



Is there a relationship between political orientation and cognitive ability? A test of three hypotheses in two studies

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ABSTRACT

Two studies tested one linear and two curvilinear hypotheses concerning the relationship between political conservatism-liberalism and cognitive ability. Study 1, focusing on students at a selective US university ($n = 7279$), found support for the idea that some dimensions of conservatism are linked to lower verbal ability, whereas other dimensions are linked to higher verbal ability. There was also strong support for political extremists both on the left and right being higher in verbal ability than centrists. Study 2 employed aggregate data pertaining to the 50 US states and demonstrated that conservatism was linked to lower cognitive ability in states with high political involvement, but found conservatism to be correlated with higher average ability in states with low political involvement. The discussion addresses potential implications and criticisms of this research.

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1. Introduction

The present research examines the hypothesis that an individual's location on the liberal-conservative dimension is related to an individual's cognitive resources. Prominently, Adorno, Frenkel-Brunswick, Levinson, and Sanford (1950) linked endorsing right-wing ideology to lower levels of cognitive functioning. These and subsequent authors found conservatism to be associated with lower tolerance for ambiguity, openness to new experiences and cognitive complexity, but with higher need for structure – findings that were largely confirmed in a comprehensive review of the literature by Jost, Glaser, Kruglanski, and Sulloway (2003a).

Implicit in this research is the claim that, all else being equal, conservative beliefs tend to be cognitively less demanding than liberal beliefs. Conservatism is oriented toward tradition and the preservation of the status quo and, thus, entails resistance to change and uncertainty. Further, conservatism is more likely to invoke absolutes, such as the absolute distinction of right and wrong, the absolute sovereignty of the state or other authorities. According to various authors, conservatism is at least in part the result of the avoidance of uncertainty and complexity, which are experienced as inherently threatening by the individual (e.g., Wilson, 1973). Conversely, this line of argument links left-wing ideologies to embracing change and uncertainty as well as higher tolerance of ambiguity and complexity. Though theorists often view more basic personality characteristics as antecedents and (supposedly less ba-

sic) political ideologies as consequents, any causal claim concerning the relationship between personality and political ideology is inherently hazardous as it is based on correlational data.

Nevertheless, the hypothesis of a positive, linear association of conservatism and measures of cognitive functioning has received considerable empirical support (e.g., Jost et al., 2003a); yet, others argued that extremists at both ends of the ideological spectrum are highly similar. For instance, Greenberg and Jonas (2003) suggested that both right-wing and left-wing extremists are more dogmatic and less tolerant of ambiguity than the mainstream, though support for this hypothesis is scant (Jost, Glaser, Kruglanski, & Sulloway, 2003b).

Sidanius (1985) hypothesized that individuals at both ends of the political spectrum show *greater* cognitive sophistication than the mainstream. He argued that any deviation from mainstream beliefs requires higher levels of cognitive functioning as extremists need to be able to explain why they hold views different from the majority. By comparison, centrists, who typically outnumber extremists, face no similar intellectual challenges. As a result, highly functioning individuals should be overrepresented at the margins of the political spectrum.

1.1. Conservatism and general cognitive ability

This paper revisits the three hypotheses described above by examining the relationship between conservatism-liberalism and general cognitive ability (g), a potent predictor of people's success in life (e.g., Gottfredson, 1997). Much research on the conservatism-liberalism dimension has explored its cognitive correlates,

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but almost all of these studies have relied on self-report measures of cognitive functioning, including cognitive styles or preferences, which may or may not be correlated with standardized measures of cognitive ability (e.g., [Cacioppo & Petty, 1982](#); [Peterson, Deary, & Austin, 2005](#)). Thus, it is unclear if there is a link between conservatism-liberalism and cognitive ability. Further, [Lapsley and Enright \(1979\)](#) and [Bouchard et al. \(2003\)](#) reported a negative correlation between conservatism and general intelligence. However, [Wright and Phillips \(1979\)](#) did not find conservatism to be related to intelligence, and [Katz \(2001\)](#) even reported a positive relationship between conservatism and IQ. Thus, the evidence linking conservatism-liberalism and cognitive ability is mixed at best, and none of these studies addresses the possibility of a curvilinear relationship.

1.2. The present series of studies

This research tests the three hypotheses outlined above for the relationship between conservatism-liberalism and cognitive ability. Hypothesis 1 predicts there to be a linear and positive relationship between these constructs. Assuming that extremists of all stripes are similar in their lack of cognitive resources, Hypothesis 2 predicts an inverted U-shaped curvilinear relationship with higher cognitive ability in the political mainstream, and lower ability toward the extremes. Lastly, assuming that deviating from the political mainstream requires cognitive resources, Hypothesis 3 predicts a U-shaped curvilinear relationship with higher levels of cognitive ability toward the political extremes, and lower levels toward the center. Note that, while Hypothesis 2 and 3 make opposite predictions, Hypothesis 1 is compatible with either of the two. Indeed, investigations examining cognitive styles have obtained support for both Hypothesis 1 and 3 (e.g., [Jost et al., 2003b](#)).

2. Study 1

The first study correlated college students' conservatism-liberalism with their scores on the Scholastic Assessment Test (SAT) and the American College Test (ACT). Although both tests are typically treated as achievement tests, [Frey and Detterman \(2004\)](#) demonstrated that the SAT can be used as a measure of general cognitive ability. ACT and SAT are highly correlated ([Stumpf & Stanley, 2002](#)) and because ACT is also strongly correlated with verbal intelligence ([Sypher & Applegate, 1982](#)), it can serve as a measure of cognitive ability also (cf. [Neisser, Boodoo, Bouchard, et al., 1996](#)).

2.1. Method

2.1.1. Participants

As part of the Cooperative Institutional Research Program (CIRP), two entering cohorts at a large selective US university ($n = 11,088$) completed a comprehensive survey (response rate 87%). Approximately 85% of respondents granted researchers permission to access their official test scores. The present analysis focuses on individuals for whom self-described conservatism-liberalism, a measure of cognitive ability (SAT or ACT) and all control variables were available. Thus, the sample included 7279 students (49.3% women). Most described themselves as White (76.3%), 12.4% as Asian American, 6.4% Black, 3.4% as Hispanic and 1.4% as Native American.

2.1.2. Variables

2.1.2.1. Political self-description. Students were asked to describe their political orientation as "far left" (2.3%), "liberal" (34.8%), "middle of the road" (42.5%), "conservative" (19.4%), or "far right" (1.0%). Such a simple rating on a bipolar conservative-liberal

continuum is the most common method used to assess political orientation and is highly predictive of voting behavior in the US ([Jost, 2006](#)).

2.1.2.2. Conservative attitudes. Overall, 6805 students indicated their agreement or disagreement with 6 CIRP items concerning distinct social issues using a 4-point scale. A principal component analysis with varimax rotation revealed two factors that accounted for 55.6% of the overall variance. As summarized in [Table 1](#), the first factor, termed "gender role attitudes," was characterized by high factor loadings of supporting the legality of abortions, supporting a legal marital status to same-sex couples and rejecting the prohibition of homosexual relations. The second factor, termed "anti-regulation attitudes," was characterized by support for federal gun control, colleges prohibiting racist and sexist speech on campus, and higher taxes for the wealthy. Because split-half analyses revealed factor loadings to be highly reliable, weighted factor scores were computed. Thus, the two factor scores are uncorrelated, and have a mean of 0 and a standard deviation of 1. To facilitate interpretation, factors were rescored such that higher values indicated greater conservatism. Note that the factors reflect two very distinct aspects of conservatism: social conservatism and "small government" conservatism (libertarianism).

2.1.2.3. Cognitive ability. From the registrar's office ACT scores and SAT scores, separately for the mathematics (SAT-M) and verbal (SAT-V) subsections, were obtained. SAT scores vary between 200 and 800, and ACT scores between 1 and 36. Valid ACT data were available for 5893, and SAT data for 4082 students; 2696 students took both tests. The mean for SAT-M was 661.63 (SD = 73.94), for SAT-V 634.07 (SD = 74.23). The sample mean for the ACT was 27.82 (SD = 3.14).

2.1.2.4. Control variables. In all analyses students' sex, ethnicity/race, parental income and mother's education were controlled.

2.2. Results

2.2.1. Correlation between SAT and ACT

Replicating earlier research, SAT and ACT were highly correlated, $r(2696) = .801, p < .001$. Whereas SAT-M and SAT-V were moderately correlated, $r(4082) = .370, p < .001$, ACT was somewhat more closely related to SAT-V, $r(2696) = .690, p < .001$, than to SAT-M, $r(2696) = .644, p < .001$.

Table 1

Exploratory factor analysis with VARIMAX rotation performed on six social issues items

Items	Factor I "Conservative gender roles"	Factor II "Anti-regulation"
Abortion should be legal	.87	.09
Same sex couples should have the right to legal marital status	-.84	.19
It is important to have laws prohibiting homosexual relations	0.69	-.15
The federal government should do more to control the sale of handguns	.18	.72
Colleges should prohibit racist/sexist speech on campus	-.27	.63
Wealthy people should pay a larger share of taxes than they do now	.11	-.60
Variance explained	34.19%	21.39%

Note: Table entries reflect factor loadings, based on which weighted factor scores were computed. In subsequent analyses, factors scores were reversed such that higher values indicated higher levels of conservatism.

2.2.2. Relationship between political self-description and conservative attitudes

Pearson correlations between self-described conservatism-liberalism and attitudes were .47 for conservative gender roles and .22 for anti-regulation attitudes. These analyses confirm a consistent relationship between conservative-liberal self-description and attitudes, although they are hardly redundant.

2.2.3. SAT and ACT as a function of conservatism

To investigate whether conservative attitudes and self-description predict test scores, a hierarchical linear regression model was used. In the first step, I entered all control variables. In the second step, the conservative attitudes scores as well as political self-descriptions were added. In the final step, I entered quadratic terms for the two attitude scores and political self-descriptions to test for a non-linear association between conservatism-liberalism and cognitive ability.

Table 2 summarizes the results of this regression model using SAT-V, SAT-M and ACT as dependent variables. At step 1, the models replicate frequently documented effects of student background on performance, e.g., lower scores for certain minority groups compared to European Americans.

Second, including the two attitudes scores and political self-descriptions led to an increase in the model fit for SAT-V and

ACT, as evidenced in a significant rise of the variance explained (ΔR^2). Across models, self-described conservatism-liberalism as well as conservative gender role attitudes were related to lower SAT-V and ACT. These patterns support Hypothesis 1, i.e. a negative linear association between conservatism-liberalism and cognitive ability. Surprisingly, anti-regulation attitudes were positively related to both SAT-V and ACT; that is, the rejection of government control and restrictions on free speech was linked to greater cognitive ability. Note, however, that SAT-M was not predicted by any of the three conservatism variables.

Third, the inclusion of quadratic terms into the regression model improved the prediction of SAT-V and ACT, but again not that of SAT-M. Inspection of the three conservatism variables shows that, with the exception of anti-regulation attitudes and SAT-V, each quadratic effect is statistically significant. The positive sign of these significant coefficients clearly refutes Hypothesis 2, but supports Hypothesis 3's notion that extremists are higher in cognitive ability than centrists.

2.3. Discussion

Study 1 showed that conservatism is related to cognitive ability as measured by widely used standardized tests shown to measure general cognitive ability (e.g., Frey & Detterman, 2004). However, the relationship between political self-descriptions, conservative attitudes and cognitive ability is somewhat complex, providing support for two of the three hypotheses tested. First, there was substantial support for Hypothesis 1 concerning a negative, linear relationship between conservatism and cognitive ability: conservative gender role attitudes and self-descriptions predicted SAT-V and ACT. This pattern of findings replicates much of the results reported in the literature for other variables tapping cognitive functioning (e.g., Jost et al., 2003a). However, anti-regulation attitudes were related to higher, not lower, SAT-V and ACT scores. This result was not anticipated by any of the three hypotheses and diametrically contradicts Hypothesis 1, though it does replicate Katz (2001).

Second, there was also much evidence to support Hypothesis 3, the notion of a curvilinear relationship with political extremists commanding greater cognitive resources than those in the political center (Sidanius, 1985). This pattern was obtained for two conservatism-liberalism variables predicting SAT-V and three predicting ACT. Yet, it has to be acknowledged that whenever there was a significant quadratic term I simultaneously found a linear effect. That is, all else being equal, self-described conservative and more liberals, as well as social conservatives and liberals differed from middling respondents, but, compared to conservatives, liberals were still higher in SAT-V and ACT. However, the reverse pattern was found for anti-regulation attitudes, such that, all else being equal, more conservative respondents scored higher than more liberal respondents.

While Study 1 revealed similar links between conservatism-liberalism, and SAT-V and ACT, SAT-M was unrelated to conservatism-liberalism variables. Thus, based on the present data individuals high or low in conservatism (or liberalism) vary with regard to verbal ability, but not necessarily quantitative ability. This pattern is plausible because political discourse and argument primarily draw upon language-based resources.

3. Study 2

A limitation of Study 1 was that it focused on students who attended one of the top-25 US universities. Incoming students were disproportionately from relatively wealthy, educated families, holding test scores that were on average 1.5 standard deviations above the national mean. Though college-aged US citizens

Table 2
Hierarchical regression models predicting SAT and ACT from social attitudes

	Dependent variable					
	SAT-V		SAT-M		ACT	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
<i>Step 1: Control variables</i>		.060***		.183***		.134***
Sex of respondent	-.012		-.220***		-.114***	
Income	.013		.042**		.046***	
Maternal education	.136***		.085***		.110***	
Black	-.169***		-.241***		-.286***	
Latino	-.080***		-.105***		-.087***	
Asian	.011		.178***		.036**	
Native American	-.022		-.005		-.033*	
<i>Step 2:</i>		.032***		.002		.015***
<i>Conservative attitudes – linear trends</i>						
Self-described conservatism	-.088**		.000		-.037*	
Conservative gender roles	-.097***		-.035		-.085***	
Anti-regulation	.117***		0.03		.072***	
<i>Step 3:</i>		.012*		.001		.009***
<i>Conservative attitudes – quadratic trends</i>						
Self-described conservatism	.066***		.027		.069***	
Conservative gender roles	.094***		.004		.053***	
Anti-regulation	.028		-.028		.029*	
Final R^2	.106		.186		.158	
n	3842		3842		5552	

Note: Entries reflect standardized regression coefficients. European Americans served as the reference variable for the dummy-coded racial-ethnic group predictors. Parental income and maternal education were centered. Sex of respondent was coded male 0, female 1.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

are generally less likely to vote than the general population, college students are roughly twice as likely to vote compared to non-college attending citizens of the same age (Phillips, Urbany, & Reynolds, 2008). Further, at elite colleges student involvement in politics tends to be quite high, with voter turnout rates often exceeding the national average (e.g., Phillips et al., 2008). Further, other national CIRP data indicated that the student sample of Study 1 was almost twice as likely to become involved in student protests, such as a grass-roots political action, than the average US college freshman. Because personal involvement in the political domain moderates the link between personality and ideology (e.g., Kimmelmeier, 2007), one may suspect that Study 1 findings were contingent on high political involvement and might not generalize to the population as a whole. Study 2 sought to test Hypotheses 1–3 drawing on data from the entire US. However, in contrast to Study 1, the present research was conducted at the aggregate levels, examining patterns of political leanings, political involvement and cognitive ability at the level of US states.

3.1. Method

The data were composed of variables obtained from various secondary-data sources for all 50 US states. All data pertained to 2004, the year of a US general election (which included a Presidential election).

3.1.1. Cognitive ability

McDaniel's (2006a) estimates of cognitive ability for each US state served as main dependent variable. McDaniel generated his estimates based on the National Assessment of Educational Progress (NEAP), a large-scale program that administers standardized tests in reading and mathematics to representative samples of public school students in all 50 US states. State estimates were validated against a series of established correlates of intelligence and they were shown to be superior to other efforts to assess indicators of state-level differences in cognitive ability (McDaniel, 2006a, 2006b). McDaniel's estimates use the metric of IQ scores, with a mean of 100 and a standard deviation of 15.

3.1.2. Political orientation

To gauge the general political leanings of each state I selected the 2004 proportion of Democratic lawmakers among all lawmakers across both houses of a state's legislature (Morgan Quitno, 2006). In the US two-party system it is well-known that Democrats are on average more liberal than conservatives; hence, an electorate that is more likely to vote for Democrats to rule their state can be assumed to be more liberal. Because the number of independents and members of other parties is generally negligible, the proportion of Republican lawmakers is roughly the complement to the proportion of Democrats (average 48.70%, SD = 15.64).

3.1.3. Political involvement

To measure how politically engaged the population of a state was, I chose the official voter turnout rate in the 2004 general election (Morgan Quitno, 2006). Across the 50 states the mean was 61.37% (SD = 6.60).

3.1.4. Control variables

Because members of US minority groups typically score lower on standardized tests, via the US Census Bureau I obtained the proportion of African American and Latino residents in each US state in 2004. Similarly, gross state product per capita for 2004 was con-

trolled because of the established link between state wealth and state-IQ (McDaniel, 2006a).

3.2. Results

Using again a hierarchical regression model, state-IQ was predicted based on voting participation rates and the proportion of Democratic lawmakers. Following Friedrich (1982), all predictors and the dependent variable were standardized. In the first step I added the control variables ($\Delta R^2 = .546, p < .001$), in step 2 the linear terms for the two main predictors ($\Delta R^2 = .126, p < .002$), in step 3 the quadratic term for Democratic lawmakers ($\Delta R^2 = .016, p > .15$), and in Step 4 in interaction between linear terms for voting participant and Democratic lawmakers ($\Delta R^2 = .107, p < .001$). The final model, summarized in Table 3, explains 80% of the overall variance. There was no support for Hypotheses 2 and 3, as the quadratic term was not significant. However, the significant interaction term indicated that, at high levels of political involvement (1 SD above the mean) there was a positive relationship between the proportion of Democratic lawmakers and state-IQ, simple slope $\beta = .380, p < .02$. This finding is consistent with Hypothesis 1; however, at low levels of political involvement (1 SD below the mean) greater proportions of Democratic lawmakers were linked to lower state-IQs, $\beta = -.475, p < .001$. In other words, in states with low voter turnout, in-state support for the more liberal Democrats was related to lower state-IQ.

3.3. Discussion

Although conducted at a different level of analysis than Study 1, Study 2 yielded some support for Hypothesis 1: In states with high political involvement, there was a linear and positive relationship between state-IQ and the proportion of Democrats in the state legislature. This finding represents a conceptual replication of important aspects of Study 1. At the same time, Study 2 also replicated an unanticipated finding in Study 1, namely, that some conservative leanings were related to higher cognitive ability. In Study 2, this finding was quite robust, but was confined to states with comparatively low political involvement. Unfortunately, Study 2 did not allow the examination of different kinds of conservative leanings, but relied on the proportion of Democratic lawmakers in a state's legislatures. Similarly, Study 2 did not permit the examination of different aspects of cognitive ability; thus, it remains open whether

Table 3
Hierarchical regression model predicting US state-level intelligence

	State-IQ β
<i>Control variables</i>	
GSP/capita (\$100 millions)	.179*
% of African Americans	-.433***
% of Hispanics income	-.505***
<i>Linear terms</i>	
Voting participation	.344**
% of Democratic lawmakers	-.047
<i>Quadratic term</i>	
% of Democrats (squared)	.059
<i>Linear interaction</i>	
Voting participation \times % of Democratic lawmakers	.398***
R^2	.795

Note: Entries reflect standardized regression coefficients. GSP/capita (\$100 millions) refers to general state product per capita in \$100 millions. All variables were standardized prior to analysis.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

observed effects were largely driven by verbal ability, as suggested by Study 1.

4. General discussion

The present studies paint a somewhat complex picture of the relationship between cognitive ability and political orientation. There was general support for [Adorno et al.'s \(1950\)](#) notion that higher conservatism (lower liberalism) was linked to lower cognitive functioning (Hypothesis 1). Yet, the present research also documents that more conservative attitudes may be associated with *greater* ability, especially when, as in Study 1, conservative attitudes concerned government control (a chief concern in libertarian thought), and in Study 2, when levels of political involvement were low. As such, these studies simultaneously replicate the inconsistencies of prior research (e.g., [Bouchard et al., 2003](#); [Katz, 2001](#)). While a clear theoretical rationale for a positive relationship between conservatism and cognitive ability may be lacking, it appears, however, that the implicit assumption of earlier research, that conservative beliefs are inherently less cognitively demanding than liberal beliefs, is not tenable in light of the present data.

Hypothesis 3, [Sidanius's \(1985\)](#) notion that extremists, whether conservative or liberal, command greater cognitive resources also garnered a good deal of support. Arguably, in Study 1 this hypothesis received the most support of all three hypotheses because it held regardless of whether the specific conservatism-liberalism variable had a positive or negative relationship with cognitive ability. Conversely, Study 1 shows that an exclusive curvilinear effect of political ideology on cognitive functioning remains the exception rather than the rule, and that the combination of a linear and curvilinear effects are typical (cf. [Jost et al., 2003b](#)). The fact that Study 2 did not produce any support for Hypothesis 3 is likely the result of the different units of analysis in Study 1 and 2, and a topic to be investigated in future research.

In the present data there was no evidence whatsoever to support the notion that those on the political fringes have lower cognitive ability than those with middling views (Hypothesis 2). Even though this notion regularly emerges in the literature (e.g., [Greenberg & Jonas, 2003](#)) the continued absence of any confirmatory evidence suggests that it might be time to retire this idea.

Given that this research has established various linkages between political orientation and cognitive ability, one might wonder which way the causal arrow goes. Excluding the possibility that a third variable has created the correlation between political orientation and cognitive ability, does one's cognitive ability shape one's political ideology, or do one's political beliefs have an impact on one's level of cognitive ability? Both paths are possible, though it may be more plausible to view cognitive ability as more basic antecedent to one's political orientation than the other way around. For example, documented genetic influences are more pronounced for cognitive ability than political orientation (e.g., [Neisser et al., 1996](#)). However, as alluded to earlier, the present correlational data do not allow any firm conclusion with regard to causality.

A potential criticism of this research concerns the relatively small effect sizes that especially Study 1 uncovered where standardized regression coefficients rarely exceeded .10 (see [Table 2](#)). While small effect sizes are still theoretically meaningful ([Prentice & Miller, 1992](#)), Study 2 took advantage of using aggregated scores from literally hundreds of thousands of students whose test scores contributed to [McDaniel's \(2006a\)](#) state-IQ scores, as well as party membership in a state's lawmakers, which is also the product of an aggregation process across thousands, if not millions, of voters. The "miracle of aggregation" reduces error variance and increases coefficients. As a result, the relevant Study 2 coefficients (simple slopes) were considerably larger. Nevertheless, one may argue that,

at the individual level, the relationship between political orientation and cognitive ability is of small practical significance. This is accurate, but not surprising, given the multitude of factors shaping political beliefs.

Other criticism of the present work may come from authors who view work on the psychological correlates of political ideology as ideologically biased (e.g., [Durrheim, 1997](#); [Greenberg & Jonas, 2003](#)). It is sometimes alleged that the nature and choice of the cognitive variables, typically self-report measures of cognitive styles, reveal decidedly anti-conservative tendencies. However, by relying on standardized tests to measure cognitive ability at the individual (Study 1) and state (Study 2) level, the present research is impervious to this criticism.

In closing, it appears that the practical implications of the present research are not yet entirely clear. For instance, in the highly functioning student sample of Study 1 conservatism was often linked to slightly lower verbal ability. Therefore, one might wonder whether in language-intensive academic disciplines conservative students are at a disadvantage compared to liberal students. [Kimmelman, Danielson, and Basten \(2005\)](#) concluded that in many such academic disciplines conservative and liberal students do equally well. However, to the extent that the type and level of their cognitive abilities steers individuals toward or away from certain careers, some of the present findings might lead one to predict a greater number of liberals in humanistic and other heavily language-based disciplines. Indeed, [Klein and Western \(2005\)](#) demonstrated that, in American academia, humanistic disciplines are more heavily dominated by faculty who support the Democratic Party than is the case for disciplines less heavily based on language (e.g., natural sciences). Any assumption, however, concerning the implications of conservatism for career choice or success is complicated by the fact that Study 1 provided substantive evidence for a curvilinear relationship between conservatism and cognitive ability, and Study 2 highlighted the importance of political involvement. Thus, future research needs to explore how conservatism and its cognitive correlates shape individual outcomes, within and outside of academia.

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