archival Analysis of Professional Power and Gratitude Expression

In Study 1, we tested Hypothesis 1 using a measure of objective power and the amount of gratitude expressed in the acknowledgements section of published academic articles.

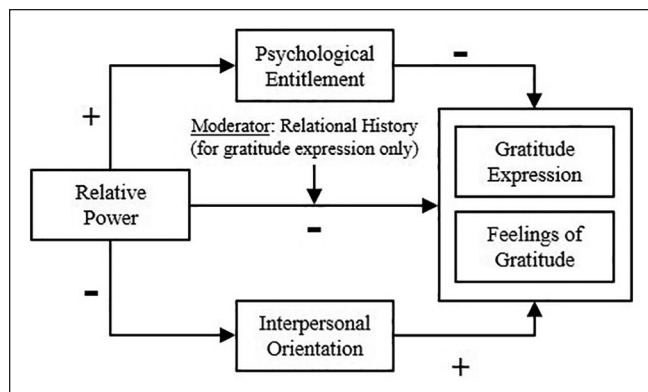


Figure 1. Model of tested relationships.

Method

We acquired records of every article published in the *Academy of Management Review (AMR)*, from the *Business Source Complete* and *Web of Science* databases over 40 years (1976–2015).¹

Sample details. We excluded special contributions (e.g., Dialogues, Replies, Editor’s Notes), articles that had at least one author for whom our power classification did not apply (e.g., authors identified as being from industry, Readers, Lecturers, etc.), and outliers ($n = 6$).² Our final sample consisted of 1,272 articles.

Power measure. We utilized published biographical information to assess the authors’ level of organizational power (coded 1 = Graduate Student, 2 = Postdoctoral Fellow, 3 = Assistant Professor, 4 = Associate Professor, 5 = Full Professor; see Shane & Stuart, 2002). We created three measures of author power. First, we used *first-author power* only. Second, we used *average author power*, calculated by summing the individual author ranks and dividing by the number of authors at the article level. Third, we used a binary measure, *tenured professor* (coded 1 = first author is an Associate Professor or Full Professor, 0 = Otherwise). Past work has treated academic rank as a binary variable in this way (Aldridge et al., 2014; Libaers, 2014). Although we are unable to directly assess *relative power* in this setting, we believe that authors’ professional rank is a useful proxy for relative power (e.g., full professors *predominantly* interact with lower-power others while graduate students *predominantly* interact with higher-power others). This view is consistent with Anicich and Hirsh’s (2017a, p. 659, 2017b; Anicich, 2016) claim that power can be conceptualized “in terms of the stability of one’s vertical orientation” based on the “ratio of upward to downward interactions that one is likely to experience, given the composition of one’s social network” (p. 662).

Gratitude expression. We assessed gratitude expression in three ways. First, two independent coders counted

the number of people and groups thanked in each article. Individuals thanked by name were counted as “people,” whereas collections of individuals (e.g., lab groups, seminar participants, and conference talk attendees, etc.) were counted as “groups.” The first author resolved coding discrepancies (<1% of articles). Second, we constructed a binary variable indicating whether or not the author(s) expressed any gratitude (i.e., thanked at least one person or group; coded 1 = *expressed some gratitude*, 0 = *did not express any gratitude*). Finally, we used the Linguistic Inquiry and Word Count (LIWC; Pennebaker et al., 2015) computerized text-analysis program to assess gratitude expression. LIWC leverages a dictionary of more than 2,300 words and word stems to identify the relative frequency with which particular word categories are used. We created a gratitude dictionary that included the following words: gratef*, grati*, thank*, or appreciat*. The “*” symbol means that all words that start with the same letters are included. For example, thank* includes “thanks,” “thanking,” “thankful,” and so on.

Control variables. We controlled for variables that could conceivably affect our predictor or outcome measures including the *number of authors*, the number of *unique schools* that the author group was affiliated with, *article length* (i.e., number of pages), the *number of citations*,³ the *year of publication*, *author gender*, and the word count of the acknowledgements section (when using the LIWC measure of gratitude as the dependent variable; see Table 1).

Results

All of the results reported below involved fixed-effects models with journal issue as the grouping variable. Negative binomial regressions revealed that author power was negatively associated with the number of people and groups thanked using the first author power measure, $b = -0.13$, $SE = 0.03$, $p < .001$, 95% CI = $[-0.18, -0.08]$, average author power measure, $b = -0.24$, $SE = 0.03$, $p < .001$, 95% CI = $[-0.31, -0.17]$, and first author tenured measure (1 = yes, 0 = no), $b = -0.24$, $SE = 0.06$, $p < .001$, 95% CI = $[-0.35, -0.13]$ (top portion of Table 2). Furthermore, logistic regressions revealed that author power was negatively associated with the likelihood of expressing *any* gratitude using the first author power measure, $b = -0.40$, $SE = 0.08$, $p < .001$, 95% CI = $[-0.56, -0.25]$, the average author power measure, $b = -0.61$, $SE = 0.10$, $p < .001$, 95% CI = $[-0.80, -0.42]$, and the first author tenured measure (1 = yes, 0 = no), $b = -0.66$, $SE = 0.15$, $p < .001$, 95% CI = $[-0.95, -0.36]$ (middle portion of Table 2). Finally, linear regressions revealed that author power was negatively associated with gratitude expression using the LIWC gratitude dictionary using the first author power measure, $b = -0.24$, $SE = 0.06$, $p < .001$, 95% CI = $[-0.36, -0.13]$, the average author power measure, $b = -0.36$, $SE = 0.07$, $p < .001$, 95% CI =

Table 1. Descriptive Statistics for and Correlations Among All Independent, Dependent, and Control Variables (Study 1).

No	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Number of People and Groups Thanked	4.62	5.10													
2	Any Gratitude Expressed (1 = Yes, 0 = No)	0.69	0.46	0.61**												
3	LIWC Measure of Gratitude Expression	2.14	2.07	0.26**	0.69**											
4	First Author Power	3.63	1.05	-0.09**	-0.13**	-0.11**										
5	Average Power	3.68	0.86	-0.09**	-0.15**	-0.12**	0.73**									
6	First Author Tenured (1 = yes, 0 = no)	0.53	0.50	-0.09**	-0.12**	-0.10**	0.82**	0.62**								
7	Number of Authors	1.83	0.81	0.06*	0.05	0.06*	0.02	0.05	0.06*							
8	Unique Schools	1.53	0.72	0.09**	0.05	0.07*	0.10**	0.15**	0.05	0.72**						
9	Article Length	16.07	7.12	0.49**	0.37**	0.23**	-0.02	0.01	0.00	0.19**	0.16**					
10	Number of Citations	87.70	193.13	0.12**	0.11**	0.04	0.00	-0.03	-0.03	0.01	0.00	0.24**				
11	Year of Publication	1992.95	11.67	0.56**	0.41**	0.29**	-0.02	0.06*	-0.02	0.33**	0.33**	0.58**	0.03			
12	Average Author Gender (1 = male, 0 = female)	0.76	0.37	-0.21**	-0.19**	-0.15**	0.12**	0.16**	0.11**	-0.07*	-0.06*	-0.23**	-0.07**	-0.27**		
13	Gender of First Author (1 = male, 0 = female)	0.76	0.43	-0.18**	-0.17**	-0.13**	0.15**	0.12**	0.13**	-0.07*	-0.06*	-0.20**	-0.06*	-0.25**	0.86**	
14	Word Count of Acknowledgment	32.37	29.19	0.78**	0.68**	0.22**	-0.06*	-0.09**	-0.05	0.05	0.06*	0.39**	0.09**	0.45**	-0.17**	-0.14**

Note. N = 1,272. LIWC = Linguistic Inquiry and Word Count.

* $p < .05$. ** $p < .01$.

Table 2. Regression Results From Study 1.

Dependent variable = Number of people and groups thanked						
Fixed-effects negative binomial regression (with journal issue as the grouping variable)						
Variable	Coeff.	SE	Variable	Coeff.	SE	Variable
First Author Power	-0.13***	(0.03)	Average Author Power	-0.24***	(0.03)	First Author Tenured (1 = yes, 0 = no)
Number of Authors	-0.16**	(0.05)	Number of Authors	-0.17**	(0.05)	Number of Authors
Unique Schools	0.02	(0.06)	Unique Schools	0.06	(0.06)	Unique Schools
Article Length	0.05***	(0.01)	Article Length	0.05***	(0.01)	Article Length
Number of Citations	0.00	(0.00)	Number of Citations	0.00	(0.00)	Number of Citations
Author Gender	-0.08	(0.06)	Author Gender	-0.11	(0.08)	Author Gender
Constant	0.08	(0.17)	Constant	0.51**	(0.19)	Constant
Dependent variable = Whether or not any people or groups were thanked (1 = yes, 0 = no)						
Variable	Coeff.	SE	Variable	Coeff.	SE	Variable
Fixed-effects logistic regression (with journal issue as the grouping variable)						
First Author Power	-0.40***	(0.08)	Average Author Power	-0.61***	(0.10)	First Author Tenured (1 = yes, 0 = no)
Number of Authors	-0.32*	(0.14)	Number of Authors	-0.35*	(0.14)	Number of Authors
Unique Schools	-0.19	(0.15)	Unique Schools	-0.13	(0.15)	Unique Schools
Article Length	0.10***	(0.02)	Article Length	0.10***	(0.02)	Article Length
Number of Citations	0.00	(0.00)	Number of Citations	0.00	(0.00)	Number of Citations
Author Gender	-0.29	(0.21)	Author Gender	-0.34	(0.26)	Author Gender
Dependent variable = LIWC measure of gratitude expression						
Fixed-effects linear regression (with journal issue as the grouping variable)						
First Author Power	-0.24***	(0.06)	Average Author Power	-0.36***	(0.07)	First Author Tenured (1 = yes, 0 = no)
Number of Authors	-0.09	(0.10)	Number of Authors	-0.11	(0.11)	Number of Authors
Unique Schools	0.00	(0.12)	Unique Schools	0.05	(0.12)	Unique Schools
Article Length	0.04*	(0.02)	Article Length	0.03*	(0.02)	Article Length
Number of Citations	-0.00	(0.00)	Number of Citations	-0.00	(0.00)	Number of Citations
Author Gender	-0.21	(0.15)	Author Gender	-0.23	(0.17)	Author Gender
Word Count	0.01**	(0.00)	Word Count	0.01**	(0.00)	Word Count
Constant	2.53***	(0.36)	Constant	3.02***	(0.40)	Constant

Note. N = 1,025 in all logit models, N = 1,272 in all other models.

First author gender was used to calculate the author gender control variable when using the first author power measure and average author gender was used to calculate the author gender control variable when using the average author power measure (coded 1 = male, 0 = female). The analyses reveal that across all measures of power, gratitude expression was negatively correlated with author power. SE = standard error; LIWC = Linguistic Inquiry and Word Count.

*p < .05. **p < .01. ***p < .001.

$[-0.50, -0.22]$, and the first author tenured measure (1 = yes, 0 = no), $b = -0.44$, $SE = 0.12$, $p < .001$, 95% CI = $[-0.67, -0.20]$ (bottom portion of Table 2).

Discussion

Lower-power authors compared to higher-power authors expressed more gratitude in the acknowledgements section of published academic articles, supporting Hypothesis 1. A limitation is that lower-power researchers may have received more help from others than higher-power researchers, which could explain this effect. However, this rationale may not hold in academia. First, higher-power scholars are more likely than lower-power scholars to give external talks where they may receive helpful feedback. Second, higher-power scholars have larger networks from which to solicit feedback than lower-power scholars. Third, if a lower-power scholar receives substantial help on a manuscript, it may be expected that the helper be given authorship and hence not be thanked in the acknowledgements. We address this limitation by manipulating power and holding the magnitude and objective helpfulness of the favor constant in Studies 2 and 3.

Study 2: Experimental Evidence of Relative Power's Effect on Expressions and Feelings of Gratitude During a Live Interaction

Study 2 was a pre-registered experiment that tested Hypotheses 1 and 2 (pre-registration: <https://aspredicted.org/blind.php?x=bn4qh7>). Specifically, we manipulated relative power using actual and asymmetric control over an objective resource, held constant the objective helpfulness of the favor, and measured gratitude expression using a behavioral measure and felt gratitude using a paradigm involving a live online chat. We also measured the favor recipient's perception of how costly the favor was for the favor giver and how valuable the favor recipient perceived the favor to be and predicted that no differences would emerge between the two conditions on these measures because we intentionally held the objective cost/value of the favor constant across conditions. We note, however, that we only pre-registered our null hypothesis related to favor cost. Additional robustness checks and exploratory analyses are available in the SOM document.

Method

Participants. Two hundred and eighty-three Mechanical Turk workers participated in exchange for US\$0.40. We oversampled to acquire at least 240 responses after applying our exclusion criteria (for similar approaches, see Anicich et al., 2020; Gan et al., 2018), which an a priori power analysis revealed was the necessary sample size to detect an effect

with 80% power (two-tailed, $\alpha = .05$) based on the results of Study S1 reported in the SOM document. As specified in our pre-registration document, we excluded participants who failed an attention check ($N = 14$) and who expressed suspicion about their chat partner ($N = 8$), resulting in a final sample of 261 ($M_{\text{age}} = 37.74$ years, $SD_{\text{age}} = 11.33$, 59% female).

Relative power manipulation. We told participants to imagine working in an organization with employees distributed across the country. We further told participants that they may have the opportunity to interact with the other participant who was also ostensibly participating in the study. In reality, one of the current authors served as the confederate during the chat and followed a standardized script (described below).

We informed participants that they would have a chance to be entered into a virtual lottery for a US\$25 Amazon gift card that would be paid out after all data were collected and that their chance of winning would be based on their number of lottery tickets.

We manipulated relative power by randomly assigning participants to either a *lower-power condition* (i.e., subordinate role) or a *higher-power condition* (i.e., boss role; see Waytz et al., 2015). Specifically, participants read,

The Boss gets to make the decision of how to divide up the 10 lottery tickets any way he/she likes. The Boss can keep all the lottery tickets for himself/herself, can split the lottery tickets equally, or give more or less to the other person. The Boss will keep the lottery tickets he/she allocates to himself/herself. The Subordinate does not get to make any decision. He/she simply receives the number of lottery tickets allocated by the Boss.

On the subsequent screen, participants in the *lower-power* [*higher-power*] condition read,

You have been assigned to the role of SUBORDINATE [BOSS]. As the subordinate [boss], you have far less [more] power than your boss [subordinate] who is also participating in this study. At the end of the study, your boss [you] will decide how many of the 10 lottery tickets to allocate to themselves and you [yourself and your subordinate].

Next, we told participants in both conditions that they would now complete several tasks as part of the organizational simulation. Then, *lower-power* [*higher-power*] participants read the following task description adapted from Schmeichel (2007):

First, imagine that the organization you work for highly values attention to detail and creativity. To demonstrate your attention to detail and creativity, please write two pages about your day yesterday or as much as you are able to write in 5 minutes. However, there is an important rule—You may not use words containing the letters "A" or "N." During this task, your boss [subordinate] will be given the option to chat with you. Your boss [subordinate] may or may not choose to initiate a chat.

Participants then saw two blank text entry boxes next to a timer with a reminder to write for at least 5 minutes. After 14 seconds, however, the screen automatically advanced and revealed a mail icon with the note: “Your boss [subordinate] has requested the opportunity to chat with you.” Then, a ChatPlat window appeared (e.g., see Brown et al., 2020; Huang et al., 2017) and participants read that they were now connected with their boss [subordinate]. Participants had 2 min to chat.

As we described in our pre-registration document, one of the authors played the role of a confederate (either the boss or subordinate role) and sent only two messages to participants:

Statement #1: “Hi there”

Statement #2 (after a brief pause): “I read about the writing task you have to complete. As your subordinate [boss], I am willing to complete the task for you . . . so just click to the next screen when you’re ready. I’ve already accepted the task on my end. ok?”

Gratitude expression. We measured gratitude expression based on whether the participant (i.e., the favor recipient) expressed any gratitude to the ostensibly higher-power or lower-power confederate (i.e., favor giver) by using any LIWC gratitude dictionary word from Study 1. We also assessed gratitude expression as a continuous variable using the LIWC gratitude dictionary.

Felt gratitude. After the chat, participants completed a 3-item measure of felt gratitude adapted from MacKenzie and Baumeister (2019; e.g., “I feel extremely appreciative for the favor”; $\alpha = .98$).

Perceived cost to the favor giver. Four items ($\alpha = .88$) adapted from MacKenzie and Baumeister (2019) assessed how costly participants perceived the favor to be for their boss [subordinate] (e.g., “It cost this person a great deal of effort to do this favor for me”; 1 = “agree a little” to 9 = “very strongly agree”).

Perceived favor value. Five items ($\alpha = .97$) adapted from MacKenzie and Baumeister (2019) assessed how valuable the favor recipient perceived the favor to be (e.g., “I consider this to be a very big favor”; 1 = “agree a little” to 9 = “very strongly agree”).

Manipulation check. To determine whether our manipulation was effective, participants responded to three 7-point response scales ($\alpha = .95$) with the following response anchors: “I felt less [more] powerful than the other person,” “I had less [more] control than the other person,” and “I felt weaker [stronger] than the other person.”

Afterwards, participants were fully debriefed and assigned an equal chance of winning the US\$25 lottery, which we paid out at the conclusion of the study.

Results

Our manipulation was effective. Lower-power participants ($M = 2.46$, $SD = 1.37$) reported having less power relative to their interaction partner than higher-power participants ($M = 4.83$, $SD = 1.52$), $t(259) = 13.20$, $p < .001$, $d = 1.63$.

Supporting Hypothesis 1, 40% of lower-power and 26% of higher-power favor recipients expressed gratitude, $\chi^2(1, N = 261) = 6.01$, $p = .014$. In addition, lower-power favor recipients ($M = 7.55$, $SD = 11.24$) expressed significantly more gratitude than higher-power favor recipients using the LIWC dictionary measure ($M = 3.98$, $SD = 8.36$), $t(259) = 2.91$, $p = .004$, $d = 0.36$. Supporting Hypothesis 2, lower-power favor recipients ($M = 7.04$, $SD = 2.13$) reported feeling more gratitude than higher-power favor recipients ($M = 6.06$, $SD = 2.66$), $t(259) = 3.29$, $p = .001$, $d = 0.41$.

Finally, our predictions that participants in the two conditions would report no differences in the perceived cost of the favor to the favor giver and perceived value of the favor to the favor recipient were not supported. Participants in the lower-power favor recipient condition ($M = 5.58$, $SD = 2.23$) reported perceiving the favor as more costly to the favor giver than participants in the higher-power favor recipient condition ($M = 4.72$, $SD = 2.19$), $t(259) = 3.17$, $p = .002$, $d = 0.39$. We also found that participants in the lower-power favor recipient condition ($M = 6.70$, $SD = 2.19$) reported perceiving the favor as more valuable than participants in the higher-power favor recipient condition ($M = 5.90$, $SD = 2.39$), $t(259) = 2.83$, $p = .005$, $d = 0.35$. One explanation that may account for these unexpected findings is that individuals may, on average, believe that higher-power favor givers’ time is more valuable than lower-power favor givers’ time. To the extent this is a widely held belief, when higher-power compared to lower-power individuals perform a favor, the favor recipient may perceive that favor to be both more costly to the favor giver and more valuable to the self.

Since relative power was significantly associated with the perceived cost of the favor for the favor giver and the perceived value of the favor to the self, we re-ran our analyses while controlling for these variables. Relative power remained significantly and negatively associated with any gratitude expression, logistic regression: $b = -0.55$, $SE = 0.27$, $p = .043$, and was marginally significantly and negatively associated with felt gratitude, linear regression: $b = -0.28$, $SE = 0.16$, $p = .083$.

Discussion

Study 2 provided support for Hypotheses 1 and 2 that power reduces expressions and feelings of gratitude in an

objectively helpful favor situation. These effects remained significant or marginally significant when controlling for the perceived favor cost and value.

Study 3: Experimental Evidence of Mediation Through Interpersonal Orientation and Psychological Entitlement

Study 3 was another pre-registered experiment in which participants indicated how much gratitude they would express and feel after receiving a favor in an organizational scenario (pre-registration: <https://aspredicted.org/blind.php?x=p6y527>). We randomly assigned participants to one of three relative power conditions (i.e., lower, same, or higher) and measured our proposed mediators—interpersonal orientation and psychological entitlement. Thus, Study 3 tested Hypotheses 1–4b.

Method

Participants. Three-hundred and fifty-six Mechanical Turk workers participated in exchange for US\$0.40. We oversampled to acquire at least 339 responses after applying our exclusion criteria, which an a priori power analysis revealed was the necessary sample size to detect a small to medium effect (i.e., Cohen's $f = 0.17$, $\alpha = .05$) based on the results of Study S2 reported in the SOM document. We excluded six participants who failed an attention check, resulting in a final sample of 350 ($M_{\text{age}} = 38.44$ years, $SD_{\text{age}} = 12.81$ years; 57% female).

Power manipulation. Participants read one of three organizational scenarios (adapted from Blader & Chen, 2012; Mooijman et al., 2020). Participants in the relatively higher-power [lower-power] condition read,

Imagine that you are an employee in a medium-sized firm. Further, imagine having hierarchical relationships with others in your organization. This means that you hold more [less] power than other employees and you control many more [fewer] resources compared to other employees in the organization. Indeed, you are one of the most [least] powerful individuals in the organization. Other employees report directly to you [You directly report to other employees].

Participants in the same-power condition read,

Imagine that you are an employee in a medium-sized firm. Further, imagine having non-hierarchical relationships with others in your organization. This means that you hold the same amount of power as other employees and you control an equal amount of resources compared to other employees in the organization. Indeed, you are neither more nor less powerful

than most individuals in the organization. Neither you nor the other employees directly report to each other.

We did not specify the participant's absolute level of power in the same-power condition to ensure our manipulation did not simultaneously manipulate relative and absolute power, which would have introduced a confound.

Interpersonal orientation (mediator). We assessed interpersonal orientation using six items ($\alpha = .79$, 1 = "strongly disagree" to 7 = "strongly agree"), adapted from three related measures. Our measure included two items from the IO Scale (Swap & Rubin, 1983): "I would be greatly influenced by the moods of others in the organization" and "I would be very sensitive to criticism from others in the organization," two items from Hashimoto and Yamagishi's (2013) measure of interdependence: "I would find myself being concerned about what others in the organization think of me" and "I would think it is important not to disturb good relations with others in the organization," and two items from the Interdependent Self-Construal Scale (Singelis, 1994): "Even if I strongly disagreed with others in the organization, I would avoid an argument," and "I would feel that my fate is intertwined with the fate of others in the organization."

Psychological entitlement (mediator). Four items ($\alpha = .91$) measured psychological entitlement (adapted from Campbell et al., 2004): "I would honestly feel I'm just more deserving than others in the organization," "I would feel entitled to better outcomes than others in the organization," "Things should go my way more than they should go the way of others in the organization," and "I would deserve more things in my life than others in the organization" (1 = "strongly disagree" to 7 = "strongly agree"). We counterbalanced the order of the interpersonal orientation and psychological entitlement measures.

Gratitude expression. Next, participants read, "Now imagine that you received the following email from your subordinate [coworker] [boss], Sam." The email read,

Hi [participant's first name inserted here],

Following up on our conversation from the other day, I wanted to share this article I came across. As you can see, it's highly relevant to what we were discussing.

Best,

Sam

Participants then read, "It turns out that you had recently heard about this article and were looking forward to reading it, but had trouble finding it online," which we included to indicate the favor was actually helpful. Finally, participants

Table 3. Regression Results Pertaining to Mediation for Study 3.

Variable	DV = Interpersonal orientation		DV = Psychological entitlement		DV = Expressed gratitude		DV = Expressed gratitude		DV = Felt gratitude		DV = Felt gratitude	
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coeff.	SE	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	
Power (−1 = LP, 0 = SP, 1 = HP)	−0.28***	(0.06)	0.29**	(0.09)	−0.17***	(0.04)	−0.13**	(0.04)	−0.12	(0.12)	0.02	(0.12)
Interpersonal Orientation							0.07*	(0.04)			0.39***	(0.10)
Psychological Entitlement							−0.05*	(0.03)			−0.14 ⁺	(0.07)

Note. $N = 350$ in all models. SE = standard error.

* $p < .05$. ** $p < .01$. *** $p < .001$. ⁺ $p = .06$.

selected one of the following ordinal responses to send to Sam: (1) “[no response],” (2) “Interesting, I’ll have a look,” (3) “Interesting, I’ll have a look. Thanks,” and (4) “Interesting, I’ll have a look. Thanks so much for sending this!”

Felt gratitude. We measured felt gratitude with the same three items from the previous study, but worded as hypothetical statements (e.g., “I would feel extremely appreciative for the favor”; $\alpha = .93$).

Manipulation check. Participants responded to the same 3-item measure we used in the previous study ($\alpha = .96$).

Results

Our manipulation was successful. Higher-power participants ($M = 5.16$, $SD = 1.15$) reported having more power than same-power participants ($M = 4.04$, $SD = 0.62$), $t(231) = 9.28$, $p < .001$, $d = 1.21$, who reported having more power than lower-power participants ($M = 2.77$, $SD = 1.40$), $t(232) = 8.92$, $p < .001$, $d = 1.17$.

Expressed gratitude. To test Hypothesis 1, we conducted Mann–Whitney U -tests, which is appropriate when comparing differences between two independent groups when the dependent variable is ordinal, but not normally distributed. Higher-power favor recipients ($M = 3.30$, $Mdn = 3.0$, $SD = 0.69$) expressed significantly less gratitude than lower-power favor recipients ($M = 3.64$, $Mdn = 4.0$, $SD = 0.52$), $U = 4,955.5$, $z = 4.04$, $p < .001$, and same-power favor recipients ($M = 3.45$, $Mdn = 4.0$, $SD = 0.74$), $U = 5,785.0$, $z = 2.18$, $p = .029$). Same-power favor recipients expressed marginally less gratitude than lower-power favor recipients, $U = 6,049.5$, $z = 1.80$, $p = .073$).

Felt gratitude. To test Hypothesis 2, we conducted independent-samples t -tests. Higher-power favor recipients ($M = 5.84$, $SD = 1.94$) did not feel significantly less grateful than either lower-power favor recipients ($M = 6.09$, $SD =$

1.92), $t(231) = 0.99$, $p = .33$, $d = 0.13$, or same-power favor recipients ($M = 6.17$, $SD = 1.54$), $t(231) = 1.46$, $p = .15$, $d = 0.19$. Same-power and lower-power favor recipients did not differ in their levels of felt gratitude, $t(232) = 0.38$, $p = .71$, $d = 0.05$. Thus, we did not find support for Hypothesis 2.

Interpersonal orientation. As predicted, lower-power favor recipients ($M = 5.00$, $SD = 1.10$) reported greater interpersonal orientation than higher-power favor recipients ($M = 4.45$, $SD = 0.95$), $t(231) = 4.10$, $p < .001$, $d = 0.54$. Lower-power favor recipients also reported greater interpersonal orientation than same same-power favor recipients, $t(232) = 3.54$, $p < .001$, $d = 0.46$. Unexpectedly, however, higher-power favor recipients and same-power favor recipients ($M = 4.53$, $SD = 0.91$) did not differ in their reported level of IO, $t(231) = 0.70$, $p = .49$, $d = 0.09$.

Psychological entitlement. As predicted, higher-power favor recipients ($M = 3.42$, $SD = 1.39$) reported more psychological entitlement than lower-power favor recipients ($M = 2.85$, $SD = 1.24$), $t(231) = 3.33$, $p = .001$, $d = 0.44$, and same-power favor recipients ($M = 2.81$, $SD = 1.32$), $t(231) = 3.47$, $p = .001$, $d = 0.45$. Same-power and lower-power favor recipients did not differ in psychological entitlement, $t(232) = 0.24$, $p = .81$, $d = 0.03$.

Mediation analysis. As outlined in our pre-registration document, we coded relative power as a continuous variable (coded $-1 =$ lower-power condition, $0 =$ same-power condition, $1 =$ higher-power condition) and tested our mediation hypotheses. A bootstrapping procedure with 5,000 resamples (Hayes, 2013) indicated that interpersonal orientation (95% CI = $[-0.047, -0.001]$) and psychological entitlement (95% CI = $[-0.038, -0.001]$) simultaneously and partially mediated the effect of relative power on gratitude expression, supporting Hypotheses 3a and 4a.

When felt gratitude was the outcome, we conducted indirect-only mediation (see Zhao et al., 2010) because the direct

effect of relative power on felt gratitude (i.e., the *c* path) was not significant. A bootstrapping procedure with 5,000 resamples indicated that interpersonal orientation significantly and fully mediated the effect of relative power on felt gratitude (95% CI = [-0.206, -0.033]), but psychological entitlement did not function as a significant mediator (95% CI = [-0.103, 0.005]), providing support for Hypothesis 4b, but not Hypothesis 4a (see Table 3).

To provide greater confidence in our proposed mechanisms, we report two additional experiments involving an objectively helpful favor in the SOM document. Following the experimental-causal-chain approach (Spencer et al., 2005), we find that participants in a high (vs. low) interpersonal orientation condition expressed and felt more gratitude (Supplemental Study S3a). In addition, participants in a high (vs. low) psychological entitlement condition expressed and felt less gratitude (Supplemental Study S3b). These results provide additional evidence that relative power influences feelings and expressions of gratitude through differences in interpersonal orientation and psychological entitlement.

Discussion

Study 3 provided additional evidence that lower-power (compared to higher-power) favor recipients express more gratitude. However, unlike the results of Study 2, relative power was not significantly associated with feelings of gratitude. Furthermore, we demonstrated that the effect of relative power on gratitude expression was simultaneously mediated by lower-power individuals experiencing increased interpersonal orientation compared to higher-power individuals and higher-power individuals experiencing increased psychological entitlement compared to lower-power individuals. With respect to feelings of gratitude, only IO, but not psychological entitlement, significantly mediated the effect.

Study 4: Conversational Exchanges Among Wikipedia Editors

In Study 4, we leveraged a rich, archival dataset of conversational exchanges among Wikipedia editors ($N = 136,215$). Because the dataset includes information about the power of the favor recipient *and* favor giver, we were able to assess the effect of relative power on gratitude expression (Hypothesis 1). Furthermore, given the panel structure of our dataset, we were able to test the three-way interaction among favor recipient power, favor giver power, and relational history (Hypothesis 5).

Method

We acquired detailed conversational records from Wikipedia editors.⁴ The final sample included 136,215 observations (12,681 unique speakers) from 2003 to 2011. Each observation is a comment submitted by one editor to another editor.

These conversations occurred on talk pages, which are forums where Wikipedia editors discuss improvements to articles. Additional study details are provided in the SOM document.

Favor recipient power. Favor recipient power was a dummy variable that distinguishes between the two types of Wikipedia editors—administrators (or “admins”) and non-admin editors. Admin editors have more formal power than non-admin editors because admins have unique access to “restricted technical features such as protecting or deleting pages or blocking other editors” (Danescu-Niculescu-Mizil et al., 2012, p. 701), responsibilities which are consistent with our definition of power (Magee & Galinsky, 2008).

Relational history (moderator). We operationalized relational history as the number of comments the favor recipient had previously sent to a particular favor giver.

Gratitude expression. We assessed gratitude expression using the LIWC gratitude dictionary from Studies 1 and 2 (i.e., gratef*, grati*, thank*, or appreciat*). In the SOM document, we also report consistent results when using whether or not speakers expressed gratitude as a binary measure (coded 1 = expressed gratitude, 0 = did not express any gratitude).

Control variables. We controlled for speaker gender (coded 0 = female, 1 = male, and 2 = unknown), recipient gender (0 = female, coded 1 = male, and 2 = unknown), speaker edit count (i.e., logged number of speaker’s previous Wikipedia edits), recipient edit count (i.e., logged number of recipient’s previous Wikipedia edits), comment word count, and preceding comment word count (i.e., of the comment to which the current speaker is responding). We included fixed effects to control for the comment *year* (see Table 4).

Results

We ran mixed effects regressions with favor recipient ID as the grouping variable to account for the fact that comments were nested within speakers ($N = 12,681$ favor recipients and 136,215 comments).

The interaction between favor recipient power and favor giver power on gratitude expression was significant, $b = -0.55$, $SE = 0.12$, $p < .001$, 95% CI = [-0.79, -0.31] (Model 1, Table 5). Specifically, high-power favor recipients expressed less gratitude to low-power favor givers ($M = 1.52$, $SE = 0.04$) than to high-power favor givers ($M = 2.22$, $SE = 0.08$), $t(42, 371) = -8.09$, $p < .001$, $d = 0.08$. In addition, low-power favor recipients expressed more gratitude to high-power favor givers ($M = 3.26$, $SE = 0.07$) than to low-power favor givers ($M = 2.05$, $SE = 0.04$), $t(93, 870) = -16.84$, $p < .001$, $d = 0.11$ (see Figure 2).

Table 4. Descriptive Statistics and Correlations Among All Variables Used in Study 4.

No.	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	Gratitude Expression (LIWC measure #1)	2.19	9.48											
2	Gratitude Expression (LIWC measure #2)	2.38	9.50	0.990**										
3	Favor Recipient Power (i.e., Admin = 1, Non-Admin Editor = 0)	0.31	0.46	-0.032**	-0.032**									
4	Favor Giver Power (i.e., Admin = 1, Non-Admin Editor = 0)	0.29	0.46	0.049**	0.049**	0.024**								
5	Favor Recipient Edit Count (logged)	9.55	2.06	-0.014**	-0.015**	0.260**	-0.031**							
6	Favor Giver Edit Count (logged)	9.46	2.19	0.028**	0.026**	-0.015**	0.257**	0.013**						
7	Favor Recipient Gender (1 = male, 2 = female, 3 = unknown)	2.39	0.91	0.002	0.003	-0.036**	0.022**	-0.169**	-0.029**					
8	Favor Giver Gender (1 = male, 2 = female, 3 = unknown)	2.36	0.92	-0.015**	-0.013**	0.010**	-0.064**	-0.037**	-0.193**	0.052**				
9	Word Count of Current Comment	47.38	51.04	-0.168**	-0.171**	-0.019**	-0.028**	-0.003	-0.013**	0.001	0.012**			
10	Word Count of Preceding Comment	29.66	14.67	-0.081**	-0.081**	-0.025**	-0.007*	-0.011**	0.017**	0.004	0.001	0.169**		
11	Year	2008.91	1.83	0.014**	0.012**	-0.059**	-0.139**	0.129**	0.112**	-0.203**	-0.205**	0.024**	0.011**	
12	Relational History (i.e., no. of previous interactions)	2.95	11.72	-0.023**	-0.025**	0.050**	0.002	0.074**	0.081**	0.027**	0.036**	-0.017**	-0.017**	-0.022**

Note. N = 136,215. LIWC = Linguistic Inquiry and Word Count.

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

Table 5. Regression Results for Study 4.

Variable	DV = Amount of gratitude expressed (LIWC scores)				DV = Any gratitude expressed (LIWC scores, 1 = Yes, 0 = No)			
	Model 1		Model 2		Model 3		Model 4	
	Coeff.	SE	Coeff	SE	Coeff	SE	Coeff	SE
Favor Recipient Power (i.e., Admin = 1, Non-Admin Editor = 0)	-0.594***	(0.125)	-0.612***	(0.126)	-0.324***	(0.031)	-0.322***	(0.032)
Favor Giver Power (i.e., Admin = 1, Non-Admin Editor = 0)	1.116***	(0.073)	1.072***	(0.075)	0.387***	(0.020)	0.359***	(0.021)
Favor Recipient Edit Count (i.e., logged)	-0.064*	(0.030)	-0.063*	(0.030)	-0.047***	(0.006)	-0.045***	(0.006)
Favor Giver Edit Count (i.e., logged)	0.048***	(0.012)	0.054***	(0.012)	0.012**	(0.004)	0.016***	(0.004)
Favor Recipient Gender (ref. female)								
Male	-0.359	(0.546)	-0.363	(0.546)	-0.260*	(0.104)	-0.270**	(0.104)
Unknown	-0.417	(0.537)	-0.412	(0.537)	-0.299**	(0.102)	-0.305**	(0.102)
Favor Giver Gender (ref. female)								
Male	0.204	(0.166)	0.192	(0.166)	0.029	(0.048)	0.019	(0.048)
Unknown	0.155	(0.163)	0.157	(0.163)	0.035	(0.047)	0.030	(0.047)
Word Count Current Comment	-0.029***	(0.001)	-0.029***	(0.001)	-0.003***	(0.000)	-0.003***	(0.000)
Word Count of Preceding Comment	-0.037***	(0.002)	-0.037***	(0.002)	-0.004***	(0.001)	-0.004***	(0.001)
Favor Recipient Power × Favor Giver Power	-0.551***	(0.120)	-0.489***	(0.126)	-0.087*	(0.035)	-0.043	(0.037)
Familiarity with Favor Giver (i.e., # of previous interactions)			-0.031***	(0.006)			-0.028***	(0.002)
Favor Recipient Power × Length of Conversational History			0.021***	(0.006)			0.013***	(0.003)
Favor Giver Power × Length of Conversational History			0.022**	(0.008)			0.019***	(0.003)
Favor Recipient Power × Favor Giver Power × Length of Conversational History			-0.035*	(0.015)			-0.030***	(0.006)
Year Fixed Effects	Yes		Yes		Yes		Yes	
Constant	4.776***	(1.240)	4.733***	(1.240)	-1.079**	(0.335)	-1.109**	(0.340)
Number of Comments	136,215		136,215		136,215		136,215	
Number of Unique Speakers	12,681		12,681		12,681		12,681	

Note. Models 1 and 2 are linear mixed effects regressions (using the xtreg command in Stata) and Models 3 and 4 (using the glmer command in R). All models included favor recipient ID as the grouping variable. LIWC = Linguistic Inquiry and Word Count; SE = standard error.
* $p < .05$. ** $p < .01$. *** $p < .001$.

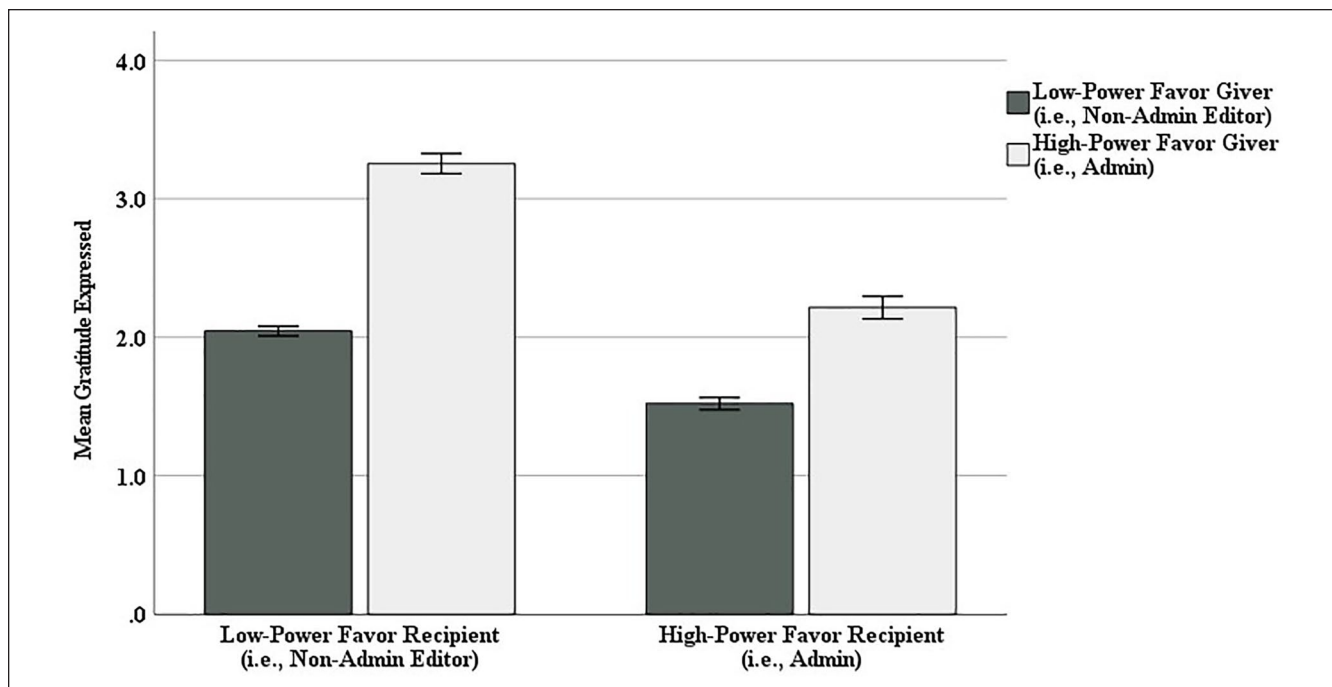


Figure 2. Gratitude expression in Study 4. Error bars represent ± 1 Standard Error.

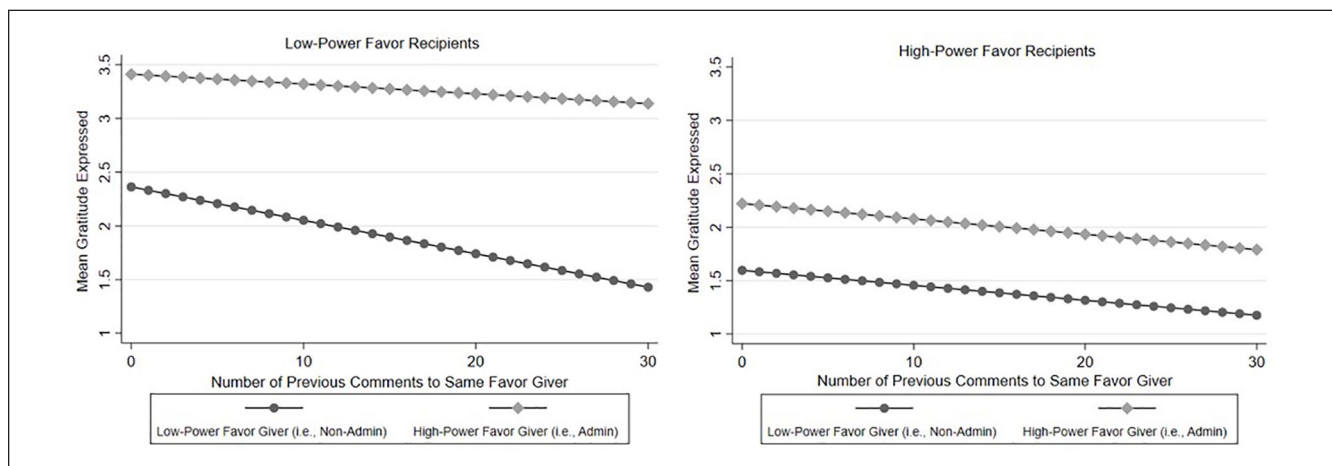


Figure 3. Interaction between favor giver power and length of relational history by favor recipient power level in Study 4.

Next, we tested whether relational history moderated the effect of relative power on gratitude expression. As predicted, a three-way interaction among favor recipient power, favor giver power, and relational history on gratitude expression emerged, $b = -0.04$, $SE = 0.02$, $p = .02$, $95\% \text{ CI} = [-0.066, -0.005]$ (Model 2, Table 5). Specifically, when the favor recipient had low power, the two-way interaction between favor giver power and relational history was significant, $b = 0.022$, $SE = 0.008$, $p = .006$, $95\% \text{ CI} = [0.006, 0.038]$ (left panel of Figure 3). However, when the favor recipient had high power, the two-way interaction between

favor giver power and relational history was not significant, $b = -0.0003$, $SE = 0.0117$, $p = .98$, $95\% \text{ CI} = [-0.023, 0.023]$ (right panel of Figure 3).

This pattern of results demonstrates that as relational history increased, low-power (vs. high-power) favor recipients adjusted their level of gratitude expression downward, but only when communicating with similarly low-power favor givers. When interacting with higher-power favor givers, lower-power favor recipients expressed a consistently high level of gratitude, regardless of relational history length.

Discussion

Study 4 used a large archival dataset of actual conversational exchanges and demonstrated that relational history moderated the effect of relative power on gratitude expression. As in Study 1, one limitation is that lower-power non-admin editors may have received more help from higher-power admins, which could explain this effect. Although we are unable to rule out this alternative explanation, it is worth noting that admins and non-admin editors closely collaborate to edit Wikipedia content. Therefore, giving and receiving help is crucial to the successful maintenance of Wikipedia as a communal resource (e.g., see quotes in SOM Table S4 depicting the collaboration process). In addition, the experimental results we report in Studies 2 and 3 address this concern.

General Discussion

Power and gratitude are universal features of social life. We reported four main studies and four supplementary studies that established a negative relationship between relative power and expressing and feeling gratitude. Furthermore, we identified two mechanisms linking relative power to gratitude—interpersonal orientation and psychological entitlement. Finally, we found that as the relational history with the same favor giver deepened, low-power (vs. high-power) favor recipients adjusted their level of gratitude expression downward, but only when communicating with similarly low-power favor givers. When interacting with higher-power favor givers, lower-power favor recipients expressed a consistently high level of gratitude, regardless of relational history length.

Theoretical Contributions and Practical Implications

This research contributes to the power, gratitude, and impression formation literatures. First, we identify a crucial antecedent of expressing and feeling gratitude—relative power. Whereas past work has focused on downstream consequences of gratitude, we empirically document power's role in shaping gratitude feelings and expressions. Second, we identify interpersonal orientation and psychological entitlement as mechanisms driving these effects, thereby drawing on and integrating insights from the social distance theory of power (Magee & Smith, 2013) and the find-remind-and-bind theory of gratitude (Algoe, 2012). Third, our findings advance the perspective that power, by its very nature, is interpersonal (e.g., see Smith & Magee, 2015). Finally, we tested a novel hypothesis related to the relational history between interaction partners by leveraging insights from error management theory (Haselton & Buss, 2000). Our findings suggest that the asymmetrical costs associated with committing Type I and Type II errors may lead lower-power

favor recipients to express an especially large amount of gratitude to higher-power favor givers as a way to satisfy the punishment avoidance motive.

Our findings also have important practical implications. Expressing gratitude is a virtually costless act that has many positive effects (Bartlett & DeSteno, 2006; Cheng et al., 2015; Grant & Gino, 2010; Kaplan et al., 2014; Waters, 2012). Thus, understanding the factors that affect gratitude expression is crucially important to unleash gratitude's potential. Our findings suggest that gratitude interventions may be most usefully implemented among powerful individuals. For example, employee appreciation initiatives may lead organizational leaders to actively reflect on the ways in which their employees have benefited them, which may decrease their entitlement and increase their relational concern, potentially resulting in more gratitude expression.

Furthermore, leadership development programs and organizational onboarding procedures should be used to educate employees about the benefits of feeling and expressing gratitude. Given that power has been linked to self-serving behavior (Williams, 2014), leaders may be more receptive to gratitude interventions that are tailored to reveal the benefits leaders will receive from feeling and expressing gratitude.

Limitations

This work also has several limitations. First, we are unable to rule out alternative explanations for the findings reported in Studies 1 and 4. It is possible that low-power researchers (e.g., grad students) and Wikipedia editors (i.e., non-admin editors) may have simply received more help from others than high-power researchers (e.g., full professors) and Wikipedia editors (i.e., admins), which could explain their increased gratitude expression relative to higher-power others. Alternatively, low-power researchers and Wikipedia editors may have expressed more gratitude to specific others as a way of signaling their high-status network ties to a broader audience. We address this limitation in Studies 2 and 3 by holding constant the magnitude of the favor received.

Second, Study 3 relies on a single item measure of gratitude expression. We chose the single item measure because we believe the pre-set response options that we included accurately reflect the types of comments that individuals are likely to use. In addition, participants may have found it difficult to report how much gratitude they wanted to express using a multi-item scale. We also note that Robins et al. (2001) found that a single-item measure can have high convergent validity with the full-item scale. Although we find consistent evidence across our set of studies, we acknowledge that a more involving experiment relying on a behavioral measure of gratitude (such as the gratitude measure used in Study 2) could shed further light on the phenomenon of interest.

Future Directions

Researchers should seek to understand when higher-power favor recipients are unaware of their reduced gratitude expression versus when higher-power favor recipients strategically withhold gratitude. Both situations result in reduced gratitude expression, but for very different reasons. Those who are unaware of their reduced gratitude expression may be upset to learn that they have not been meeting the social needs of others, whereas those who withhold gratitude strategically may be acutely aware of the harm caused by their reduced gratitude expression, but embrace that outcome as a means to an end. In addition, scholars should continue to study the perception that higher-power individuals have of others' generous acts and how these perceptions may affect the relationship between the two parties. Some scholars have made initial strides in this area (Inesi et al., 2012; Kunstman et al., 2018), but additional research is warranted. Finally, follow-up work could test our hypotheses in a cross-cultural context. For example, higher-power favor recipients in collectivist cultures compared to individualistic cultures may be more cognizant of others' needs in general and the value of expressing gratitude in particular, thus leading them to express as much or even more gratitude than lower-power favor recipients.

Conclusion

Taken together, our findings identify a crucial predictor of feeling and expressing gratitude—relative power—and highlight when and why the relationship between relative power and gratitude emerges. As psychologists and practitioners alike continue to seek ways to understand and improve communication patterns, they would be wise to emphasize and study gratitude and the forces that affect its emergence and expression.

Acknowledgments

We are extremely grateful for the constructive feedback that the associate editor and two anonymous reviewers provided to us throughout the peer review process. In addition, we thank Adam Galinsky for providing incredibly insightful feedback on multiple versions of this paper.


Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Notes

1. Data, code, and materials for all studies are available on the Open Science Framework: https://osf.io/6x9wz/?view_only=971dd6b8c2a544b49bf1acad687ce26e
2. See the SOM document for outlier detection information.
3. All citation data were collected from the *Business Source Complete* database on January 15, 2016.
4. The data are available on Cristian Danescu-Niculescu-Mizil's website: http://www.cs.cornell.edu/~cristian/Echoes_of_power.html. We thank Cristian Danescu-Niculescu-Mizil and his colleagues for making these data publicly available.

Supplemental Material

Supplemental material is available online with this article.

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