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A control-based account of stereotyping☆

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ABSTRACT

Drawing from *compensatory control theory,* we propose that because stereotypes provide psychological assurance that the world is orderly and predictable, stereotyping should increase among those lacking control. Four studies support this control-based account of stereotyping: lower personal control, both measured (Studies 1 and 3) and manipulated (Study 2a and 2b), was associated with greater gender (Studies 1, 2a, and 2b) and occupational stereotyping (Study 3). Furthermore, the association between control and stereotyping was mediated by need for structure (Studies 2a, 2b, and 3). We also explore the moderating role of interdependent self-construal (Studies 1 to 3). These findings have implications for our understanding of when, why and to what end people stereotype others.

Decades of social cognition research converge on the notion that stereotypes are useful because they lend coherence and order to our complex and chaotic social world (Allport, 1954). Despite their usefulness, social stereotypes – overgeneralized and widely accepted beliefs about members of a group (Snyder, Tanke, & Berscheid, 1977) – are also linked to important negative interpersonal and societal phenomenon such as prejudice, discrimination, and intergroup bias (e.g., Dovidio, Brigham, Johnson, & Gaertner, 1995; Hewstone, Rubin, & Willis, 2002; Jost & Banaji, 1994). Given these wide-ranging interpersonal and societal consequences, it is unsurprising that a large body of work has been devoted to understanding the causes and consequences of stereotyping. Despite this focus, there is a lack of understanding of how exactly the need for control, a fundamental psychological motive (Presson & Benassi, 1996; Seligman, 1975; Skinner, 1995), relates to stereotyping.

The present work explores how and why psychological control relates to stereotyping and also examines for whom this psychological process should be most pronounced. Specifically, we draw from compensatory control theory (Friesen, Kay, Eibach, & Galinsky, 2014; Kay, Gaucher, McGregor, & Nash, 2010; Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kay, Laurin, Fitzsimons, & Landau, 2014; Kay, Sullivan, & Landau, 2014; Kay, Whitson, Gaucher, & Galinsky, 2009; Landau, Kay, & Whitson, 2015; Laurin, Kay, & Moscovitch, 2008; Shepherd, Kay, Landau, & Keefer, 2011), which proposes that the desire to maintain personal control may be part of a broader motivation to maintain the belief that the world is predictable, orderly and non-random. Many studies on compensatory control have found that the motivation to maintain the belief that the world is orderly and controllable can be satisfied by increasing perceptions of both personal as well as external agency (e.g., belief in a controlling God, Kay et al., 2008). Importantly, internal and external sources of agency are substitutable - or *compensatory* - in helping people maintain orderly world perceptions, and the tendency to turn to personal or external agency to maintain feelings of predictability and order is moderated by various cultural (e.g., self-construal, Landau et al., 2015) and contextual factors (Kay et al., 2009). Recent theoretical innovations in compensatory control theory has named a third compensation affirmation strategy – an increased preference for simple and coherent interpretations of the external world (or "epistemic structure," Landau et al., 2015) when people lack control (Landau et al., 2015). Examples of control-motivated epistemic structure-seeking have been shown in a variety of domains, ranging from endorsement of conspiracy theories (Whitson & Galinsky, 2008) to increased religiosity (Kay et al., 2008), governmental defense (Kay, Shepherd, Blatz, Chua, & Galinsky, 2010), and pattern perception (Wang, Whitson, & Menon, 2012). Since many cognitive accounts of stereotypes suggest that stereotypes imbue the external social world with structure and meaning (Brewer, Dull, & Lui, 1981; Fiske & Taylor, 1991), we propose that stereotypes provide the psychological

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reassurance that the social world is a non-random and predictable place. Therefore, stereotypes should be especially appealing when people lack control, and this association may be particularly pronounced among those who are chronically oriented towards others.

1. Previous considerations of control motivation and stereotyping

Existing research on control-motivated stereotyping offers mixed predictions on how control relates to stereotyping. According to the power-as-control model, lower (vs. higher) control should lead to less (rather than more) stereotyping. In this model, Fiske (1993, 2000) considers the impact of interpersonal control (or power) on stereotyping. Specifically, people whose outcomes are dependent on others (i.e., those with low interpersonal control) seek to restore predictability and order by seeking information about powerful others (Pittman, 1998).[1] Fiske and colleagues (e.g., Neuberg & Fiske, 1987; Ruscher & Fiske, 1990) further found that powerless people specifically seek information that may be stereotype-inconsistent, and it is the possession of stereotype inconsistent information that subsequently reduces their tendency to stereotype powerful others. Although this model clearly predicts that lower interpersonal control leads to less stereotyping of powerful others in concrete and specific social situations, it is unclear if low perceived control will also lead to less stereotyping of general, abstract social groups (e.g., men vs. women).[2] Further, although power can satisfy a need for control, power and control are distinct constructs—indeed, personal control can be high even in the absence of power, such as when high control is afforded simply by having many choices (Ma, Yang, & Savani, 2019) or by strong feelings of individual efficacy (Inesi, Botti, Dubois, Rucker, & Galinsky, 2011).

Another stream of research that has considered how control may relate to stereotyping is the group-based control restoration model by Fritsche et al. (2008; 2013). Research on this model has found, for example, that participants are more likely to endorse positive stereotypes about their ingroup and negative stereotypes about an outgroup when they experience low (vs. high) control (Study 1, Fritsche et al., 2013). However, the group-based control restoration model addresses how control motivation influences prejudice and intergroup bias (ingroup favoritism and outgroup derogation), and not stereotyping in particular. For example, people who lacked control view their ingroup (vs. outgroups) as more competent and warm (Study 3, Fritsche et al., 2013), even in contexts in which neither competence nor warmth are stereotypes of either group. Stereotypes, however, are not merely about ingroup favoritism or outgroup bias, but hold specific content – content that can even be positive for some outgroups (Czopp, Kay, & Cheryan, 2015). Thus, although the group-based control restoration model sheds important light on how control needs may relate to in- (vs. out-) group preferences and biases, it is not a theory of control-motivated stereotyping, per se. This is an important distinction, insofar as the two models lead to different predictions in contexts in which stereotypes of the outgroup are positively valenced, an issue we explore in the present work.

2. Previous research on need for structure and stereotyping

Why might lower feelings of personal control increase social stereotyping? Recent theoretical innovations in compensatory control theory (Landau et al., 2015) suggest that low personal control is associated with a heightened need for structure, and a considerable body of theory and research suggests a desire for structured interpretations of the social and physical environment in turn leads to stereotyping. For example, people who have high need for cognitive closure are more likely to endorse ethnic stereotypes (Webster & Kruglanski, 1997). Similarly, a high need for cognition (i.e., the extent to which someone "engages in and enjoys thinking," p. 1, Cacioppo & Petty, 1982), is associated with a lower need for cognitive closure and need for structure (Webster & Kruglanski, 1997) as well as lower acceptance of stereotyping (Hall & Carter, 1999).

Interestingly, although the bulk of theoretical considerations do predict that personal need for structure, or the desire to structure and organize the environment (Neuberg & Newsom, 1993), should lead to greater stereotyping, most studies considering both personal need for structure and stereotyping tend to treat personal need for structure as a moderator variable that amplifies the effect of other factors on stereotyping (Moskowitz, 1993; Neuberg & Newsom, 1993; Schaller, Boyd, Yohannes, & O'Brien, 1995). For example, terror management theory argues that mortality salience leads people to endorse stereotypes because stereotypes provide a predictable and stable cultural reality (Schimel et al., 1999). To test this, Schimel et al. (1999) used personal need for closure as a moderator of mortality salience effects on liking of stereotype consistent (vs. inconsistent) targets and found that mortality salience led to decreased liking of stereotype inconsistent targets among people with high (vs. low) need for closure. Landau, Greenberg, Solomon, Pyszczynski, and Martens (2006) used a similar design where they examined how need for structure and mortality salience interactively influence liking of meaningless art and found that mortality salience led to decreased liking for meaningless art among individuals with higher (vs. lower) chronic personal need for structure (Landau et al., 2006). Although the results of these studies do generally support the notion that stereotypes are examples of social structure, due to a reliance on using need for structure as a moderator, past research has often left the correlational relationship between need for structure and the dependent variable (i.e., social stereotyping) unexamined.

Furthermore, studies that have tested the correlation between personal need for structure and stereotyping have yielded mixed results. Some have found no significant correlation. For example, personal need for structure was not significantly correlated with ethnic stereotyping of African Americans, Asians, and Latinos ($N_{\text{Study 5}} = 110$, Levy, Stroessner, & Dweck, 1998), or stereotyping of Palestinians ($N_{\text{Study 1}} = 182$, Bar-Tal & Guinote, 2002). Others, however, have observed the predicted correlation, as higher need for structure was significantly correlated with greater stereotyping of Muslims ($N = 161$, Newheiser & Dovidio, 2012), as well as greater tendency to use overly simplistic strategies to evaluate certain groups ($N_{\text{Study 1}} = 28$, $N_{\text{Study 2}} = 71$; Schaller et al., 1995). Although not all these correlations were statistically significant, the direction of the correlations consistently indicated that higher need for structure was associated with greater stereotyping. Combined with the fact that constructs (e.g., need for closure, need for cognition) that are conceptually similar to personal need for structure have been shown to be significantly related to stereotyping (Hall & Carter, 1999; Kruglanski, Pierro, Mannetti, & De Grada, 2006), we think that one potential reason for these mixed results might be low statistical power. Indeed, the mean sample size across studies described above was 110. Assuming a small-to-medium effect size of $r = 0.20$ (Cohen, 1992), which is typical of behavioral science as a whole (Richard, Bond Jr, & Stokes-Zoota, 2003), a sensitivity analysis

[1] We note that this may not be the case when people doubt that they will be able to indeed restore control (see Pittman & D'Agostino, 1989), an idea that is also consistent with learned helplessness models (Sedek & Kofta, 1990).

[2] We thank a reviewer for noting that certain abstract groups can also be powerful (e.g. men vs. women) – in other words, "powerful" and "abstract" are not mutually exclusive categories. It is possible that those who lack control also seek stereotype inconsistent information about these abstract powerful groups. However, seeking stereotype inconsistent information about abstract powerful groups does not necessarily lead to less stereotyping. Whereas having stereotype inconsistent information about a specific person within a concrete, interpersonal context clearly says something about that powerful person, this is not necessarily the case for abstract group stereotypes. For instance, people may perceive stereotype inconsistent individuals (e.g., effeminate men) as unrepresentative of the abstract group ("men in general") and therefore create new stereotypes for these stereotype inconsistent people, a process known as "subtyping" (Weber & Crocker, 1983).

suggest that this sample size provides only 56% power for detecting $r = 0.20$.

In sum, our work provides a novel consideration of need for structure as a mediator of the link between control and stereotyping, and we use larger sample sizes to provide more powerful tests of such effects. We predict that low control should lead to greater need for structure, which then in turn should be associated with greater stereotyping.

Our decision to employ need for structure as a mediator (as opposed to moderator) may be surprising, given that other threat and defense research (e.g., terror management theory) has used need for structure as a moderator, and the fact that the relation between need for structure and stereotyping is mixed. While it makes sense to use need for structure as a moderator in other theories of threat compensation, within the context of compensatory control theory, using need for structure as mediator affords a more straightforward test of whether low (vs. high) control leads to a heightened need for structure and subsequent stereotyping. In other words, we are interested in understanding if and why low control leads to stereotyping (i.e., need for structure as mediator), and not whether people who are high or low in trait measures of structure-seeking (i.e., the Personal Need for Structure Scale) are likely to stereotype when lacking control.

3. The moderating role of interdependent self-construal

To date, limited compensatory control research has considered moderators of control-motivated structure-seeking (Landau et al., 2015). That is, are some people more likely to seek certain epistemic sources of structure compared to others when lacking control? If so, what kinds of structure do they seek? We assess an important, theoretically-derived moderator variable of the link from control to stereotyping: interdependent self-construal. Compensatory control theory has highlighted interdependent self-construal as a highly relevant and important moderator of control-motivated structure-seeking (Landau et al., 2015, p. 714–715) and we provide two rationales for its potential moderating effects here.

3.1. People with interdependent self-construal may be more likely to seek structure when lacking control

Past research suggests that people with interdependent self-construal may be more likely to seek structure when lacking control because they are relatively less likely to want to highlight the self as a causal agent in the process of coping with control loss (Morling & Evered, 2006). As social relationships require relational accommodation (as opposed to self-assertion, Morling & Evered, 2006), people who value their social relationships may be less likely to assert the self and directly bolster their personal control when control is threatened, choosing instead to seek epistemic structure. For example, aggressive self-assertion (i.e., personal agency) is strongly discouraged in the interdependent and collectivistic Japanese culture because doing so strains interpersonal relations, which requires relational accommodation and the "ability to yield in good grace" as opposed to "ability to assert" (Azuma, 1984, p. 970; Sastry & Ross, 1998). Indeed, even in individualistic Western contexts, people who have a strong desire for personal control tend to have fewer close friends because they do not like to set aside their own needs when socializing with others and dislike the unpredictability associated with social situations (Burger, 1989, 1992). Therefore, people with independent self-construal may opt to directly bolster their personal control when lacking control (as opposed to seek epistemic structure). To them, regaining control directly (and by themselves) enhances their self-esteem and affirms their personal capabilities (Snibbe & Markus, 2005).

3.2. People with interdependent self-construal are more likely to engage in stereotyping as a social (vs. personal) psychological defense when they lack control

Another possibility –and one that is not mutually exclusive and may operate in tandem with the explanation proposed above – is that interdependent self-construal is also likely to moderate the type of structure that people seek when they lack control. Psychological threats lead to a variety of different reactions, ranging from increased group-identification or risk-taking to bolstering of personal conviction and ideals. These reactions have been grouped into two distinct categories: social versus personal reactions (Jonas et al., 2014). Whereas personal reactions refer to those that are intrapersonal and relatively unrelated to the social context, social reactions refer to those which "are nested within social contexts, involve social support in interpersonal relations, or rely on social identities in group-related contexts" (p. 247, Jonas et al., 2014). Since interdependent self-construal is defined as the extent to which people "think and behave in ways that emphasize their connectedness to others" (p. 791, Cross, Bacon, & Morris, 2000), people with interdependent self-construal may more likely to compensate via social (vs. personal) means when lacking control. Perceiving greater structure within the social environment may in turn bolster confidence to take action in social interactions (Kay et al., 2014).

4. Present research

We test our model of control-motivated stereotyping within the context of gender and occupational stereotyping. We also use a combination of positive and negative stereotypes to rule out the possibility that the link between control and stereotyping is driven by feelings of negativity alone instead of structure-seeking more generally. Experiencing a lack of control can be aversive (Alloy & Abramson, 1982), and people may derogate others (e.g., endorse negative stereotypes about others) simply because they want to feel better about themselves (Fein & Spencer, 1997), and not because they seek order and certainty through stereotyping. In order to rule out this alternative explanation, we aim to show that lower control also leads to greater positive stereotyping. We explore how individual (measured) states of perceived control relate to gender (Study 1) and occupational (Study 3) stereotyping. To establish causality (Study 2a and 2b), we manipulate control and measure stereotyping. In sum, we predict that:

Hypothesis 1. Lower perceived control, both measured and manipulated, will be associated with greater stereotyping.

Hypothesis 2. Higher need for structure will mediate the relationship between lower personal control and greater stereotyping.

Finally, we predict that interdependent self-construal will moderate the relation between control, structure-seeking, and stereotyping, such that people with a more interdependent self-construal will be more likely to seek structure and stereotype under control threat. Thus:

Hypothesis 3. Interdependent self-construal will moderate the link between lower control and greater need for structure, such that control-motivated structure-seeking and stereotyping will be stronger among people with high (vs. low) interdependent self-construals.

We test these hypotheses across four studies. Study 1 examined whether perceived control is correlated with gender stereotyping using archival data from World Values Survey (Hypothesis 1). We also examined if country-level measures of interdependent self-construal moderated the relation between control and gender stereotyping. Study 2a investigated if manipulated feelings of control changes people's tendency to endorse gender stereotypes, and if this association is both mediated by need for structure and moderated by interdependent self-construal (Hypotheses 2 and 3). Study 2b sought to replicate the findings of Study 2a with another control manipulation (Hypotheses 2 and

3). Finally, Study 3 tested whether the control-motivated stereotyping model holds within the context of occupational stereotyping (Hypotheses 2 and 3).

Following Simmons, Nelson, and Simonsohn' (2011) recommendations, we report how all sample sizes were determined, as well as all manipulations, exclusions, and measures. For all studies, we aimed to recruit enough people to detect an effect size of $d = 0.43$, which is typical of published papers in behavioral science (Richard et al., 2003). This effect size was used as a guide for the minimum number of participants to recruit, but we recruited as many participants as our budget allowed. Data for each study were collected in one wave, and no additional data were collected after analyses. When we collected our own data as opposed to using archival data sources, we made sure to exclude participants who had participated in our previous studies. All supplementary materials, data, materials, and analytical syntax are available at https://osf.io/embpx/. All analyses were completed in statistical program Stata 15.

5. Study 1

We designed Study 1 to achieve several goals. The first was to examine whether lower perceived control predicted increased stereotyping (Hypothesis 1), and the second was to test if this would generalize across cultures and countries. We also examined if the hypothesized relationship was robust after the inclusion of relevant demographic variables (such as respondent's sex, age, and political orientation). Finally, we examined whether the relation between control and stereotyping was moderated by country-level scores of interdependent self-construal. To do so, we obtained mean interdependent self-construal scores for different countries (Cheng et al., 2011) and merged these scores with the World Values Survey data. We predicted that interdependent self-construal would moderate the link between lower control and greater stereotyping, such that this relationship will be stronger for countries with higher (vs. lower) average interdependent self-construal scores.

5.1. Method

5.1.1. Participants and procedure

We used multi-wave cross sectional data from the World Values Survey (1981–2014), which used face-to-face interviews from 1981 to 2014 in a large number of countries around the world. Data on the core variables of interest were available from 309,382 participants across 99 countries.

5.1.2. Perceived control

We used a one-item measure of perceived control that was included in the survey ("Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale to indicate how much freedom of choice and control you feel you have over the way your life turns out"). This item was measured on a 10-point scale (1 = *no choice at all*, 10 = *a great deal of choice*).

5.1.3. Interdependent self-construal

Cheng et al. (2011) used the revised self-construal scale (Singelis, 1994) to compute country-level scores of interdependent self-construal. This index ranged from 15 to 105, with higher scores indicating greater country-level interdependent self-construal scores.

5.1.4. Gender stereotyping

We used a composite of an 11-item measure of gender stereotyping. These items were: "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work", "A pre-school child is likely to suffer if his or her mother works", "A job is alright but what most women really want is a home and children," "Being a housewife is just as fulfilling as working for pay," "Having a job is the best way for a woman to be an independent person," "Both the husband and wife should contribute to household income," "On the whole, men make better political leaders than women do," "If a women earns more money than her husband, it's almost certain to cause problems," "A university education is more important for a boy than for a girl," "On the whole, men make better business executives than women do," and "When jobs are scarce, men should have more right to a job than women." All items except the last item were measured on a 4-point scale (1 = *agree strongly*, to 4 = *strongly disagree*). The last item was measured on a 3-point scale (1 = *agree*, 2 = *disagree*, 3 = *neither*). After reverse coding relevant items, we standardized and averaged all the items to form a single composite score of stereotyping ($\alpha = 0.60$).[3] Higher numbers on this scale indicated greater stereotyping.

5.1.5. Demographic variables

The World Values Survey includes a diverse range of demographic variables, including age, gender (1 = *male* and 2 = *female*), income (1 = *lowest income group*, 10 = *highest income group*), political orientation (1 = *left* to 10 = *right*), and education (ranging from 1 = *no formal education* to 9 = *university level education*). We included these demographic variables as covariates. We included all our variables as fixed effects (γ).

6. Results and discussion

We tested two-level multilevel models with robust standard errors. We included random intercepts and slopes for personal control in all the models that we tested. Table 1 presents the results. In our first model, we included personal control (individual level) as a predictor of stereotyping. Above and beyond the effects of random variation between countries for both intercept ($\sigma^2 = 0.07$, $SE = 0.01$, 95% C.I. [0.049, 0.096]) and slope ($\sigma^2 = 0.0002$, $SE = 0.00003$, 95% C.I. [0.0001, 0.0002]), lower personal control was associated with greater stereotyping, $\gamma = -0.01$, $SE = 0.001$, $z = -7.71$, $p < .001$, 95% C.I. [−0.014, −0.008]. These results support the notion that people with a lower sense of personal control were more likely to endorse gender stereotypes. Of the 99 countries in the data, lower perceived control was reliably associated with greater stereotyping in 86 of them (details in Supplementary Materials). Gender of the participant[4] did not

[3] The World Values Survey administers a slightly different set of items across the 6 waves. Since reliability cannot be measured for items that are systematically missing in some waves, our reliability estimate is based on the 7 items that were available across all the different waves. These 7 items are: "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work", "Being a housewife is just as fulfilling as working for pay," "Both the husband and wife should contribute to household income," "On the whole, men make better political leaders than women do," "A university education is more important for a boy than for a girl," and "A pre-school child is likely to suffer if his or her mother works," and "When jobs are scarce, men should have more right to a job than women."

[4] People sometimes endorse positive and communal stereotypes about women (e.g., warm, kind, friendly) because they are motivated to preserve existing gender hierarchies (Glick & Fiske, 1996; Morton, Postmes, Haslam, & Hornsey, 2009). Therefore, some alternative models, like the group-based model of control, might predict that having low control may cause men (vs. women) to be more likely to endorse positive stereotypes about women when they lack control because doing so strengthens the relative hierarchical position of the male ingroup (relative to female out-group). By endorsing these communal women stereotypes, men may bolster the relative perceived powerfulness of their ingroup, and this in turn should increase the amount of control that they can derive from identifying with their male ingroup. Thus, we also tested for moderation by participant gender. Our model of control-motivated stereotyping does not necessarily predict any pattern of gender moderation, though it does not suggest both effects cannot co-occur (i.e., a main effect and moderation by participant gender).

Table 1
Perceived control as a predictor of stereotyping (Study 1).**

	Fixed effects γ (SE)					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Individual level						
Intercept	0.05(0.03)	0.31(0.03)***	0.13(0.04)***	0.33 (0.05)***	−3.59(0.95)***	−3.43(0.92)***
Gender		−0.17(0.01)***	−0.19(0.01)***	−0.19(0.009)***	−0.15(0.02)***	−0.15(0.02)***
Age			0.002(0.0002)***	0.002 (0.0002)***	0.003(0.0002)***	0.003 (0.0002)***
Education			−0.04(0.002)***	−0.04(0.002)***	−0.04(0.002)***	−0.04(0.002)***
Right wing orientation			0.02(0.003)***	0.02 (0.003)***	0.04(0.006)***	0.04 (0.006)***
Income			−0.008(0.002)***	−0.008 (0.002)***	0.002(0.005)	0.002 (0.005)
Personal control	−0.01(0.001)***	−0.009(0.003)***	−0.009(0.002)***	−0.009 (0.001)***	−0.01 (0.002)***	0.05(0.03)*
Personal control × Gender		−0.002(0.001)	−0.0008(0.002)			
Country level						
Interdependent self-constual (ISC)					0.05(0.01)***	0.05(0.01)***
Cross-level interaction						
Personal control × ISC						−0.0009 (0.0004)*

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

significantly moderate the relation between perceived control and gender stereotyping, $\gamma = -0.002$, $SE = 0.001$, $z = -1.61$, $p = .108$, 95% C.I. [−0.005, 0.0005] (Table 1, Model 2). After controlling for other demographic variables, gender also did not significantly moderate the relation between perceived control and stereotyping, $\gamma = -0.0008$, $SE = 0.002$, $z = -0.51$, $p = .609$, 95% C.I. [−0.004, 0.002] (Table 1, Model 3).

Next, we tested the relationship between personal control and stereotyping after controlling for demographic variables. Above and beyond the effects of random variation between countries for intercepts ($\sigma^2 = 0.07$, $SE = 0.01$, 95% C.I. [0.048, 0.099]), and slopes ($\sigma^2 = 0.001$, $SE = 0.00002$, 95% C.I. [0.00006, 0.0002]), we found that lower control was associated with greater stereotyping, $\gamma = -0.009$, $SE = 0.001$, $z = -7.92$, $p < .001$, 95% C.I. [−0.011, −0.007] (Table 1, Model 4).

Finally, to test moderation by interdependence, we conducted two additional multi-level models to examine whether interdependent self-construal (at the country level) moderated the link between personal control and stereotyping. Main effect analyses indicated that lower control was associated with greater stereotyping, $\gamma = -0.01$, $SE = 0.002$, $z = -4.36$, $p < .001$ 95% C.I. [−0.016, −0.006], and stereotyping was also more prevalent in countries with higher (vs. lower) interdependent self-construal scores, $\gamma = 0.05$, $SE = 0.01$, $z = 3.75$, $p < .001$, 95% C.I. [0.024, 0.078] (see Table 1, Model 5). More importantly, we observed a significant interaction between personal control and interdependent self-construal, $\gamma = -0.0009$, $SE = 0.0004$, $z = -2.58$, $p = .010$, 95% C.I. [−0.002, −0.0002] (see Table 1, Model 6). Simple slope analyses indicated that the link between personal control and stereotyping is negative and significant for countries with both low (and high) interdependent self-construal scores. However, the negative relationship between personal control and stereotyping is stronger in countries at one standard deviation above the mean country-level measure of interdependent self-construal scores, $b = -0.01$, $SE = 0.002$, $z = -6.07$, $p < .001$, 95% C.I. [−0.018, −0.009], compared to those at one standard deviation below the mean country level measure of country interdependent self-construal scores, $b = -0.007$, $SE = 0.003$, $z = -2.34$, $p = .019$, 95% C.I. [−0.013, −0.001] (see Fig. 1).

These results suggest that the link between control and stereotyping was stronger in countries with higher levels of interdependent self-construal scores. However, since there are times when country (vs. individual) level analyses lead to a different pattern of results (e.g., Marini et al., 2013), we sought to replicate these preliminary findings at the individual level using the same measure of interdependent self-construal in the next studies.

Another limitation of Study 1 is that the items may have been imperfect measures of stereotyping. For example, many of the items may have been measuring sexism (e.g., Napier, Thorisdottir, & Jost, 2010), or traditional gendered social roles (e.g., women should take care of children, men should be business executives), and also appear to have negative evaluative content. In other words, the dependent variable that we used in Study 1 may capture "attitudes" (e.g., sexism) as opposed to "beliefs" (e.g., stereotypes) about women. Although sexism (attitudes towards women) and gender stereotypes (beliefs about women) tend to be highly correlated (Glick & Fiske, 1996, p. 506), we believe that Study 1 provide suggestive but not clear evidence for control-motivated stereotyping. In the next two studies, we sought to remedy this limitation by using an established measure of gender stereotypes (Gill, 2004).

A last limitation of this study is that we used a psychometrically weak single-item measure of control in this study. We aimed to remedy this limitation in Study 3.

7. Study 2a

Study 1 was correlational. In Study 2a, we manipulated personal control and measured need for structure and stereotyping. In addition, we again tested whether interdependent self-construal moderates this relation. We predicted that low (vs. high) control will lead to greater gender stereotyping (Hypothesis 1), and that this link will be mediated by a greater need for structure (Hypothesis 2), and moderated by interdependent self-construal (Hypothesis 3).

Additionally, it is important to rule out the explanation that Study 1 effects were simply the result of negativity associated with having low personal control. Therefore, in Studies 2a and 2b, we use a measure of gender stereotyping (Gill, 2004) that contains both positive (e.g., women are warm) and negative gender stereotypes (e.g., women cry easily). We recruited an independent sample of Mechanical Turk workers to rate these gender stereotype items on perceived valence, allowing a test of whether the relationship between control on stereotyping is moderated by item valence.

7.1. Method

7.1.1. Participants and procedure

We recruited 409 adults (232 females, 171 males, 6 unreported) from Amazon's Mechanical Turk. Participants ranged in age from 18 to 77 years old ($M_{age} = 35.77$, $SD = 12.53$). Based on calculations made using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), the final sample provided 80% power of detecting a minimum of $d = 0.28$ for the causal effect of control on stereotyping.

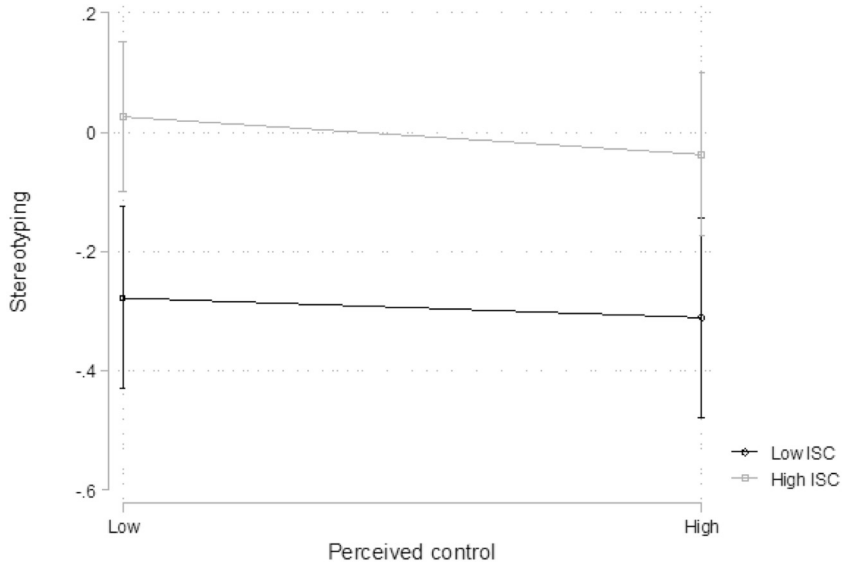

Fig. 1. Stereotyping as a function of personal control and mean country interdependent self-construal (ISC) scores. Bars represent 95% confidence intervals.

7.1.2. Interdependent self-construal measure

We first asked participants to complete a 12-item measure of interdependent self-construal (Singelis, 1994). A sample item is "I have respect for the authority figures with whom I interact." We measured all items using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*, $\alpha = 0.80$).

We then randomly assigned participants to one of two conditions, the low control condition or the high control condition. Because the strength of manipulation may be reduced if participants are non-naïve (Chandler, Mueller, & Paolacci, 2014), in this study, we opted to use a relatively new manipulation of personal control (Ma, Landau, Narayanan, & Kay, 2017, Study 2) adapted from research on thought suppression (Wegner, Schneider, Carter, & White, 1987).

7.1.3. High control condition

We told participants in the high control condition to complete a focusing task. The task consisted of three separate 30-second trials during which they were told to stare at the screen at all times. We told participants that we were interested in people's ability to stare at a sentence and think about the object mentioned in the sentence. In the first trial, we asked them to stare at the sentence "Think of a white bear," and click the screen every time they thought about the object "white bear." After the first 30-second trial, the page automatically proceeded to the second 30-second trial. In the second trial, we asked them to stare at the sentence "Think of a treadmill," and click the screen every time they thought about the object "treadmill." In the last 30-second trial, we asked them to stare at a sentence about a "warm coffee" and click the screen every time they thought about the object "warm coffee." Additional details of the manipulation can be found in Ma et al. (2017).

7.1.4. Low control condition

We also told participants in the low control condition to complete a focusing task consisting of three separate 30-second trials. We told them we were interested in people's ability to stare at a sentence and *not* think about the object mentioned in the sentence. In the first trial, we asked them to stare at the sentence, "Do not think of a white bear," click the screen every time if they thought about the object "white bear." After the first 30-second trial, the page automatically proceeded to the second 30-second trial. In the second trial, we asked them to stare at the sentence, "Do not think of a treadmill," and click the screen every time if they thought about the object "treadmill." In the last 30-second trial, we asked them to stare at a sentence, "Do not think of a warm coffee," and not think about the object "warm coffee." They were also supposed to click on the screen if they thought about a "warm coffee."

7.1.5. Manipulation check

We asked participants to complete a single item measure about the extent they could control their thoughts during the focusing task. This was administered on a 7-point scale (1 = *not at all*, 7 = *very much*).

All participants then completed the following measures of need for structure and gender stereotyping (which were counterbalanced).

7.1.6. Personal need for structure

We measured need for structure using a 12-item scale (Neuberg & Newsom, 1993) that included items such as "I enjoy having a clear and structured mode of life" ($\alpha = 0.87$). We measured these items on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*).

7.1.7. Gender stereotyping

To measure gender stereotyping, we asked participants to consider eight stereotypically feminine traits (e.g., gentle) and eight stereotypically masculine traits (e.g., hardworking, Gill, 2004). In this gender stereotyping scale, there was a descriptive measure and a prescriptive measure, and both measures used the same set of 16 masculine and feminine traits (making a total of 32 items in this gender stereotype scale). In the descriptive measure, each trait item began with the phrase "I believe that, on average, women are…," whereas each item on the prescriptive measure began with the phrase "Ideal women, in my view, should be" (Gill, 2004). We measured all these items on a 7-point semantic differential scale (1 = *less than men*, 7 = *more than men*). Examples items are, "I believe that, on average, women are… (1 = *less gentle than men*, 7 = *more gentle than men*)", and "Ideal women, in my view, should be… (1 = *less gentle than men*, 7 = *more gentle than men*). Since we did not find that control influenced descriptive but not prescriptive stereotypes (or vice versa), we reverse coded all the masculine traits, and averaged all thirty-two descriptive and prescriptive items so that the final resulting composite reflected greater stereotypical beliefs about women ($\alpha = 0.92$).

7.1.8. Valence of stereotyping items pre-test

In addition, we recruited an independent sample of 100 Mechanical Turk workers to rate each of these 16 gender stereotype items on perceived valence. We told these 100 raters that these items have been commonly used to describe people (e.g., emotional, cry easily, independent), and asked them to rate the extent to which they believe that it is positive or negative for people in general to be described in

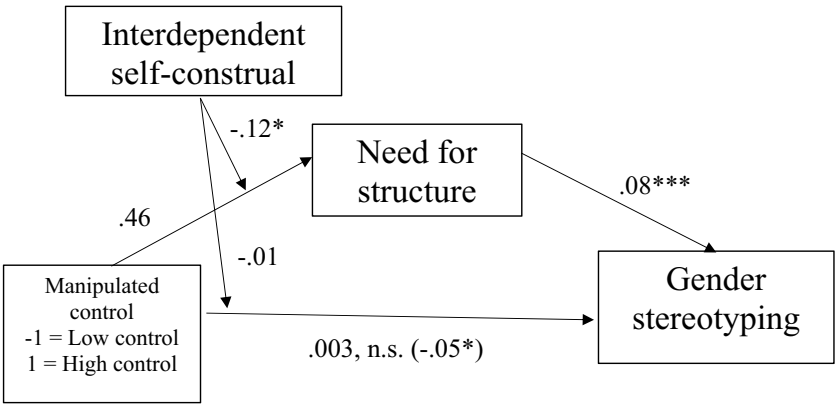

Fig. 2. Relationships between control, structure, interdependent self-construal and gender stereotyping; Study 2a. Values in parentheses represent the total effect of manipulated control on gender stereotyping. Unstandardized coefficients. The coefficients of the control to need for structure and control gender stereotyping paths represent simple effects. The coefficient of the need for structure to gender stereotyping path represents a main effect. *$p < .05$ **$p < .01$ ***$p < .001$.

that particular way (e.g., emotional, cry easily, independent) on 7-point scales ranging from −3 (very negative) to 3 (very positive). The midpoint of the scale (or 0) represented "neither positive nor negative." We then averaged ratings from 100 raters to compute an average valence score for each gender stereotype item.

7.2. Results and discussion

7.2.1. Manipulation check

An independent samples *t*-test indicated that participants in the low control condition ($M = 3.83$, $SD = 1.72$) reported that they experienced less control over their thoughts than those in the high control condition ($M = 5.09$, $SD = 1.61$), $t(407) = -7.66$, $p < .001$, $d = 0.76$.

7.2.2. Gender stereotyping

An independent samples *t*-test indicated that participants in the low control condition ($M = 4.42$, $SD = 0.49$) were significantly more likely to endorse gender stereotypes than those in the high control condition ($M = 4.31$, $SD = 0.43$), $t(407) = 2.40$, $p = .017$, $d = 0.24$.

7.2.3. Moderated mediation

Next, we tested moderated mediation, in which we hypothesized that interdependent self-construal would moderate the relationship between control, structure-seeking, and stereotyping (Hypotheses 2 and 3, see Fig. 2). We tested whether the index of moderated mediation significantly differs from zero (Hayes, 2015), which conceptually is the test of whether the indirect effects via need for structure are systematically larger for certain values of interdependent self-construal (i.e., moderated mediation). As predicted, we found a significant index of moderated mediation, *Coeff* = −0.01, *SE* = 0.006, 95% bias-corrected C.I. [−0.025, −0.0005].[5,6,7] We probed the indirect effects via need for structure at the seven values of interdependent self-construal that corresponded to the 7- point scale that we used to measure interdependent self-construal.[8] We found that at values of interdependent self-construal that are lower than 4 (lower interdependent self-construal), the indirect effects were non-significant, *Coeffs* = 0.009 to 0.03, *SE* = 0.01 to 0.02, 95% bias-corrected C.I. [−0.008 to −0.005, 0.033 to 0.084]. At levels of interdependent self-construal equal to and greater than 5, the indirect effects were significant, *Coeff* = −0.03 to −0.01, *SE* = 0.005 to 0.02, 95% bias-corrected C.I. [−0.071 to −0.024, −0.003 to −0.006]. These results indicate that the relationships between control, need for structure, and gender stereotyping hold only for people with higher (vs. lower) interdependent self-construal.

Next, we examined whether the relation between control and stereotyping was moderated by participant gender. We included the experimental condition (−1 = low control, 1 = high control) as a predictor variable, and participant gender as the categorical moderator (1 = Female, 2 = Male), and found a significant interaction, $b = 0.19$, $SE = 0.09$, $t(399) = 2.02$, $p = .044$, 95% C.I. [0.005, 0.366]. However, the pattern of interaction suggests that both men and women are equally likely to endorse gender stereotypes when control is low, but at high levels of control, men are significantly more likely to endorse gender stereotypes than women (see supplementary materials for more details). Since men (vs. women) were not more likely to endorse gender stereotypes when they lacked control, this finding did not support the group-based control model.

Finally, we examined if the valence of the stereotype moderated the effect of control on gender stereotyping. To do so, we merged independent pre-tested valence ratings with data from this study. We then transformed the data such that the dependent gender stereotype variable (the 32-item of measure of gender stereotyping) was nested within each person. We included valence of each gender stereotype item as a continuous within-level moderator variable, and experimental condition (−1 = low control, 1 = high control) as a categorical between-level variable. To analyze the data, we conducted a multilevel linear regression with restricted maximum likelihood estimation, which produces unbiased standard errors and parameter estimates with nested data (Hox, 2010). The Control X Item valence interaction was not significant, suggesting that the relation between low control and greater stereotyping did not reliably vary depending on the valence of the stereotype item, $\gamma = -0.03$, $SE = 0.02$, $z = -1.19$, $p = .234$, 95% C.I.

[5] To examine if people with interdependent self-construal are more likely to employ social (vs. personal) forms of psychological defense against threat, we also tested whether all three paths between control, need for structure and stereotyping were moderated by interdependent self-construal in Studies 2a, 2b, and 3. Unlike the control to structure path, we found that the structure to stereotyping path was not significantly moderated by interdependent self-construal in all three studies. This provides support for a first (but not second-stage) moderated mediation. Therefore, we did not find consistent support for the idea that interdependent self-construal shapes people's tendency to employ social (vs. personal) forms of psychological defense. Please see the Supplementary Materials for statistical details regarding these analyses.

[6] We also tested a model in which we switched the order of need for structure and stereotyping for Studies 2a, 2b, and 3. We did not find evidence for moderated mediation in these analyses. Please see the Supplementary Materials for statistical details regarding these analyses.

[7] We also examined whether need for structure moderates the effect of control on stereotyping in Studies 2a, 2b, and 3. We found that the Need for Structure × Manipulated Control interaction was not significant in Study 2a, *(footnote continued)* b = −0.02, SE = 0.02, t(405) = −1.02, p = .311, 95% C.I. [−0.069, 0.022], or Study 2b, b = −0.01, SE = 0.02, t(530) = −0.76, p = .450, 95% C.I. [−0.053, 0.024]. The Need for Structure x Perceived Control interaction was also not significant in Study 3, b = −0.04, SE = 0.03, t(368) = −1.53, p = .128, 95% C.I. [−0.094, 0.012].

[8] As suggested by Hayes (2015), we elected to not probe the indirect effects at one standard deviation above or below the mean of the continuous moderating variable.

[−0.073, 0.018].

In sum, Study 2a offered causal evidence for the effect of control on structure-seeking and stereotyping within individuals. We also found that control-motivated structure-seeking and stereotyping was stronger among people with interdependent self-construal.

8. Study 2b

One limitation in Study 2a was that the manipulation we used might have been confounded with factors such as cognitive load, which can lead to increased stereotyping (Sherman, Lee, Bessenoff, & Frost, 1998). As a result, the goal of Study 2b was to replicate the effects found in Study 2a with a more established manipulation of control (Kay et al., 2008). Specifically, to manipulate low (vs. high) control, we asked participants to recall a positive event that they had absolutely no control (vs. a great deal of control) over. Because it is possible that differences in perceived negativity (and not perceived control) associated with recalling feelings of low (vs. high) control would also lead to greater stereotyping, we explicitly asked participants to recall a positive event so as to ensure that it was differences in perceived control (and not differences in negativity) that was driving stereotyping.

8.1. Method

8.1.1. Participants and procedure

We recruited 600 adults from Prolific Academic. We excluded 21 participants who did not complete the recall task properly.[9] Due to recent concerns about possible computer programs designed to complete online studies, we further excluded 49 responses with duplicate geo-locations (Dennis, Goodson, & Pearson, 2018).[10] The final sample contained 530 participants (276 females, 246 males, 6 other, 2 unreported). Participants ranged in age from 18 to 78 years old (M_{age} = 34.86, SD = 12.62). The final sample provided 80% power of detecting a minimum of d = 0.24 for the causal effect of control on stereotyping. We pre-registered materials and analyses at: https://osf.io/efsar.[11]

8.1.2. Interdependent self-construal measure

Participants first completed a measure of interdependent self-construal. This was the same measure used in Study 2a (α = 0.75).

We then randomly assigned participants to either the low or the high control condition.[12]

8.1.3. Low control condition

Participants in the low control condition were told to complete the following writing task. For both conditions, we requested participants to write at least 50 characters before proceeding to the next page.

In the next few minutes, please try and think of something positive that happened to you in the past few months that you had NO CONTROL over. Please describe the event in no more than 100 words.

8.1.4. High control condition

Participants in the high control condition were told to complete the following writing task.

In the next few minutes, please try and think of something positive that happened to you in the past few months that you HAD CONTROL over. Please describe the event in no more than 100 words.

All participants then completed the following measures in this order:

8.1.5. Personal need for structure

All participants first completed the 12-item personal need for structure scale used in Study 2a (α = 0.86).

8.1.6. Gender stereotyping

Participants then completed the same stereotyping measure as in Study 2a (α = 0.91).

8.2. Results and discussion

8.2.1. Gender stereotyping

An independent samples t-test indicated that participants in the low control condition (M = 4.36, SD = 0.43) were more likely to endorse gender stereotypes than those in the high control condition (M = 4.30, SD = 0.38), $t(528) = 1.74$, $p = .082$, $d = 0.15$, although the difference did not reach statistical significance.

8.2.2. Moderated mediation

Next, we tested a model of moderated mediation, in which we hypothesized interdependent self-construal would moderate the relationship between control, structure-seeking, and stereotyping (Hypothesis 3, see Fig. 3). As predicted, we found a significant index of moderated mediation, $Coeff$ = −0.006, SE = 0.004, 95% bias-corrected C.I. [−0.017, −0.0003]. Therefore, we decided to probe the indirect effects via need for structure at the seven values of interdependent self-construal that corresponded to the 7- point scale that we used to measure interdependent self-construal. We again found that at values of interdependent self-construal that are lower than 4 (low interdependent self-construal), the indirect effects were positive, $Coeffs$ = 0.010 to 0.021, SE = 0.007 to 0.02, 95% bias-corrected C.I. [0.000009 to 0.0006, 0.030 to 0.063]. At levels of interdependent self-construal greater than 6, the indirect effects were negative and statistically significant, $Coeff$ = −0.01 to −0.008, SE = 0.005 to 0.009, 95% bias-corrected C.I. [−0.040 to −0.023, −0.0008 to −0.0003]. These results indicate that the hypothesized relationships between control, need for structure, and gender stereotyping held only for people with higher (vs. lower) interdependent self-construal.

Next, we examined whether the relation between control and stereotyping was moderated by the gender of the participant. We excluded participants who indicated “Other” as their gender from our analysis. We included the experimental condition (−1 = low control, 1 = high control) as a predictor variable, and gender of the participant as the moderator (1 = Female, 2 = Male), and did not find a significant interaction, b = 0.04, SE = 0.03, $t(518) = 1.07$, $p = .284$, 95% C.I. [−0.031, 0.106].

Finally, we examined if the effect of control on stereotyping was moderated by valence of the stereotype item. We merged independent valence ratings from the pre-test in Study 2a with data from Study 2b. Valence for each item was included as a within-level moderator variable, and experimental condition (−1 = low control, 1 = high control) as a between-level variable. We again conducted a multilevel linear regression with restricted maximum likelihood estimation. Again, we did not find that valence of the item significantly moderated the extent to which low (vs. high) control led to greater stereotyping. The Control X Item valence interaction was not significant, suggesting that the relation between low control and greater stereotyping did not reliably vary depending on the valence of the stereotype item, γ = −0.009,

[9] We excluded participants who wrote gibberish (e.g., “aisdisajdas”), who did not complete the recall task (e.g., “I cannot think of anything positive that happened in the past few months that I had no control over.”), who wrote bot-like responses (e.g., “yes i think i am a helpful man, i always try my best”), or those who did not write in English (e.g., “los mas positivo que..”). Please refer to the supplementary materials for a complete list of the essays we excluded.

[10] We did not have geolocation data from Study 2a because we collected the data before Qualtrics or the survey platform we used started providing geolocation data.

[11] We provide an annotated version of our pre-registration in the supplementary materials.

[12] This manipulation has often been used in past compensatory control research (Landau et al., 2015).

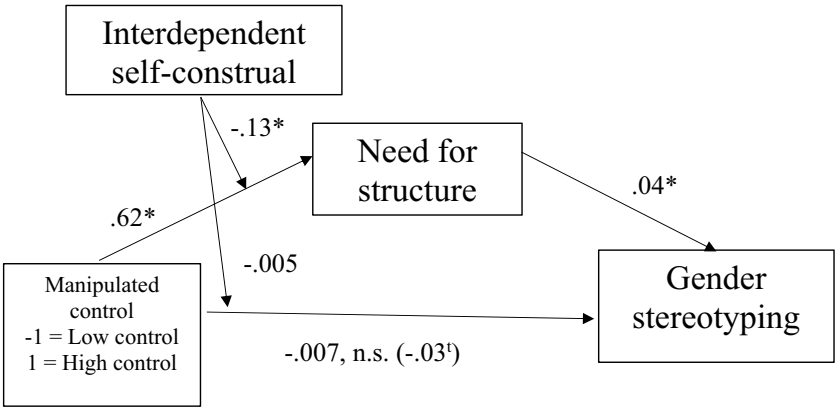

Fig. 3. Relationships between control, structure, interdependent self-construal and gender stereotyping; Study 2b. Values in parentheses represent the total effect of manipulated control on gender stereotyping. Unstandardized coefficients. The coefficients of the control to need for structure and the control to gender stereotyping paths represent simple effects. The coefficient of the need for structure to gender stereotyping path represents a main effect. $^{t}p = .082$
$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$.

SE = 0.009, $z = -0.99$, $p = .323$, 95% C.I. [−0.027, 0.009].

In sum, Study 2b replicated the primary effects of Study 2a. We found that low control leads to gender stereotyping, and also that control-motivated structure-seeking and stereotyping held for people with interdependent self-construal.

9. Study 3

The goal of Study 3 was to test our model within the context of occupational stereotyping. We decided to examine occupational stereotyping because endorsement of other types of stereotypes (e.g., racial stereotypes) may be more likely to be multiply determined. For instance, racial stereotyping could be explained in terms of intergroup struggle for social dominance (Sidanius & Pratto, 2001). Examining the relation between control and stereotyping within the context of occupational stereotyping thus affords a cleaner test of the idea that low control leads to greater need for cognitive structure and simplicity, and this desire for cognitive simplicity in turn manifests in greater endorsement of occupational stereotypes. Finally, we examined how control-motivated occupational stereotyping would be moderated by interdependent self-construal.

9.1. Method

9.1.1. Participants and procedure

We recruited 402 adults from Amazon's Mechanical Turk, and excluded 30 responses with duplicate geolocations. The final sample included 372 participant (202 females, 169 males, 1 unreported). Participants ranged in age from 19 to 76 years old (M_{age} = 39.92, SD = 13.49). Based on calculations made using G*Power, the final sample provided 80% power of detecting a minimum of $r = 0.19$. We pre-registered materials and analyses at: https://osf.io/4cqd5.[13]

9.1.2. Interdependent self-construal measure

We used the same items employed in Studies 2a and 2b (α = 0.76).

9.1.3. Perceived control

We used an established 10-item measure of personal control (Ma & Kay, 2017). A sample item is, "I have little control over the things that happen to me" (α = 0.91).

All participants then completed the following two measures, which were counterbalanced.

9.1.4. Need for structure

We used the same measure of need for structure as Studies 2a and 2b (α = 0.87).

[13] We provide an annotated version of our pre-registration in the supplementary materials.

9.1.5. Occupational stereotyping

We used an established measure of occupational stereotypes (Levy et al., 1998). Levy et al. (1998) first asked an independent sample of pre-test participants to consider 15 different traits (e.g., hardworking, intelligent, competitive) and select items that they thought were stereotypical of each of these four occupations: teachers, lawyers, politicians, and doctors. They considered traits as stereotypical if at least two-thirds of the pre-test participants agreed that certain traits were stereotypical. In their main study, they then asked another sample of participants to consider the degree to which they believed that these pre-tested occupational traits described the four occupational groups.

Consistent with Levy et al. (1998), we asked participants to consider and rate the extent to which teachers are "hardworking, intelligent," politicians are "competitive, dishonest, greedy, hardworking, intelligent, pushy, untrustworthy," lawyers are "competitive, dishonest, greedy, intelligent, pushy, untrustworthy," "not submissive," and doctors are "hardworking, intelligent" on a 7-point scale (1 = *not at all*, 7 = *very much*, α = 0.83). Although we planned to derive a composite measure of stereotyping by averaging scores on all eighteen measures, when we analyzed the reliability of this measure, we found that the intelligent and hardworking items for politicians should have been reversed. This may be because of a shift in popular opinion of politicians since 1998, when Levy and colleagues first pre-tested these traits. Therefore, we decided to reverse score the hardworking and intelligent items for politicians in our measure of occupational stereotyping. We also note that the directionality and significance of the effects did not substantively change after excluding these items from the measure of occupational stereotyping (see Supplementary Materials).

9.2. Results and discussion

Table 2 presents correlations between variables, means, and standard deviations.

9.2.1. Relation between control and occupational stereotyping

To test for a direct relation between personal control and occupational stereotyping, we regressed occupational stereotyping on perceived control. This demonstrated a predicted significant and negative correlation, $r = -0.12$, $p = .017$, 95% C.I. [−0.128, −0.013], indicating that lower feelings of control were associated with greater levels of occupational stereotyping.

9.2.2. Moderated mediation

We then tested moderated mediation, in which interdependent self-construal moderated the relationship between control, structure-seeking, and occupational stereotyping (see Fig. 4). We found that the index of moderated mediation was not significant, $Coeff = -0.0002$, SE = 0.009, 95% bias-corrected C.I. [−0.019, 0.016]. Indeed, the indirect effects were uniformly negative at all seven levels of

Table 2
Descriptive statistics and correlations for study 3.

Variable	*M*	*SD*	1	2	3	4	5
1. Perceived control	4.78	1.15	(0.91)				
2. Occupational stereotyping	5.35	0.65	−0.12*	(0.83)			
3. Interdependent self-construal	4.62	0.76	−0.19***	−0.19***	(0.76)		
4. Need for structure	4.79	0.96	−0.19***	0.17**	0.11*	(0.87)	

Note. Reliabilities are reported in parentheses on the diagonal; $N = 372$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

interdependent self-construal, *Coeffs* = −0.02, *SE* = 0.01 to 0.03, 95% bias-corrected C.I. [−0.05 to −0.09, −0.0002 to 0.04]. These results indicate that the relationships between control, need for structure, and occupational stereotyping did not systematically vary as a function of interdependent self-construal. To further verify whether need for structure mediates the effect of control on occupational stereotyping (regardless of levels of interdependent self-construal), we tested another model with perceived control as the independent variable, need for structure as the mediator and occupational stereotyping as the dependent variable. We computed a 95% bias-corrected confidence interval around the indirect effect using a bootstrapping procedure with 5000 bootstrap resamples. The resulting bias-corrected confidence intervals did not include zero, indicating a significant indirect effect, *Coeff* = −0.02, *SE* = 0.007, 95% bias-corrected C.I. [−0.034, −0.005]. These results indicate that after accounting for personal need for structure, the relationship between personal control and occupational stereotyping was reduced, suggesting that personal need for structure mediates the link between perceived control and occupational stereotyping (Hypothesis 2, Fig. 5).

In sum, Study 3 generally supported the control-motivated account of stereotyping, using a context other than gender stereotyping. Lower control was associated with greater occupational stereotyping (Hypothesis 1), and the relation between control and occupational stereotyping was mediated by higher need for structure (Hypothesis 2).

However, unlike Studies 2a and 2b, this pattern was not moderated by interdependent self-construal. This could be due to two reasons. First, we might not have found a significant interaction effect due to sampling variability – indeed, the direction of the Control x Interdependent Self-construal interaction term was consistent with Studies 2a-2b. Second, unlike Studies 2a-2b where we manipulated control, we measured control in Study 3. Since Americans tend to have high levels of chronic personal control (Rothbaum, Weisz, & Snyder, 1982), there might not have been sufficient variability in control perceptions to produce a significant interaction effect.

Finally, in addition to the studies that we have discussed so far, we present in the supplementary materials two additional studies testing our hypotheses (Study S1 and S2). Study S1 examined the predictive power of perceived control in relation to other measures, such as right-wing authoritarianism (Altemeyer, 1998), death anxiety (Schimel et al., 1999), and uncertainty intolerance (Jost, Kruglanski, & Simon, 1999). Study S2 investigated the relationships between measures of control, need for structure, and gender stereotyping. Although we fully report these studies in the supplementary materials, we removed them from the primary text due to significant methodological limitations. For instance, Study S1 used a measure of gender stereotypes that was ostensibly more about attitudes (as opposed to beliefs), while Study S2 used a psychometrically weak single-item measure of control. Despite these limitations, however, we note that the patterns of results across these two supplementary studies are consistent with our predictions.

10. General discussion

Across four studies employing mixed methods, we tested the idea that people with lower personal control were more likely to stereotype. In cross-cultural, nationally representative samples, people with chronically lower levels of personal control were more likely to stereotype (Study 1). We also found that the relationship between control and stereotyping was moderated by country-level interdependent self-construal, such that these links were especially pronounced among countries with higher (vs. lower) mean levels of interdependent self-construal. In Study 2a, we conducted a comprehensive test of the relationships between interdependent self-construal, control, need for structure, and stereotyping. We found that people with low control were significantly more likely to endorse gender stereotypes. We replicated this model with a more established manipulation of control (Study 2b). Finally, in Study 3, we found that low control was again associated with greater need for structure, which then predicted greater occupational stereotyping. However, in this study, we did not find support for the moderating role of interdependent self-construal.

11. Theoretical implications

By positing a novel account of how control – a fundamental psychological need – relates to stereotyping, our work contributes to a better understanding of when and why people stereotype. We also contribute to *compensatory control theory* by highlighting the role of need for structure, a factor overlooked in prior work on control threat (e.g. Sullivan, Landau, & Rothschild, 2010). Demonstrating that control deprivation leads to a higher need for structure is important because structure-seeking is an integral mechanism by which compensatory control processes are hypothesized to occur (Landau et al., 2015). Relatedly, because previous research does not show that control motivation leads to greater need for structure, it can sometimes be unclear whether such effects are driven by general feelings of negativity (particularly if the dependent variables also capture negative attitudes, e.g., scapegoating).

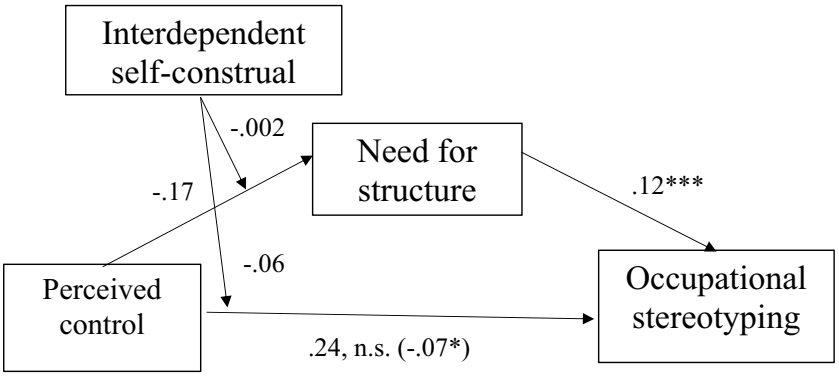

Fig. 4. Relationships between control, structure, interdependent self-construal and occupational stereotyping; Study 3. Values in parentheses represent the total effect of measured control on occupational stereotyping. Unstandardized coefficients. The coefficients of the control to need for structure and control to occupational stereotyping paths represent simple effects. The coefficient of the need for structure to occupational stereotyping path represents a main effect. Unstandardized coefficients. *$p < .05$ **$p < .01$ ***$p < .001$.

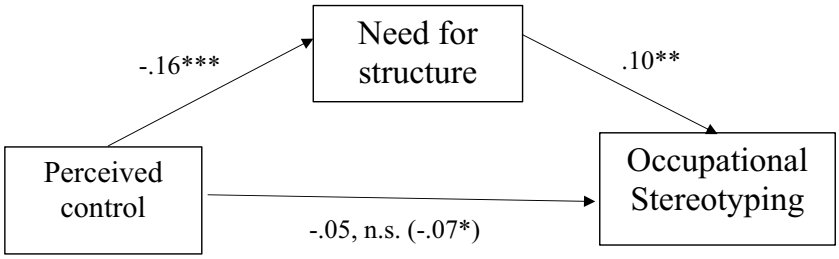

Fig. 5. Relationships between control, structure, interdependent self-construal and occupational stereotyping; Study 3. Values in parentheses represent the total effect of perceived control on occupational stereotyping. All coefficients represent main effects. Unstandardized coefficients. $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$.

In our data, we rule out negativity as an alternative explanation by showing that control deprivation also leads to positive stereotyping, and more importantly demonstrate that this link is also mediated by need for structure. Finally, little research has examined moderators of compensatory control processes (Landau et al., 2015). We address this gap in the literature by considering the moderating role of interdependent self-construal.

12. Limitations and future directions

One limitation of the present set of findings is the preliminary nature of our findings concerning the moderating role of interdependent self-construal. Generally (although see Study 3), we found more consistent support for the idea that people with interdependent self-construal are more likely to seek structure when lacking control than the idea that people with interdependent self-construal are more likely to employ social (as opposed to personal) psychological defenses. One potential reason for why this latter account was not consistently supported could be due to variable effects dependent on the relevance of certain stereotypes in navigating one's social environment. For instance, Kay and colleagues (2014) proposed and found that people seek structure because they want to regain their confidence to navigate their external reality. People with interdependent self-construal may then not find all social stereotypes equally useful in helping them navigate their social environments. For example, some stereotypes (e.g., stereotypes of STEM students, Cheryan, Siy, Vichayapai, Drury, & Kim, 2011) may be more helpful for certain groups of people (e.g., college students) than others. Some people may also work in male - (or female-) dominated environments and that could render stereotypes about one gender (relative to another) more useful. Future research could explore this question directly by examining whether differences in perceived usefulness or relevance of stereotype may moderate whether interdependent people endorse stereotypes when they desire structure.

Further, we found evidence that people with interdependent (vs. independent) self-construal are less likely to want to highlight the role of the self as a causal agent in coping with a loss of control. Consequently, when lacking control, people high in interdependence may opt to seek structure and stereotype (as opposed to bolster their personal agency directly). Individual differences in the chronic tendency to desire personal (vs. external) agency may be more directly captured by existing measures of desire for personal control and agency (Burger, 1989). If our rationale is true, then we should expect a similar moderation pattern to emerge. That is, people with a higher (vs. lower) desire for control should be less likely to seek structure and endorse stereotypes when lacking control, opting instead to directly bolster their own feelings of personal agency. Future research can test this possibility more directly.

In addition, across studies, effect sizes were relatively small (Cohen's $d = 0.15$ to 0.24). However, given that even small effects may have important societally large effects (Greenwald, Banaji, & Nosek, 2015), we think it is still meaningful to document the relationship between control and stereotyping, especially when this phenomenon appears robust across a large number of societies and over time.

We have also sought to differentiate our effects from the group-based control model and generally, we did not find that our effects were consistent with the group-based control striving account. For example, we did not consistently find that the relation between control and gender stereotyping was significantly moderated by participant's gender, and we also replicated the effects of control-motivated stereotyping within the context of occupational stereotyping (where there are no clear out- and ingroups). These results should not be interpreted, however, as suggesting group-based control effects do not occur. It is possible that we would observe that control threat leads men (vs. women) to be more likely to endorse positive communal women stereotypes if we had highlighted the existence of intergroup gender conflict prior to assessing stereotyping. For instance, when testing the effects of uncontrollable (vs. controllable) death on gender ingroup bias, Fritsche et al. (2008) highlighted conflict between gender groups prior to assessing ingroup bias and found that people who thought about uncontrollable (vs. controllable) death demonstrated greater ingroup bias.

Finally, the way we operationalized stereotyping in our study suggests that responses reflect stereotyping only to the extent that they match dominant cultural beliefs. For instance, in Studies 2a and 2b, we reverse coded agentic items (e.g., independent) so that higher agreement with these items suggested lower stereotyping of women, reflecting social consensus that women are not independent (Gill, 2004; Spence, Helmreich, & Stapp, 1974). Our decision to measure stereotyping in this way is consistent with the perspective that social consensus is needed for beliefs to qualify as stereotypes (Katz & Braly, 1933). However, there are other researchers who suggest that social consensus is not needed for individual beliefs to qualify as stereotypes (Ashmore & Del Boca, 1981; Judd & Park, 1993). In other words, if a person believes that women are more independent than men, their belief would be considered stereotypical according to the latter view, but not stereotypical according to the former (social consensus) view.

We chose to operationalize stereotyping as requiring social consensus for two reasons. First, some researchers have noted that stereotypes rooted in social consensus are perceived as more credible and factual seeming and have more “social support and a common source. Phenomenologically, they might well be seen not so much as beliefs but as facts” (p. 15, Gardner, 1993). In other words, stereotypes that have social consensus are more automatic and seem more credible, and thus might be especially attractive and appealing when people lack control and need simple, clear, explanations of their social environment. While it is also possible that idiosyncratic stereotypical beliefs also afford some predictability and control, these idiosyncratic beliefs may not afford as much certainty as stereotypes that have social consensus. Second, we believe that operationalizing stereotyping in a way that is consistent with previous research (e.g., Gill, 2004) may make it easier for future researchers to compare our effects with what other researchers have found. However, this topic would benefit from future research that examines if the effect of perceived control differs on stereotypes that have social consensus (versus those that are more idiosyncratic).

13. Conclusion

The present research offers a control-motivated account for stereotyping. We suggest that stereotyping fulfills people's need for structure, and may be especially appealing to those with interdependent self-construal. In so doing, we believe this research can contribute to a better understanding of when, why and to what end people stereotype others.

Open practices

We preregistered Study 2b and 3. The pre-registration of the materials and analyses for Study 2b can be found at https://osf.io/efsar/. The pre-registration of the materials and analyses for Study 3 can be found at https://osf.io/4cqd5/. We have included the data, questionnaires, and analysis syntax for all studies at https://osf.io/embpx/.

References

Alloy, L. B., & Abramson, L. Y. (1982). Learned helplessness, depression, and the illusion of control. *Journal of Personality and Social Psychology, 42*, 1114–1126.

Allport, G. W. (1954). *The nature of prejudice.* Reading, Mass: Addison-Wesley.

Altemeyer, B. (1998). The other "authoritarian personality". *Advances in Experimental Social Psychology, 30*, 47–92.

Ashmore, R. D., & Del Boca, F. K. (1981). Conceptual approaches to stereotypes and stereotyping. In D. L. Hamilton (Ed.). *Cognitive processes in stereotyping and intergroup behavior* (pp. 1–35). Hillsdale, NJ: Erlbaum.

Azuma, H. (1984). Secondary control as a heterogeneous category. *American Psychologist, 39*, 970–971.

Bar-Tal, Y., & Guinote, A. (2002). Who exhibits more stereotypical thinking? The effect of need and ability to achieve cognitive structure on stereotyping. *European Journal of Personality, 16*, 313–331.

Brewer, M. B., Dull, V., & Lui, L. (1981). Perceptions of the elderly: Stereotypes as prototypes. *Journal of Personality and Social Psychology, 41*, 656–670.

Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology, 56*, 246–256.

Burger, J. M. (1992). *Desire for control: Personality, social and clinical perspectives.* New York: Plenum Press.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116–131.

Chandler, J., Mueller, P., & Paolacci, G. (2014). Nonnaïveté among Amazon mechanical Turk workers: Consequences and solutions for behavioral researchers. *Behavior Research Methods, 46*(1), 112–130.

Cheng, C., Jose, P. E., Sheldon, K. M., Singelis, T. M., Cheung, M. W. L., & Sims, C. (2011). Sociocultural differences in self-construal and subjective well-being: A test of four cultural models. *Journal of Cross-Cultural Psychology, 42*, 832–855.

Cheryan, S., Siy, J. O., Vichayapai, M., Drury, B. J., & Kim, S. (2011). Do female and male role models who embody STEM stereotypes hinder women's anticipated success in STEM? *Social Psychological and Personality Science, 2*, 656–664.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155–159.

Cross, S. E., Bacon, P. L., & Morris, M. L. (2000). The relational-interdependent self-construal and relationships. *Journal of Personality and Social Psychology, 78*(4), 791–808.

Czopp, A. M., Kay, A. C., & Cheryan, S. (2015). Positive stereotypes are pervasive and powerful. *Perspectives on Psychological Science, 10*, 451–463.

Dennis, S. A., Goodson, B. M., & Pearson, C. (2018). MTurk Workers' use of low-cost 'Virtual private Servers' to circumvent screening methods: A research note. Available at SSRN https://ssrn.com/abstract=3233954.

Dovidio, J. F., Brigham, J. C., Johnson, B. T., & Gaertner, S. L. (1995). Stereotyping, prejudice, and discrimination: Another look. In N. Macrae, M. Hewstone, & C. Stangor (Eds.). *Foundations of stereotypes and stereotyping.* New York: Guilford.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.

Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology, 73*, 31–44.

Fiske, S. T. (1993). Controlling other people: The impact of power on stereotyping. *American Psychologist, 48*, 621–628.

Fiske, S. T. (2000). Stereotyping, prejudice, and discrimination at the seam between the centuries: Evolution, culture, mind, and brain. *European Journal of Social Psychology, 30*, 299–322.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd). NY: McGraw-Hill [16-15].

Friesen, J. P., Kay, A. C., Eibach, R. P., & Galinsky, A. D. (2014). Seeking structure in social organization: Compensatory control and the psychological advantages of hierarchy. *Journal of Personality and Social Psychology, 106*, 590–609.

Fritsche, I., Jonas, E., Ablasser, C., Beyer, M., Kuban, J., Manger, A. M., & Schultz, M. (2013). The power of we: Evidence for group-based control. *Journal of Experimental Social Psychology, 49*, 19–32.

Fritsche, I., Jonas, E., & Fankhänel, T. (2008). The role of control motivation in mortality salience effects on ingroup support and defense. *Journal of Personality and Social Psychology, 95*, 524–541.

Gardner, R. C. (1993). Stereotypes as consensual beliefs. In M. P. Zanna, & J. M. Olson (Vol. Eds.), *The psychology of prejudice: The Ontario symposium. Vol. 7. The psychology of prejudice: The Ontario symposium* (pp. 1–31). Hillsdale, NJ: Erlbaum.

Gill, M. J. (2004). When information does not deter stereotyping: Prescriptive stereotyping can foster bias under conditions that deter descriptive stereotyping. *Journal of Experimental Social Psychology, 40*, 619–632.

Glick, P., & Fiske, S. T. (1996). The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology, 70*, 491–512.

Greenwald, A. G., Banaji, M. R., & Nosek, B. A. (2015). Statistically small effects of the implicit association test can have societally large effects. *Journal of Personality and Social Psychology, 108*, 553–561.

Hall, J. A., & Carter, J. D. (1999). Gender-stereotype accuracy as an individual difference. *Journal of Personality and Social Psychology, 77*, 350–359.

Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research, 50*, 1–22.

Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology, 53*, 575–604.

Hox, J. J. (2010). *Multilevel analysis: Techniques and applications* (2nd ed.). New York, NY: Routledge.

Inesi, M. E., Botti, S., Dubois, D., Rucker, D. D., & Galinsky, A. D. (2011). Power and choice: Their dynamic interplay in quenching the thirst for personal control. *Psychological Science, 22*, 1042–1048.

Jonas, E., McGregor, I., Klackl, J., Agroskin, D., Fritsche, I., Holbrook, C., ... Quirin, M. (2014). Threat and defense: From anxiety to approach. *Advances in experimental social psychology. Vol. 49. Advances in experimental social psychology* (pp. 219–286). Academic Press.

Jost, J. T., & Banaji, M. R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology, 33*, 1–27.

Jost, J. T., Kruglanski, A. W., & Simon, L. (1999). Effects of epistemic motivation on conservatism, intolerance, and other system justifying attitudes. In L. Thompson, D. M. Messick, & J. M. Levine (Eds.). *Shared cognition in organizations: The management of knowledge* (pp. 91–116). Mahwah, NJ: Erlbaum.

Judd, C. M., & Park, B. (1993). Definition and assessment of accuracy in social stereotypes. *Psychological Review, 100*(1), 109–128.

Katz, D., & Braly, K. (1933). Racial stereotypes of one hundred college students. *The Journal of Abnormal and Social Psychology, 28*(3), 280–290.

Kay, A. C., Gaucher, D., McGregor, I., & Nash, K. (2010). Religious belief as compensatory control. *Personality and Social Psychology Review, 14*, 37–48.

Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the government: Testing a compensatory control mechanism for the support of external systems. *Journal of Personality and Social Psychology, 95*, 18–35.

Kay, A. C., Laurin, K., Fitzsimons, G. M., & Landau, M. J. (2014). A functional basis for structure-seeking: Exposure to structure promotes willingness to engage in motivated action. *Journal of Experimental Psychology: General, 143*, 486–491.

Kay, A. C., Shepherd, S., Blatz, C. W., Chua, S. N., & Galinsky, A. D. (2010). For god (or) country: The hydraulic relation between government instability and belief in religious sources of control. *Journal of Personality and Social Psychology, 99*, 725–739.

Kay, A. C., Sullivan, D., & Landau, M. J. (2014). Psychological importance of beliefs in control and order: Historical and contemporary perspectives in social and personality psychology. In E. Borgida, & J. Bargh (Vol. Eds.), *APA handbook of personality and social psychology: Attitudes and social cognition. vol. 1. APA handbook of personality and social psychology: Attitudes and social cognition* (pp. 309–337). Washington, DC: APA.

Kay, A. C., Whitson, J. A., Gaucher, D., & Galinsky, A. D. (2009). Compensatory control achieving order through the mind, our institutions, and the heavens. *Current Directions in Psychological Science, 18*, 264–268.

Kruglanski, A. W., Pierro, A., Mannetti, L., & De Grada, E. (2006). Groups as epistemic providers: Need for closure and the unfolding of group-centrism. *Psychological Review, 113*, 84–100.

Landau, M. J., Greenberg, J., Solomon, S., Pyszczynski, T., & Martens, A. (2006). Windows into nothingness: Terror management, meaninglessness, and negative reactions to modern art. *Journal of Personality and Social Psychology, 90*, 879–892.

Landau, M. J., Kay, A. C., & Whitson, J. A. (2015). Compensatory control and the appeal of a structured world. *Psychological Bulletin, 141*, 694–722.

Laurin, K., Kay, A. C., & Moscovitch, D. A. (2008). On the belief in god: Towards an understanding of the emotional substrates of compensatory control. *Journal of Experimental Social Psychology, 44*, 1559–1562.

Levy, S. R., Stroessner, S. J., & Dweck, C. S. (1998). Stereotype formation and endorsement: The role of implicit theories. *Journal of Personality and Social Psychology, 74*, 1421–1436.

Ma, A., & Kay, A. C. (2017). Compensatory control and ambiguity intolerance. *Organizational Behavior and Human Decision Processes, 140*, 46–61.

Ma, A., Landau, M. J., Narayanan, J., & Kay, A. C. (2017). Thought-control difficulty motivates structure seeking. *Journal of Experimental Psychology: General, 146*, 1067–1072.

Ma, A., Yang, Y., & Savani, K. (2019). "Take it or leave it!" A choice mindset leads to greater persistence and better outcomes in negotiations. *Organizational Behavior and Human Decision Processes, 153*, 1–12.

Marini, M., Sriram, N., Schnabel, K., Maliszewski, N., Devos, T., Ekehammar, B., & Schnall, S. (2013). Overweight people have low levels of implicit weight bias, but overweight nations have high levels of implicit weight bias. *PLoS One, 8*, e83543.

Morling, B., & Evered, S. (2006). Secondary control reviewed and defined. *Psychological Bulletin, 132*, 269–296.

Morton, T. A., Postmes, T., Haslam, S. A., & Hornsey, M. J. (2009). Theorizing gender in the face of social change: Is there anything essential about essentialism? *Journal of Personality and Social Psychology, 96*, 653–664.

Moskowitz, G. B. (1993). Individual differences in social categorization: The influence of personal need for structure on spontaneous trait inferences. *Journal of Personality and Social Psychology, 65*, 132–142.
Napier, J. L., Thorisdottir, H., & Jost, J. T. (2010). The joy of sexism? A multinational investigation of hostile and benevolent justifications for gender inequality and their relations to subjective well-being. *Sex Roles, 62*, 405–419.
Neuberg, S. L., & Fiske, S. T. (1987). Motivational influences on impression formation: Outcome dependency, accuracy-driven attention, and individuating processes. *Journal of Personality and Social Psychology, 53*, 431–444.
Neuberg, S. L., & Newsom, J. T. (1993). Personal need for structure: Individual differences in the desire for simpler structure. *Journal of Personality and Social Psychology, 65*, 113–131.
Newheiser, A. K., & Dovidio, J. F. (2012). Individual differences and intergroup bias: Divergent dynamics associated with prejudice and stereotyping. *Personality and Individual Differences, 53*, 70–74.
Pittman T.S. (1998) Motivation. In The handbook of social psychology, 4th edn, Vol. 1 Gilbert D.T., Fiske S.T., Lindzey G. (eds). McGraw-Hill: New York: 549 – 590.
Pittman, T. S., & D'Agostino, P. R. (1989). Motivation and cognition: Control deprivation and the nature of subsequent information processing. *Journal of Experimental Social Psychology, 25*, 465–480.
Presson, P. K., & Benassi, V. A. (1996). Illusion of control: A meta-analytic review. *Journal of Social Behavior & Personality, 11*, 493–510.
Richard, F. D., Bond, C. F., Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology, 7*, 331–363.
Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5–37.
Ruscher, J. B., & Fiske, S. T. (1990). Interpersonal competition can cause individuating processes. *Journal of Personality and Social Psychology, 58*, 832–843.
Sastry, J., & Ross, C. E. (1998). Asian ethnicity and the sense of personal control. *Social Psychology Quarterly,* 101–120.
Schaller, M., Boyd, C., Yohannes, J., & O'Brien, M. (1995). The prejudiced personality revisited: Personal need for structure and formation of erroneous group stereotypes. *Journal of Personality and Social Psychology, 68*, 544–555.
Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. *Journal of Personality and Social Psychology, 77*, 905–926.
Sedek, G., & Kofta, M. (1990). When cognitive exertion does not yield cognitive gain: Toward an informational explanation of learned helplessness. *Journal of Personality and Social Psychology, 58*, 729–743.
Seligman, M. E. (1975). *Helplessness: On depression, development, and death.* WH Freeman.
Shepherd, S., Kay, A. C., Landau, M. J., & Keefer, L. A. (2011). Evidence for the specificity of control motivations in worldview defense: Distinguishing compensatory control from uncertainty management and terror management processes. *Journal of Experimental Social Psychology, 47*, 949–958.
Sherman, J. W., Lee, A. Y., Bessenoff, G. R., & Frost, L. A. (1998). Stereotype efficiency reconsidered: Encoding flexibility under cognitive load. *Journal of Personality and Social Psychology, 75*, 589–606.
Sidanius, J., & Pratto, F. (2001). *Social dominance: An intergroup theory of social hierarchy and oppression.* Cambridge University Press.
Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science, 22*, 1359–1366.
Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin, 20*, 580–591.
Skinner, E. A. (1995). *Perceived control, motivation, & coping. Vol. 8*. Sage Publications.
Snibbe, A. C., & Markus, H. R. (2005). You can't always get what you want: Educational attainment, agency, and choice. *Journal of Personality and Social Psychology, 88*, 703–720.
Snyder, M., Tanke, E. D., & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Personality and Social Psychology, 35*, 656–666.
Spence, J. T, Helmreich, R. L., & Stapp, J. (1974). The personal attributes questionnaire: A measure of sex role stereotypes and masculinity-femininity. *JSAS Catalog of Selected Documents in Psychology, 4*, 1–42.
Sullivan, D., Landau, M. J., & Rothschild, Z. K. (2010). An existential function of enemyship: Evidence that people attribute influence to personal and political enemies to compensate for threats to control. *Journal of Personality and Social Psychology, 98*, 434–449.
Wang, C. S., Whitson, J. A., & Menon, T. (2012). Culture, control, and illusory pattern perception. *Social Psychological and Personality Science, 3*, 630–638.
Weber, R., & Crocker, J. (1983). Cognitive processes in the revision of stereotypic beliefs. *Journal of Personality and Social Psychology, 45*(5), 961–977.
Webster, D. M., & Kruglanski, A. W. (1997). Cognitive and social consequences of the need for cognitive closure. *European Review of Social Psychology, 8*, 133–173.
Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*, 5–13.
Whitson, J. A., & Galinsky, A. D. (2008). Lacking control increases illusory pattern perception. *Science, 322*, 115–117.