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Abstract

Despite their important implications for interpersonal behaviors and relations, cognitive abilities have been largely ignored as explanations of prejudice. We proposed and tested mediation models in which lower cognitive ability predicts greater prejudice, an effect mediated through the endorsement of right-wing ideologies (social conservatism, right-wing authoritarianism) and low levels of contact with out-groups. In an analysis of two large-scale, nationally representative United Kingdom data sets ($N = 15,874$), we found that lower general intelligence (g) in childhood predicts greater racism in adulthood, and this effect was largely mediated via conservative ideology. A secondary analysis of a U.S. data set confirmed a predictive effect of poor abstract-reasoning skills on antihomosexual prejudice, a relation partially mediated by both authoritarianism and low levels of intergroup contact. All analyses controlled for education and socioeconomic status. Our results suggest that cognitive abilities play a critical, albeit underappreciated, role in prejudice. Consequently, we recommend a heightened focus on cognitive ability in research on prejudice and a better integration of cognitive ability into prejudice models.

Keywords

cognitive ability, intelligence, right-wing ideology, contact, prejudice

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Cognitive abilities have important implications for interpersonal behaviors and relations. Studies have shown that individuals with lower levels of general intelligence (g) are less trusting of other people, less sensitive to interpersonal cues, and less accurate in deciphering other people's behaviors and intentions (Murphy & Hall, 2011; Sturgis, Read, & Allum, 2010). Our research builds on this emerging psychological literature and concerns the socially important but surprisingly underexamined relation between g and intergroup prejudice (i.e., negative evaluations of out-groups). In a targeted analysis, we evaluated whether (a) g (as a generalized cognitive ability) predicts out-group prejudice and (b) right-wing conservative ideologies and a lack of contact with out-groups mediate the link between cognitive ability and prejudice.

Since the mid-20th century, researchers have posited an association between g and prejudice (Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950; Allport, 1954), and early evidence suggested a negative correlation between intelligence and prejudice toward out-groups (Wagner & Schönbach, 1984). Recent studies have similarly reported negative correlations between scores on intelligence subscales and racism (Deary, Batty, & Gale, 2008; Schoon, Cheng, Gales, Batty, &

Deary, 2010) and between abstract reasoning and prejudice toward homosexuals (Keiller, 2010). However, rather than addressing the implications of mental *ability*, research on prejudice has focused overwhelmingly on motivational cognitive *styles* (e.g., Jost, Glaser, Kruglanski, & Sulloway, 2003), including intolerance of ambiguity and a preference for simple answers (see Van Hiel, Onraet, & De Pauw, 2010). Although research has revealed that the effects of cognitive style on prejudice are mediated by right-wing ideologies (e.g., Van Hiel, Pandelaere, & Duriez, 2004), empirical findings and theoretical accounts of whether (or how) cognitive ability contributes to prejudice are conspicuously absent from contemporary literature and textbooks on prejudice.

We propose that right-wing ideologies, which are socially conservative and authoritarian (see Jost et al., 2003; Van Hiel et al., 2010), represent a mechanism through which cognitive ability is linked with prejudice. According to contemporary

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theoretical approaches, such ideologies are characterized by resistance to change and the promotion of intergroup inequalities (Jost et al., 2003).¹ A recent comprehensive meta-analysis confirmed a reliable negative relation between cognitive ability and right-wing ideologies (Van Hiel et al., 2010). For example, research has revealed that individuals who more strongly endorse social conservatism have greater cognitive rigidity (Rokeach, 1948), less cognitive flexibility (Sidanius, 1985), and lower integrative complexity (Jost et al., 2003). Socially conservative individuals also perform less well than liberals on standardized ability tests (Stankov, 2009). Right-wing authoritarianism (Altemeyer, 1996), a strong correlate of social conservatism (Jost et al., 2003; Van Hiel et al., 2010), is also negatively associated with g (McCourt, Bouchard, Lykken, Tellegen, & Keyes, 1999).

Given that cognitive abilities are critical in forming individuated impressions of other people and in being open-minded (Scarr & Weinberg, 1981) and trusting of other people (Sturgis et al., 2010), individuals with lower cognitive abilities may gravitate toward more socially conservative right-wing ideologies that maintain the status quo and provide psychological stability and a sense of order (Jost et al., 2003). This rationale is consistent with findings that less intelligent children come to endorse more socially conservative ideologies as adults (Deary et al., 2008; Schoon et al., 2010).

Furthermore, compared with liberals, individuals who endorse right-wing ideologies are more fearful and anxious that out-groups will cause the disintegration of societal moral standards and traditions (Altemeyer, 1996; Jost et al., 2003; Sibley & Duckitt, 2008). Consistent with this apprehension is the well-established relation between right-wing ideologies and attitudes toward out-groups, whereby both conservatism (Van Hiel et al., 2004) and authoritarianism (Altemeyer, 1996; Hodson & Costello, 2007; Sibley & Duckitt, 2008) are associated with heightened prejudice. Recent meta-analyses have confirmed that there are strong positive correlations between right-wing ideologies and prejudice (see Sibley & Duckitt, 2008). However, the endorsement of right-wing ideologies is not synonymous with prejudice against out-groups (Sniderman & Tetlock, 1986). According to social-dominance theory, the positive association between right-wing ideologies and negative evaluations of out-groups reflects the fact that both constructs share the core psychological element of a desire for hierarchies among groups (Sidanius, Pratto, & Bobo, 1996). Socially conservative ideologies have therefore been conceptualized as “legitimizing myths”: Although they are often rooted in socially acceptable values and traditions, such ideologies nonetheless facilitate negative attitudes toward out-groups (Sidanius & Pratto, 1999; see also Jost et al., 2003; Sidanius et al., 1996; Van Hiel et al., 2010).

Together, the well-established theoretical and empirical links between lower g and greater right-wing ideology and between greater right-wing ideology and heightened prejudice suggest a mediating mechanism (Baron & Kenny, 1986) by which lower g may be associated with greater prejudice. We propose a model (see Fig. 1) in which lower g predicts greater

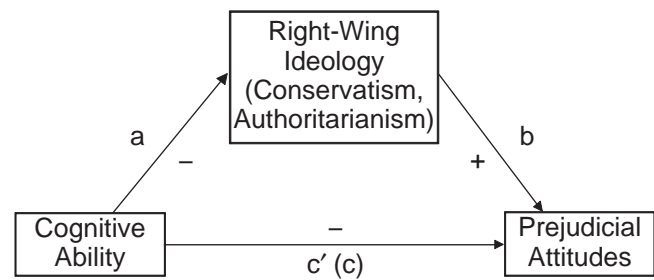


Fig. 1. Hypothesized mediation model showing the relation between cognitive ability and prejudicial attitudes as mediated by right-wing ideology. Path a represents the negative effect of general intelligence (g) on right-wing ideology, Path b represents the positive effect of right-wing ideology on prejudicial attitudes, Path c represents the negative direct effect of general intelligence (g) on prejudice, and Path c' represents the effect of g on prejudice after controlling for the mediator.

right-wing ideology (Path a) and greater right-wing ideology predicts more prejudicial attitudes (Path b). Furthermore, although we expected that lower g itself predicts greater prejudice (Path c), we hypothesized that this association is facilitated in large part by right-wing ideology (i.e., through Path a and Path b). Therefore, we expected that if right-wing ideology (i.e., the mediator) is included in the predictive model, the anticipated negative direct effect between g and prejudice (Path c) will be substantially attenuated or statistically non-significant; such a finding would support a significant negative indirect effect (the product of Paths a and b; Shrout & Bolger, 2002). Thus, individuals with lower cognitive ability may be more attracted to right-wing ideologies that promote coherence and order, and because such ideologies emphasize the maintenance of the status quo, they may foster greater out-group prejudice.

Although a review of the literature reveals meta-analytic evidence supporting a relation between lower g and greater endorsement of right-wing ideologies (Van Hiel et al., 2010) and a relation between right-wing ideology and prejudice (Sibley & Duckitt, 2008), considerably less is known about the relation between g and prejudice. No empirical tests of the indirect effect of generalized cognitive ability on prejudice through specific mediators have yet been conducted. Researchers who have examined the links among cognitive ability, ideology, and racism (Deary et al., 2008; Schoon et al., 2010) have treated racism and socially conservative ideology as manifestations of a single underlying construct (“conservative ideology”) and have assessed whether g predicts a latent factor representing the variance shared between racism and ideology. Such an approach treats conservative ideology and racism as more equivalent than they are assumed to be by contemporary theorizing or have been shown to be by contemporary research on intergroup relations (Sidanius et al., 1996; Sniderman & Tetlock, 1986), both of which typically treat ideologies and prejudices as separate constructs (e.g., Sibley & Duckitt, 2008; Sidanius et al., 1996). Previous approaches have also overlooked any potential direct relation between g (as a generalized measure of mental ability) and racism. In contrast, our

investigation concerned whether *g* is related to prejudice and whether *g* might negatively influence attitudes toward out-groups through right-wing ideologies—an influence that would be consistent with social-dominance theory (Sidanius & Pratto, 1999) and other contemporary theories of prejudice (e.g., Sibley & Duckitt, 2008).

We first evaluated the anticipated negative relation between *g* and prejudice in two United Kingdom (U.K.) samples and determined whether this association was explained by socially conservative ideology. Next, we assessed the hypothesized negative relation between *g* and prejudice in an American sample and tested whether authoritarianism and intergroup contact could independently explain this relation.

Longitudinal Data From Two Nationally Representative U.K. Samples

We first examined data from longitudinal studies measuring intelligence in childhood and conservative ideology and generalized racism in adulthood. Because social-political attitudes typically emerge in late adolescence and early adulthood (Altemeyer, 1996; Sibley & Duckitt, 2008), considering childhood intelligence as a theoretical predictor of subsequent adult racism represents an important step in evaluating whether low *g* during childhood sets the stage for the development of adult prejudice.

Participants and measures

We used two large-scale U.K. data sets to test our hypothesized mediation model: the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS). In the NCDS, all participants (4,267 men and 4,537 women) were born in the same week in March 1958; in the BCS, all participants (3,412 men and 3,658 women) were born in the same week in April 1970. Cognitive abilities were assessed with standardized measures when NCDS participants were 11 years old and BCS participants were 10 years old, and socially conservative ideology and racism were assessed at ages 33 and 30, respectively. In both studies, thousands of men and women completed relevant measures; both data sets are regarded as excellent sources of representative data (see Deary et al., 2008).

Cognitive abilities. The NCDS included two measures of intelligence: verbal intelligence (similarities between words; 40 items) and nonverbal intelligence (similarities between shapes or symbols; 40 items; Douglas, 1964). The BCS included four measures of cognitive abilities (following Elliot, Murray, & Pearson, 1978): matrix abilities (drawing missing aspects of shapes; 28 items), digit recall (recalling digits from number series; 34 items), word definitions (identifying the meanings of words; 37 items), and word similarities (generating words that are semantically consistent with presented words; 42 items).

Social conservatism. In both the NCDS and the BCS, socially conservative ideology was assessed in terms of respect for and submission to authority (7 items in the NCDS and 10 items in the BCS; e.g., “Give law breakers stiffer sentences” and “Schools should teach children to obey authority”) and support for conventional (i.e., unequal) sex roles (6 items in both studies; e.g., “Family life suffers if mum is working full-time”); scale reliabilities ranged from .63 to .68 (Deary et al., 2008; Schoon et al., 2010). These measures tap socially conservative values, including desire for law and order, punitive reactions toward wrongdoers, adherence to social conventions or traditions, and social control. Without reference to racial out-groups, these items reflect ideological orientations rooted in resistance to change and a desire to maintain existing social stratifications, making them ideal for our purposes.

Racism. Attitudes toward racial out-groups were assessed in the NCDS and the BCS with the same five items (e.g., “I wouldn’t mind working with people from other races” and “I wouldn’t mind if a family of a different race moved next door”; $s = .82$; Deary et al., 2008; Schoon et al., 2010). Items were reverse-scored; higher scores indicate a generalized antipathy toward racial out-groups, rather than antipathy toward a specific racial group.

Covariates. Parental socioeconomic status for participants during childhood, as well as participants’ personal socioeconomic status and education level in adulthood, were obtained in both the NCDS and the BCS. Parental and personal socioeconomic status were rated on 4-point (BCS) and 6-point (NCDS) scales based on social prestige of occupation. If a participant’s father was unemployed, the mother’s occupation was utilized; unemployed participants reported their most recent employment status. In both studies, participants’ level of education was rated on a 6-point scale ranging from 0, *no education*, to 5, *postgraduate*.

Data analysis

We used AMOS software (Arbuckle, 2006) to test the hypothesized mediation model separately for men and women in each data set, using correlation matrices reported by Deary et al. (2008) and Schoon et al. (2010). (Note that the means and standard deviations for each study are provided in these reports.) We modeled the measures of cognitive ability as indicators of a latent *g* factor (see Deary et al., 2008; Schoon et al., 2010) and the measures of conservatism as indicators of a latent conservative-ideology factor. Directional paths were estimated between the latent *g* factor and the latent conservative-ideology factor (Path a in Fig. 1), between the latent conservative-ideology factor and the measure of racism (Path b), and between the latent *g* factor and the measure of racism (Paths c and c’). To statistically identify the latent factors, we fixed the variance on the latent *g* factor and the residual variance on the latent conservative-ideology factor at 1; loadings on

each latent factor were freely estimated. To account for the potentially confounding effects of socioeconomic status, we specified all three covariates both as correlates of the latent g factor and as predictors of latent ideology and racism. Parameter estimates and significance tests were based on bias-corrected estimates derived from 1,000 bootstrap samples (see Shrout & Bolger, 2002).

Results and discussion

Results from both the NCDS and the BCS supported each component of the hypothesized mediation model (see Table 1). For both men and women, the NCDS data demonstrated significant negative paths from the latent g factor in childhood to the latent conservative-ideology factor in adulthood (Path a) and significant positive paths from the latent conservative-ideology factor to generalized racism in adulthood (Path b). As predicted, without the hypothesized mediator in the model, the direct effect of the latent g factor in childhood on adult racism (Path c) was negative and significant, but this effect was attenuated in magnitude and reduced to nonsignificance (Path c') when the latent conservative-ideology factor was included. Of the total predictive effect of childhood cognitive ability on adult racism, between 92% and 100% was indirect, mediated via conservative ideology (see Table 2).

The BCS data set revealed a virtually identical pattern for men: Conservative ideology fully mediated the negative effect of childhood cognitive ability on adult racism. Among women, conservative ideology mediated the effect of childhood cognitive ability on adult racism significantly but only partially, with the direct effect of childhood cognitive ability on adult racism remaining significant (see Table 1). For longitudinal path models showing all estimated parameters, see the Supplemental Material available online.

These results from large, nationally representative data sets provide converging evidence that lower g in childhood predicts greater prejudice in adulthood and, furthermore, that socially conservative ideology mediates much of this effect. Our model tests are particularly compelling because in both the NCDS and the BCS, the measurement of childhood intelligence preceded the assessment of adulthood prejudice by at least two decades. Moreover, all predictive effects were independent of socioeconomic status and education.

Laboratory Evidence From a U.S. Sample

Does the pattern observed in the two U.K. samples generalize to other cultures with their own distinct political values? In a report of a recent American study, Keiller (2010) argued that the capacity for abstract (as opposed to concrete) thinking should facilitate comprehension of other people and the complex mental processing required for the interpretation of relatively novel information (i.e., the type of information encountered during intergroup contact). For instance, adopting another person's perspective requires advanced cognitive processing, abstraction, and interpretation, particularly when the target is an out-group member (and thus "different"). Given that perspective taking reduces prejudice (Hodson, Choma, & Costello, 2009), stronger mental capabilities may facilitate smoother intergroup interactions. Consistent with this rationale is Keiller's finding that abstract reasoning negatively predicted prejudice against homosexuals. Although his objective did not involve explaining why lower cognitive ability predicts greater prejudice, Keiller's report provides all the necessary data, collected in a controlled laboratory setting from an American sample, with which to test such possibilities. The participants in this U.S. sample had equivalent levels of education; potential differences in cognitive

Table 1. Results of the Mediation Model of the Effects of Childhood Cognitive Ability on Prejudice in Adulthood as Mediated by Right-Wing Ideology

Analysis	Mediation-model path			
	Path a	Path b	Path c	Path c'
National Child Development Study—men ($n = 4,267$)	-0.15***	0.69***	-0.11**	-0.01
National Child Development Study—women ($n = 4,537$)	-0.18***	0.51***	-0.07**	0.02
1970 British Cohort Study—men ($n = 3,412$)	-0.40***	0.41***	-0.17***	-0.01
1970 British Cohort Study—women ($n = 3,658$)	-0.33***	0.31***	-0.25***	-0.15*

Note: Standardized regression coefficients are shown. Path a represents the relation between general intelligence (g) and right-wing ideology; Path b represents the relation between right-wing ideology and prejudice; Path c represents the direct path between g and prejudice; and Path c' represents the relation between g and prejudice as mediated by right-wing ideology. All analyses controlled for education and socioeconomic status.

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

Table 2. Decomposition of the Effects in the Mediation Model in Table 1

Analysis and predictor	Correlation (<i>r</i>) with prejudice	Total effect (β)	Direct effect (β)	Indirect effect (β)	Percentage of effect that is indirect
National Child Development Study—men (<i>n</i> = 4,267)					
Latent <i>g</i>	-.19***	-0.11**	-0.01	-0.11**	92
Latent conservatism	.65***	0.69**	0.69**	—	—
National Child Development Study—women (<i>n</i> = 4,537)					
Latent <i>g</i>	-.17***	-0.07**	0.02	-0.09***	100
Latent conservatism	.51***	0.51**	0.51**	—	—
1970 British Cohort Study—men (<i>n</i> = 3,412)					
Latent <i>g</i>	-.24***	-0.17**	-0.01	-0.16**	92
Latent conservatism	.43***	0.41**	0.41**	—	—
1970 British Cohort Study— women (<i>n</i> = 3,658)					
Latent <i>g</i>	-.29***	-0.25**	-0.15**	-0.10**	41
Latent conservatism	.39***	0.31**	0.31**	—	—

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

ability or prejudice due to education were thus empirically controlled for.

Our analysis of Keiller's (2010) data set allowed us to extend our model in several important ways. Specifically, Keiller's study tapped a different cognitive ability (abstract reasoning), a different but related measure of right-wing ideology (right-wing authoritarianism), and attitudes toward a specific out-group (homosexuals) rather than generalized racist attitudes. Furthermore, the study measured an additional potential mediator of the relation between cognitive ability and prejudice: *intergroup contact*. Both experimental and longitudinal studies have demonstrated that greater contact with out-groups predicts lower prejudice (Pettigrew & Tropp, 2006); these findings have distinguished such contact as a particularly valuable prejudice-reduction tool (Hodson, 2011). However, because intergroup contact is cognitively demanding (Richeson & Shelton, 2003), it may be avoided by individuals with lower cognitive abilities and approached by individuals with stronger cognitive abilities. Furthermore, given that intergroup contact predicts favorable attitudes toward out-groups independently of personal ideology (Hodson, Harry, & Mitchell, 2009), it is possible that such contact uniquely mediates the relation between cognitive ability and prejudice and that this relation is independent of mediation effects through right-wing ideology. We therefore undertook a secondary analysis of Keiller's (2010) findings to test the generalizability of our hypothesized mediation model with respect to different measurements of cognitive ability, right-wing ideology, and prejudice in the context of a different political culture, and to explore an additional mediating mechanism.

Participants and measures

Undergraduates (172 women, 82 men) from an American university completed a 21-item scale assessing prejudice against homosexuals (Kite & Deaux, 1986), indicated the number of homosexuals they knew personally, and completed a 20-item right-wing-authoritarianism scale that tapped submission to authority, conventionality, and aggression against deviants (Altemeyer, 1996). Abstract reasoning was measured with 12 of the most cognitively challenging items from the Inventory of Piaget's Developmental Tasks (Furth, 1970).

Data analysis

We undertook a secondary analysis of Keiller's (2010) data using his reported correlation matrix and descriptive statistics. Path analysis was employed to test a mediation model in which greater abstract reasoning predicted antihomosexual prejudice and in which both right-wing authoritarianism and intergroup contact were specified as correlated mediators (see Fig. 2). We hypothesized that lower cognitive ability would predict greater antihomosexual prejudice, greater right-wing authoritarianism, and less intergroup contact, and that these latter two variables, respectively, would be positively and negatively related to antihomosexual prejudice. Because people who endorse right-wing authoritarianism avoid intergroup contact, and because such avoidance promotes authoritarianism (Hodson, 2011), the mediators were set to covary. Predictive effects and associated *p* values were bias-corrected estimates derived from 1,000 bootstrap samples (see Shrout & Bolger, 2002).

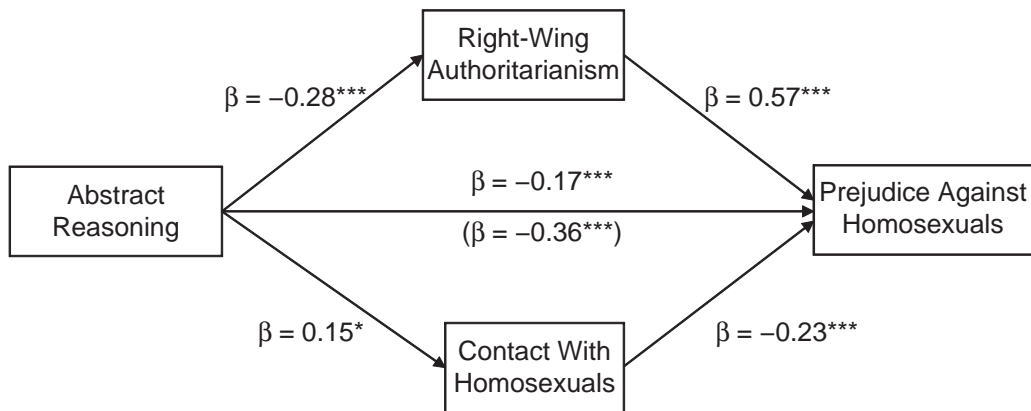


Fig. 2. Mediation model showing the relation between abstract reasoning and antihomosexual prejudice as mediated through right-wing authoritarianism and out-group contact (data from Keiller, 2010). Standardized path coefficients are shown; the parenthetical value represents the zero-order effect. Asterisks indicate significant coefficients (* $p < .05$; *** $p < .001$). The correlation between the mediators was $-.28$, $p < .001$.

Results and discussion

Our results confirmed each component of the predicted model (see Fig. 2). Abstract reasoning negatively predicted prejudice, but this effect was significantly reduced when we included the mediators in the model. Lower levels of abstract reasoning also predicted greater right-wing authoritarianism, which in turn predicted elevated prejudice against homosexuals. Independent of these effects, there was a simultaneous indirect effect through increased intergroup contact: Individuals who had a greater capacity for abstract reasoning experienced more contact with out-groups, and more contact predicted less prejudice. The standardized total effect of abstract reasoning on prejudice was $-.36$. The standardized indirect effect ($-.20$; not shown in the figure) through the simultaneously examined mediators was significant ($p < .01$), and accounted for 55% of the relation between abstract-reasoning ability and negative evaluations of homosexuals (44% via right-wing authoritarianism, 11% via intergroup contact).

Results from our analysis were consistent with results from our analysis of the NCDS and the BCS: The hypothesized mediation of the effect of cognitive abilities on prejudice was supported by data from a sample in a different country, in a study tapping alternative indicators of cognitive ability and right-wing ideology—abstract reasoning and right-wing authoritarianism, respectively—and examining prejudice toward a specific out-group rather than prejudice against out-groups in general. Furthermore, our analysis of this U.S. sample uncovered an additional, previously unexamined mediator of the relation between intelligence and prejudice: intergroup contact.

General Discussion

The link between intelligence and prejudice has been little researched and scarcely features in theoretical or empirical

accounts of intergroup evaluations. Our synthesis demonstrates that cognitive ability plays a substantial role not only in predicting prejudice, but also in predicting its potential precursors: right-wing ideologies and authoritarian value systems, which can perpetuate social inequality by emphasizing the maintenance of the status quo, and a lack of contact and experience with out-groups. Our analysis of two large-scale U.K. data sets established a predictive relation between childhood g (a latent factor of generalized intelligence) and adult prejudice, as well as an indirect effect of g on prejudice via conservative ideology; this indirect effect explained more than 90% of the relation between g and racism in three of the four analyses (see Table 2). Thus, conservative ideology represents a critical pathway through which childhood intelligence predicts racism in adulthood. In psychological terms, the relation between g and prejudice may stem from the propensity of individuals with lower cognitive ability to endorse more right-wing conservative ideologies because such ideologies offer a psychological sense of stability and order. By emphasizing resistance to change and inequality among groups, these ideologies legitimize and promote negative evaluations of out-groups.

Our findings contribute to the literature in several ways. Whereas other research has emphasized how education influences prejudice through cognitive ability (Wagner & Schönbach, 1984), or whether links between conservative ideology and prejudice are stronger in samples of more educated people than they are in samples of less educated people (Sidanius et al., 1996), our longitudinal analyses refine the understanding of these processes by demonstrating that childhood g predicts racism in adulthood independently of education and socioeconomic status. In our study, we diverged from previous approaches by addressing the novel question of why lower g predicts more negative evaluations of out-groups and by providing evidence of multiple, simultaneous mediators (ideology and intergroup contact). By controlling for participants'

level of education, we avoided a potential confound that troubled researchers who initially posed this intriguing question (Adorno et al., 1950; Allport, 1954).

The importance of our findings is best illustrated by considering them within a broader context. Our longitudinal analyses revealed a modest but reliable relation between g and prejudice, even when we controlled for covariates. The magnitude of this relation is comparable to relations found between stereotype endorsement (e.g., characterizing groups as “lazy” or “aggressive”) and prejudice ($r = .25$; Dovidio, Brigham, Johnson, & Gaertner, 1996) and between intergroup contact and prejudice ($r = -.21$, Pettigrew & Tropp, 2006), and the g -prejudice relation appears to be independent of this latter effect. When the effects are expressed as a binomial effect size display, the implications are compelling: In the BCS, 62% of boys and 65% of girls whose level of intelligence was below the median at age 10 expressed above-median levels of racism during adulthood. Conversely, only 35% to 38% of the children with above-median levels of intelligence exhibited racist attitudes as adults. Keiller’s (2010) cross-sectional data revealed a similarly impressive binomial effect: Sixty-eight percent of individuals whose abstract-reasoning scores were below the median scored above the median on measures of antihomosexual bias. The magnitudes of these effects strongly suggest that cognitive ability plays a meaningful role in the expression of prejudice.

A reliable explanation of this effect of g on prejudice contributes considerably to the understanding of prejudice.² Our research is the first to demonstrate that intelligence may exert a considerable influence on prejudice through right-wing ideologies, which promote the maintenance of the status quo and hierarchies among groups, and also through low levels of contact with out-groups. Clearly, however, all socially conservative people are not prejudiced, and all prejudiced persons are not conservative. We therefore differentiated our approach from that of earlier researchers who treated prejudicial attitudes and ideology as manifestations of conservatism (Deary et al., 2008; Schoon et al., 2010). By contrast, in keeping with contemporary intergroup theories, such as social-dominance theory, we deliberately disentangled conservative ideology from prejudice. We recognize that although conservative ideologies often contribute to negative attitudes or behavior toward out-groups (Altemeyer, 1996; Sidanius & Pratto, 1999), conservative ideologies or value systems are not necessarily characterized by prejudice, and social conservatives do not “value” negative evaluations of out-groups. Instead, conservative ideologies contribute to negative out-group evaluations. Not only do cognitive abilities predict each of these constructs, but our analyses reveal that right-wing ideologies and contact with out-groups go a long way in explaining the relation between mental ability and prejudice.

Of course, prejudice cannot be explained solely by intelligence, ideology, or intergroup contact. Prejudice has complex origins, including personal factors, such as ignorance and a

lack of empathy (Pettigrew & Tropp, 2008), and social factors, such as resource competition and intergroup hierarchies (Sidanius & Pratto, 1999). Yet some factors, such as the ability to adopt alternative perspectives, might be driven by mental capacity, given that contact with out-groups is mentally demanding (Richeson & Shelton, 2003). If so, the efficacy of innovative interventions against prejudice, such as imagined intergroup contact (Crisp & Turner, 2009), may have unrealized boundary conditions imposed by cognitive ability. Thus, to complement the tremendous progress made by exploring motivational factors and cognitive styles (Jost et al., 2003), researchers studying prejudice should begin directing serious attention toward cognitive abilities (Van Hiel et al., 2010).

Although the study of individual differences that contribute to prejudice is currently enjoying a renaissance, this renewed interest is unfolding at a time when cognitive factors have taken a backseat to emotion-based predictors of prejudice (Pettigrew & Tropp, 2008). However, basic categorization processes and the subsequent mental activation and application of stereotypes remain undeniably important cognitive factors in determining outcomes in intergroup contexts. Therefore, cognitive *abilities*, particularly in relation to ideology, need to become increasingly focal to and integrated into existing literatures. The joint examination of mental abilities, emotions, and motivations would provide a rich framework for understanding how prejudice and social-cultural ideologies develop in individuals. Models explaining the relations among g , cognitive styles (e.g., need for closure), ideology, and prejudicial attitudes, ideally across multiple time points, are particularly needed to fully identify the processes by which ideology and prejudice develop and the temporal ordering of such processes.

In conclusion, our investigation establishes that cognitive ability is a reliable predictor of prejudice. Understanding the causes of intergroup bias is the first step toward ultimately addressing social inequalities and negativity toward out-groups. Exposing right-wing conservative ideology and intergroup contact as mechanisms through which personal intelligence may influence prejudice represents a fundamental advance in developing such an understanding.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Supplemental Material

Additional supporting information may be found at <http://pss.sagepub.com/content/by/supplemental-data>

Notes

1. We focused on social-cultural conservatism rather than economic conservatism, given that the former is more clearly related to prejudice (Jost et al., 2003; Van Hiel et al., 2010).
2. Although Jackman (1973) has reasoned that mentally sophisticated people might be better able to avoid appearing prejudiced,

research does not support this position (e.g., Ostapczuk, Musch, & Moshagen, 2009; Wagner & Zick, 1995). Moreover, this supposition hinges on the unsupported assumption that understanding and complying with contemporary social norms against prejudice when responding to straightforward questions about racial preferences requires elaborate cognitive skills of the sort that differentiate people with lower mental abilities from people with higher mental abilities. This alternative explanation seems unlikely, particularly in samples of university students (e.g., Keiller, 2010).

References

- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). *The authoritarian personality*. New York, NY: Harper.
- Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.
- Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Arbuckle, J. L. (2006). Amos (Version 18.0) [Computer software]. Chicago, IL: SPSS.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Crisp, R. J., & Turner, R. N. (2009). Can imagined interactions produce positive perceptions? Reducing prejudice through simulated social contact. *American Psychologist, 64*, 231–240.
- Deary, I. J., Batty, G. D., & Gale, C. R. (2008). Bright children become enlightened adults. *Psychological Science, 19*, 1–6.
- Douglas, J. W. B. (1964). *The home and the school*. London, England: Panther Books.
- Dovidio, J. F., Brigham, J. C., Johnson, B. T., & Gaertner, S. L. (1996). Stereotyping, prejudice, and discrimination: Another look. In C. N. Macrae, C. Stangor, & M. Hewstone (Eds.), *Stereotypes and stereotyping* (pp. 276–319). New York, NY: Guilford Press.
- Elliot, C., Murray, D., & Pearson, L. (1978). *British ability scales*. Windsor, England: National Foundation for Educational Research.
- Furth, H. (1970). *An inventory of Piaget's developmental tasks*. Washington, DC: Catholic University, Department of Psychology, Center for Research in Thinking and Language.
- Hodson, G. (2011). Do ideologically intolerant people benefit from intergroup contact? *Current Directions in Psychological Science, 20*, 154–159.
- Hodson, G., Choma, B. L., & Costello, K. (2009). Experiencing Alien-Nation: Effects of a simulation intervention on attitudes toward homosexuals. *Journal of Experimental Social Psychology, 45*, 974–978.
- Hodson, G., & Costello, K. (2007). Interpersonal disgust, ideological orientations, and dehumanization as predictors of intergroup attitudes. *Psychological Science, 18*, 691–698.
- Hodson, G., Harry, H., & Mitchell, A. (2009). Independent benefits of contact and friendship on attitudes toward homosexuals among authoritarians and highly identified heterosexuals. *European Journal of Social Psychology, 35*, 509–525.
- Jackman, M. (1973). Education and prejudice or education and response-set? *American Sociological Review, 38*, 327–339.
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin, 129*, 339–375.
- Keiller, S. W. (2010). Abstract reasoning as a predictor of attitudes toward gay men. *Journal of Homosexuality, 57*, 914–927.
- Kite, M. E., & Deaux, K. (1986). Attitudes toward homosexuality: Assessment and behavioral consequences. *Basic and Applied Social Psychology, 7*, 137–162.
- McCourt, K., Bouchard, T. J., Lykken, D. T., Tellegen, A., & Keyes, M. (1999). Authoritarianism revisited: Genetic and environmental influences examined in twins reared apart and together. *Personality and Individual Differences, 27*, 985–1014.
- Murphy, N. A., & Hall, J. A. (2011). Intelligence and interpersonal sensitivity: A meta-analysis. *Intelligence, 39*, 54–63.
- Ostapczuk, M., Musch, J., & Moshagen, M. (2009). A randomized-response investigation of the education effect in attitudes toward foreigners. *European Journal of Social Psychology, 39*, 920–931.
- Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology, 90*, 751–783.
- Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology, 38*, 922–934.
- Richeson, J. A., & Shelton, J. N. (2003). When prejudice does not pay: Effects of interracial contact on executive function. *Psychological Science, 14*, 287–290.
- Rokeach, M. (1948). Generalized mental rigidity as a factor in ethnocentrism. *Journal of Abnormal and Social Psychology, 43*, 259–277.
- Scarr, S., & Weinberg, R. A. (1981). The transmission of authoritarianism in families: Genetic resemblance in social-political attitudes? In S. Scarr (Ed.), *Race, social class, and individual differences* (pp. 399–427). Hillsdale, NJ: Erlbaum.
- Schoon, I., Cheng, G., Gales, C. R., Batty, G. D., & Deary, I. J. (2010). Social status, cognitive ability, and educational attainment as predictors of liberal social status and political trust. *Intelligence, 38*, 144–150.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 442–445.
- Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*, 248–279.
- Sidanius, J. (1985). Cognitive functioning and sociopolitical ideology revisited. *Political Psychology, 6*, 637–661.
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge, England: Cambridge University Press.
- Sidanius, J., Pratto, F., & Bobo, L. (1996). Racism, conservatism, affirmative action, and intellectual sophistication: A matter of principled conservatism or group dominance? *Journal of Personality and Social Psychology, 70*, 476–490.

- Sniderman, P., & Tetlock, P. E. (1986). Symbolic racism: Problems of motive attribution in political analysis. *Journal of Social Issues, 42*, 129–150.
- Stankov, L. (2009). Conservatism and cognitive ability. *Intelligence, 37*, 294–304.
- Sturgis, P., Read, S., & Allum, N. (2010). Does intelligence foster generalized trust? An empirical test using the UK birth cohort studies. *Intelligence, 38*, 45–54.
- Van Hiel, A., Onraet, E., & De Pauw, S. (2010). The relationship between social-cultural attitudes and behavioral measures of cognitive style: A meta-analytic integration of studies. *Journal of Personality, 78*, 1765–1799.
- Van Hiel, A., Pandelaere, M., & Duriez, B. (2004). The impact of need for closure on conservative beliefs and racism: Differential mediation by authoritarian submission and authoritarian dominance. *Personality and Social Psychology Bulletin, 30*, 824–837.
- Wagner, U., & Schönbach, P. (1984). Links between educational status and prejudice: Ethnic attitudes in West Germany. In M. B. Brewer & N. Miller (Eds.), *Groups in contact: The psychology of desegregation* (pp. 29–52). New York, NY: Academic Press.
- Wagner, U., & Zick, A. (1995). The relation of formal education to ethnic prejudice: Its reliability, validity, and explanation. *European Journal of Social Psychology, 25*, 41–56.