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ATTITUDINAL RESPONSES TO MIXED EVIDENCE: THE ROLE OF ATTITUDE  
EXTREMITY AND POLITICAL IDEOLOGY IN EFFECTING CHANGE VERSUS  
RESISTANCE

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of  
Philosophy at Virginia Commonwealth University

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## **Abstract**

### **ATTITUDINAL RESPONSES TO MIXED EVIDENCE: THE ROLE OF ATTITUDE EXTREMITY AND POLITICAL IDEOLOGY IN EFFECTING CHANGE VERSUS RESISTANCE**

By Jessica M. Barber, Ph.D.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2012

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Four studies investigated the effects of attitude extremity and political ideology on the degree and direction of changes in issue attitudes following the presentation of mixed evidence. Based upon previous work, it was predicted that those holding relatively more extreme attitudes would resist changing those views when presented with a mixture of supporting and opposing statements and would potentially adopt more extreme evaluative positions – a phenomenon known as attitude polarization (Lord, Ross, & Lepper, 1979). Evaluative entrenchment or intensification was also expected among more politically conservative participants, based upon prior work describing cognitive rigidity and resistance to change as more characteristic of the political right than left (e.g., Jost, Glaser, Kruglanski, & Sulloway, 2003). An interaction of attitude extremity and political ideology was also hypothesized, such that liberal individuals with moderate attitudes were expected to demonstrate the least propensity to polarize.

Participants' attitudes regarding abortion rights (Study 1), gun control (Study 2), tax increases (Study 3), and environmental preservation (Study 4) were assessed before and after

reading statements that both opposed and supported the issue. Political ideology was also assessed, along with several individual difference factors. Across all four studies, attitude extremity significantly predicted evaluative change, although the pattern of that effect varied. Political ideology did not emerge consistently as a predictor of attitude change; however, significant interactive effects of extremity and ideology were found. In addition, several individual difference factors (i.e., gender, need for cognition, issue importance) were found to moderate the effects of the primary predictors on attitude change, and some divergent result patterns were found when comparing data from a college and non-college sample in Study 4. Taken together, these studies provide evidence that attitude extremity and political ideology influence the degree and direction of evaluative change following the presentation of mixed evidence. In addition, they identify other factors at work in effecting change versus resistance, thereby highlighting the multi-faceted and complex nature of persuasion in a political context.

## Attitudinal Responses to Mixed Evidence: The Role of Attitude Extremity and Political Ideology in Effecting Change versus Resistance

In contemporary US politics, political discourse often seems more like partisan grandstanding and drum-beating than effective deliberation in the interest of arriving at consensus. The summer 2011 dead-locked talks over if and how to raise the national debt ceiling in order to avoid a government default provide a poignant but by no means atypical example of inflexibility in Washington. Even with so much at stake, and despite bipartisan “negotiations” extending into weekends and holidays, the deadline loomed ever larger with no viable resolution in sight. Many of these inter-party talks were convened in an effort to present balanced and fair arguments about the merits and limitations of both sides’ opinions in the interest of arriving at a reasonable, unbiased solution. Democratic and Republican leaders alike asserted the importance of arriving at such a solution, and yet for weeks, bipartisan discussions resulted in little more than each side espousing the superiority of its preferred budget plan and accusing the other of irrational and irresponsible bull-headedness. Why is compromise so difficult to achieve?

The “debt debacle” was infused with a variety of staunchly endorsed attitudes surrounding the debt ceiling, balancing the budget, spending cuts, and tax increases. Congressional players, party leaders, and even the president voiced strong evaluative positions on these issues beginning early in the negotiation process; the bipartisan budget talks did little to ease the in-fighting and certainly did not convince those involved to loosen their hold on their initial attitudinal positions willingly. In fact, discussion of these varied views prompted many individuals to cling to their original attitudes with even greater intensity and in some cases may have led some to shift their evaluative stance to an even more extreme version of the view they previously held. The propensity for individuals advocating an extreme attitude about a particular

target or issue (politicians and laymen alike) to adopt an even more extreme attitude following exposure to a mix of supportive and oppositional evidence is a phenomenon known as attitude polarization (Lord, Ross, & Lepper, 1979). Applied to the recent debt crisis, attitude polarization may help to explain how an issue of national importance (averting a default), negotiations aimed at achieving compromise (bipartisan budget talks), and extreme attitudes (e.g., “we cannot increase taxes,” “we must increase taxes”) came together to form a “perfect storm” that brought the nation perilously close to economic disaster.

In order to make sense of the deliberation gridlock – and the rarity of truly bipartisan consensus in general – it may be helpful to consider factors underlying the chaotic and frustrating climate prevailing in Washington. How does political ideology affect bipartisan negotiations? Do allegiances to one’s party or to one’s pre-conceived notions make compromise and consensus impossible? Very generally, do liberals and conservatives differ in their propensities to compromise versus polarize? Or do close-mindedness, intolerance of alternative views, and resistance to attitude change describe the political left and right equally well?

### **Political Ideology**

For more than six decades, researchers have investigated the underlying differences between political liberals and their conservative counterparts. Over that time, a plethora of theories have been advanced regarding such individual differences as personality characteristics, epistemic and existential motivations, and sociopolitical orientations that are purported to capture the essence of the distinction between those on the ideological right versus left. Researchers uncovering these distinctions view them as meaningful diagnostic differences that, taken together, paint a picture of individuals on the political right as less open, less tolerant, and less

flexible than those on the left, who are pictured as valuing fairness and equality over authority and convention and emphasize the progressive potential of change.

**Personality differences.** Theories surrounding the personality differences between individuals on the political left and right began to emerge in the midst of the Second World War. One of the earliest systematic treatments of these differences was described by Nazi psychologist Erich Jaensch (1938), who proposed two personality types that differed in their propensity to become “good” or “bad” Nazis. The J-Type was characterized by decisiveness, persistence, aggression, and allegiance to tradition and established leaders; Jaensch (1938) looked favorably on J-Types, as he considered them to be predisposed to make good Nazis. In contrast, the S-Type personality profile consisted of ambiguous and indefinite decision making, lack of perseverance, eccentricity, and “perceptual slovenliness” (Carney, Jost, Gosling, & Potter, 2008); S-Types were considered weak and inferior fodder for Nazism.

Jaensch’s (1938) personality distinctions were later echoed by a group of American researchers known as the “Berkeley team,” although the connotation surrounding the inherent “goodness” or “badness” of the two types was, in essence, reversed. In an attempt to explain and understand the rise of Fascism during the 1930s and 1940s that culminated in regimes such as Nazism in Germany and Italian Fascism under Mussolini during World War II, Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) published *The Authoritarian Personality*, a seminal work that focused on the development and defining features of authoritarianism, as well as the link between authoritarianism and vulnerability to the influence of Fascism. Adorno et al. (1950) contended that harsh parenting styles resulting from economic hardships contributed to the development of a stable personality profile characterized by obedience to authority figures and a tendency to punish social outcasts and scapegoats. According to Adorno and colleagues (1950),

this combination of anxious devotion to authority and to conventionalism coupled with vindictiveness toward out-groups was particular to political conservatives; liberal individuals, by and large, did not possess or exhibit authoritarian personalities and tendencies, due at least in part to differences in their early childhood experiences and upbringing.

Because of this underlying difference, Adorno et al. (1950) concluded that a personality assessment aimed at identifying the presence of antidemocratic tendencies could reliably differentiate high and low authoritarians and that this differentiation, in turn, would allow for the prediction of which individuals were most susceptible to Fascist propaganda in the general U.S. population. The researchers developed and validated a measure of “implicit antidemocratic tendencies,” the F-scale, which was purported to identify individuals whose personality make-up (as determined via their responses to the measure) predisposed them to the influence of Fascist propaganda and put them at risk of becoming Fascists themselves.

Since then, several lines of research have examined differences between conservatives and liberals in terms of personality traits. In an effort to improve upon the methodological weaknesses of the Berkeley team’s (1950) F-scale, Wilson (1973) and colleagues (e.g., Wilson & Patterson, 1968) developed a measure of general conservatism called the C-scale. Dissatisfied with the use of all positive, statement-form attitude scales in the F-scale, Wilson (1973) devised a scale that required individuals to report their immediate, affective reactions to a series of pertinent buzz words and phrases (e.g., “death penalty,” “evolution”), which he contended were truer predictors of actual behavior. High scores on the C-scale revealed a syndrome of conservative characteristics, including right-wing political orientation, religious fundamentalism, preference for convention, and intolerance of minorities. Those who scored lower on the C-

scale, in contrast, generally aligned themselves with the political left, preferred change over the status quo, and were more tolerant of minorities and out-groups.

Others have focused on differences in openness to experience as an underlying distinction between the ideological right and left (Altemeyer, 1996; McCrae, 1996; Riemann, Grubich, Hempel, Mergli, & Richter, 1993; Ray, 1983; Stone, 1981; van Hiel & Mervielde, 1996). Eysenck (1954) first proposed that political liberals were generally higher in sensation-seeking and extraversion than were conservatives and that these discrepancies in need for (i.e., tolerance of) stimulation were, in part, biologically based. Results from these and other studies have consistently demonstrated significant negative correlations between conservatism and openness. That is, political conservatives consistently score lower on the personality domain of openness to experience (characterized by open-mindedness, empathy, novelty-seeking, and intellectual curiosity) than do liberal individuals. In an effort to further generalize this pattern of results, van Hiel, Kossowska, and Mervielde (2000) assessed the ideological positions and personality profiles of a cross-national sample of European students, non-students, and political party members. Even in this diverse sample, van Hiel and colleagues (2000) found conservatism to be related to lower scores on the openness subscale of the NEO personality inventory (NEO-PI-R; Costa & McCrae, 1992). Liberals, in contrast, scored significantly higher on the openness subscale. Van Hiel et al.'s (2000) findings strongly suggest that the relationship between trait levels of openness to experience and conservatism are not particular to US college samples. That the openness-ideology link has been found and replicated across cultures, age groups, and levels of political participation bolsters the claim that differences in a key facet of personality – openness to experience – may underlie individual differences in political ideology.



During the 1980s and 1990s, Altemeyer worked to improve upon previous attempts to define conservatism by developing a theory of right-wing authoritarianism (RWA). Building upon what he saw as the admirable but incomplete foundations laid by the Berkeley research team (1950) and others (e.g., Wilson, 1973), Altemeyer sought to develop a more methodologically sound formulation of the concept of authoritarianism. At the core of Altemeyer's RWA lay three covarying attitudinal clusters: authoritarian submission (i.e., obedience to established authority figures and institutions), authoritarian aggression (i.e., aggressive tendencies directed at out-groups and other targets as sanctioned by established authorities), and conventionalism (i.e., strict adherence to societal norms and traditions endorsed by authorities). Importantly, Altemeyer (1981) argued that the RWA profile required the convergence of all three elements: An individual had to report or exhibit evidence of submission to authorities, aggression toward out-groups, *and* adherence to tradition in order to be labeled high in RWA. Through several iterations, Altemeyer created a measure of RWA that combined what he saw as the most interconnected and pertinent items from pre-existing measures (e.g., F-scale, C-scale, dogmatism scale). Altemeyer's scale has been shown to correlate with right-wing political party allegiance, desire for conventionalism, religious fundamentalism, and prejudice (e.g., Altemeyer, 1981).

Another personality factor of empirical study has been intolerance of ambiguity. In 1949, Frenkel-Brunswick first investigated intolerance of ambiguity, which she conceptualized as a proneness for dichotomous (i.e., "black and white") thinking, rigid categorization of the social world and its norms, and a preference for clear distinctions as opposed to qualified statements and comparisons. Frenkel-Brunswick (1949) explained the source of this intolerance in Freudian terms: the antecedents of intolerance of ambiguity were emotional conflict with one's parents

coupled with a simultaneous tendency to idealize them. Later researchers developed a new theoretical perspective of intolerance of ambiguity, focusing instead on perceptions of the ambiguous as threatening and the familiar as safe (e.g., Budner, 1962). Intolerance of ambiguity, it was theorized, led conservative individuals to cling to convention, seek certainty, and resist consideration of new and relevant information once a decision has been reached (Furnham & Ribchester, 1995).

Finally, Tomkins (1963) advanced the theory of ideo-affective polarity, which focused on the role of affect in the development and maintenance of ideological orientations, as well as the pervasiveness of such orientations into nearly all aspects of life. According to Tomkins (1963), there are two broad orientations toward the world: one associated with liberty and humanism (LEFT) and one concerned with rule following and normative focus (RIGHT). Through emotional experiences in early childhood, individuals come to prefer and adopt one of these orientations. Tomkins (1963) argued that one's general orientation, either to the left or to the right, pervaded not only one's political life but also such domains as mathematics, literature, and science. For example, according to Tomkins' theory, a left-oriented individual would approach the disciplines of politics, art, music, mathematics, science, education, etc. from the same general perspective: that each is an opportunity to tap into and express human creativity and improve upon the human condition. For a right-oriented person, in contrast, the appeal and aim of art, science, and politics lies in adhering to rules, developing discipline, and establishing and preserving certainty. Because of this interconnectedness, Tomkins (1963) believed that knowing an individual's beliefs and focus in one domain afforded you knowledge of his or her views in other domains.

**Epistemic and existential motives.** Early work into the defining characteristics of conservatism focused on not only personality traits but also individual motivation. In contrast to more static personality theories of conservatism, Huntington (1957) maintained that the conservative ideology was necessarily wedded to particular historical and political situations. That is, certain environmental elements, most notably threats to the established social order, set the stage for the adoption and embracing of conservative views. Huntington (1957) described political conservatism as a cluster of general tendencies geared toward the preservation of existing institutions and established inequalities and characterized conservatives as fearful of challenges to the established order. Huntington (1957) posited that this opposition to change was rooted in a concern that abandoning the status quo could leave a society vulnerable to chaos, lawlessness, and general upheaval. Huntington's investigations constitute some of the earliest work identifying motivational factors as elements important to the description of conservatism specifically.

More recently, several researchers have theorized that ideological differences are based upon underlying differences in personal motivation. Lay epistemic theory (LET; Kruglanski, 1989) holds that an individual's belief system is the consequence of motivated information searches that have both cognitive and motivational components. Of central importance to LET is the motivational construct of need for cognitive closure (Webster & Kruglanski, 1994), which refers to the desire to hold a firm belief – any firm belief – as opposed to experiencing uncertainty and confusion. Although such a preference for a solidified, coherent belief system could lead to the endorsement of any established ideology, research has shown a greater need for closure among political conservatives than among political liberals (Jost, Kruglanski, & Simon, 1999). In explaining this pattern, Jost et al. (1999) contended that the need for cognitive closure

is better served by a belief system that advocates conventionalism and maintenance of the status quo (i.e., conservatism) than by one built around the principles of change and continual progression (i.e., liberalism).

Conservatives and liberals also differ in terms of their focus and goals. Work in the regulatory focus tradition (e.g., Higgins, 1997, 1998) has shown that political conservatives are more apt to adopt a “prevention focus” toward achieving goals, which is categorized by avoiding unpleasantness (e.g., failure, danger) and adhering to duty and obligation in an effort to achieve goals of safety and responsibility fulfillment (i.e., “ought goals”). In contrast, political liberals tend to adopt a “promotion focus,” whereby they seek out and approach pleasantness (e.g., success, satisfaction) as a means of achieving goals related to personal growth and advancement (i.e., “ideal goals”). These two foci mesh with characterizations of conservatives as preferring the familiar to the novel and being uncomfortable with change and liberals as endorsing change and the pursuit and tolerance of the non-traditional.

**Sociopolitical orientations.** In contrast to the individual difference and motivational approaches outlined above, there also exist sociopolitical theories of the differences between liberals and conservatives. Specifically, these theories emphasize the role of existing social systems and the functional consequences of adopting a conservative versus liberal view. These theories also seek to explain the connection between many aspects of social conservatism and such problems as sexism, ethnocentrism, and intolerance.

Social dominance theory is one such sociopolitical approach to understanding differences between liberals and conservatives. According to social dominance theory, the drive to sustain human societies leads to the creation of belief systems aimed at justifying the relative standing of various groups within the social hierarchy (Sidanius & Pratto, 1999). Because these belief

systems seek to justify and uphold the status quo, they are inherently conservative ideologies. In addition to these societal belief systems, there are individual-level differences in the extent to which one endorses or denounces them. Those who are high in social dominance orientation (SDO) think about their social world in hierarchical terms and are motivated to preserve the dominance of high-status groups (e.g., Whites, men, upper-class), whereas low-SDO individuals view the world in more egalitarian terms and show a preference for attenuating or dismantling the established social hierarchy (Sidanius, 2010). Factor analysis of the SDO scale has revealed two underlying factors: a desire for dominance based on group membership and opposition to group equality (Jost & Thompson, 2000). These dimensions are clearly reminiscent of elements highlighted by earlier researchers, such as adherence to conventionalism and authoritarian aggression.

Social dominance theory endeavors to explain conservative, “hierarchy-enhancing” orientations among society’s higher-level groups. At first glance, it would seem that members of groups lower in the existing social hierarchy (e.g., women, racial and religious minorities) would tend to be oriented toward attenuating that hierarchy, motivated by a desire to end or overthrow the established order to improve their relative standing in society. Paradoxically, however, high SDO scores and propensities to preserve the status quo are found among historically and socially oppressed groups (Jost & Banaji, 1994). A complementary theory, system justification theory (SJT), offers an explanation for right-wing/conservative allegiance among lower status groups (Jost & Banaji, 1994; Jost & Thompson, 2000). According to SJT, individuals rationalize existing social systems in terms of fairness and legitimacy, thereby perpetuating hierarchical ideologies and social systems. Individuals from historically disadvantaged groups are presumed to feel a great deal of dissonance between the need to support the current system and the

suffering they endure because of their place in it. Paradoxically, this can lead some members of lower-status groups to even more strongly endorse and support the system as a means of reducing the dissonance (Jost, Glaser, Kruglanski, & Sulloway, 2003a). Motivations to view the world as a just and fair place (Lerner, 1980) may also help to explain hierarchy-endorsing orientations and conservative tendencies among low-status groups.

There is a strong and substantial body of empirical work documenting the personality, motivational, and sociopolitical differences between liberals and conservatives. Across a variety of research domains, empirical work has shown that features such as intolerance for ambiguity, heightened need for closure, and preference for the status quo and existing inequalities are characteristic of the political right. In turn, the profile of the political left consists of openness, tolerance, and preference for change and equality. The picture of political orientation that emerges is one of necessary juxtaposition between openness on the left and the rigidity on the right.

### **Rigidity of the Right**

Several studies provide direct evidence that mental rigidity and resistance to change are uniquely characteristic of the political right. Altemeyer's program of research surrounding right-wing authoritarianism has consistently demonstrated that high scores on the RWA scale are positively correlated with dogmatism, religious fundamentalism, prejudice toward out-group members, and political conservatism (e.g., Altemeyer, 1981; Altemeyer & Hunsberger, 1992). In a series of cross-national studies in the 1970s, Altemeyer collected data from US and Canadian college students from large, urban, geographically diverse universities. Participants completed a battery of measures, including Adorno et al.'s Fascism (F) scale, Rokeach's dogmatism (D) scale, Wilson's conservatism (C) scale, and Altemeyer's RWA scale. Across

samples, high RWA scores covaried with a) preference for conservative political parties, b) religious fundamentalism and acceptance of parents' (i.e., established) religion, and c) dogmatic adherence to ideological beliefs. In contrast, individuals scoring low on the RWA scale reported less support for fundamentalist forms of religion and greater open-mindedness in regards to alternative views; low RWA scores were also positively correlated with preference for left-leaning political parties. These findings provide evidence that RWA is associated with a host of factors related to mental rigidity, including dogmatism, religious fundamentalism, and prejudice. In addition, Altemeyer's work indicates that higher RWA scores are more characteristic of the political right than the political left.

An interesting study conducted by Conover and Feldman (1981) explored the ways in which average citizens come to categorize themselves and others as "liberal" versus "conservative." Using data collected during the 1976 National Election Study, Conover and Feldman (1981) examined the relationship between individuals' self-reported political identification on a scale from 1 (extremely liberal) to 7 (extremely conservative) and their ratings of several factors potentially underlying their definitions of what it means to be liberal versus conservative. Results indicated that one of the most important and frequently reported explanations for what differentiates conservatives and liberals was "change": those surveyed tended to view openness to change and progress as a defining feature of liberalism, whereas resistance to change was seen as a calling card of conservatism. Conover and Feldman's (1981) work shows that characterizations of the political right as more resistant to change than the left are not limited to experts, political elites, or others well-versed in the psychological distinctions between liberals and conservatives: The difference in reactions to change are so fundamental as to be apparent to the average citizen.

In an effort to integrate theories of the epistemic, existential, personality, and ideological motivations underlying conservatism, Jost and colleagues (2003a) conducted a large-scale meta-analysis, incorporating 88 samples from 12 different countries. The researchers found conservatism to be significantly negatively correlated with integrative complexity ( $r = -.20$ ;  $d = -.41$ ), openness to experience ( $r = -.32$ ;  $d = -.68$ ), and uncertainty tolerance ( $r = -.27$ ;  $d = -.57$ ). Conservatism was found to be significantly positively correlated with dogmatism/intolerance of ambiguity ( $r = .34$ ;  $d = .73$ ); needs for order, structure, and closure ( $r = .26$ ;  $d = .54$ ); fear of threat or loss ( $r = .18$ ;  $d = .38$ ); mortality salience ( $r = .50$ ;  $d = 1.20$ ); and system instability ( $r = .47$ ;  $d = 1.08$ ). Based on this pattern of significant correlations, Jost et al. (2003a) concluded that the various correlates and manifestations of conservatism (e.g., epistemic needs, social system concerns, openness, and ideological dogmatism) are diverse but connected.

Specifically, Jost and colleagues (2003a, 2003b) proposed that conservatism can best be conceptualized as a form of motivated social cognition, thereby integrating factors related to epistemic and existential motivations, personality propensities, and sociopolitical orientations. Jost et al. (2003a, 2003b) argued that the two defining aspects of political conservatism are opposition/resistance to change and acceptance of/preference for inequality. Further, the researchers held that psychological motives to manage uncertainty and fear explained these dimensions: A desire to manage uncertainty is at the root of change resistance, and the need to manage fear manifests as a preference for inequality (whereby out-group members are kept at a safe distance). The researchers contended that these underlying psychological foci explain the otherwise widely varied constellation of motivations, personality differences, and belief systems that characterize conservatism and serve to integrate various theoretical perspectives on conservatism that have appeared over more than half a century's worth of research. Specifically,



Jost et al. (2003a, 2003b) identified uncertainty and fear management as key motivational factors underlying right-wing rigidity.

Over the past several decades, a number of empirical investigations have provided evidence that conservatives are more cognitively rigid, more dogmatic, and more resistant to change than are political liberals. Altemeyer's research program has reliably demonstrated, across samples and over time, that individuals differ in terms of their authoritarian aggression, authoritarian submission, and conventionalism – and that higher levels of authoritarianism are more characteristic of the political right than the political left. Conover and Feldman's (1981) large-scale study spoke to the primacy of differential responses to change as a core distinction between liberals and conservatives – one so fundamental that average citizens based their categorizations of the political right versus left upon it. More recently, Jost and colleagues (e.g., Jost et al., 2003a, 2003b) have argued and provided evidence that two psychological motivations – managing uncertainty and staving off fear and threat – give rise to a pervasive pattern of resistance to change and acceptance of inequality that is unique to political conservatism. Taken together, these and other studies speak of an inherent distinction between liberals and conservatives in terms of mental rigidity and change resistance, in which those on the right are systematically more rigid and resistant than those on the left.

### **Ideological Extremism**

Research trumpeting the “rigidity of the right” is not without its critics, however. Contemporaries of Adorno and colleagues, including Shils (1954), Christie (1954), and Rokeach (1960), attacked *The Authoritarian Personality* for its “lopsided” focus on the political right. Barker (1963) and Smithers and Loblely (1978) sought to identify the presence of authoritarian tendencies in both right-leaning and left-leaning elements of the political sphere. More recently,

Greenberg and Jonas (2003) have challenged claims that motivations to reduce threat and uncertainty are unique to the ideological conservative, arguing instead that both the far left and the far right exhibit dogmatic adherence to convention and tolerance of inequality. These and other opponents of the “rigidity of the right” contend that mental rigidity, preference for order and control, and negative attitudes toward out-groups are not elements particular to political conservatives but rather can be found in abundance at both extremes of the ideological spectrum.

Shils (1954) rejected the traditional view of the bipolar ideological continuum, anchored at either end by the “extreme left” and “extreme right,” as too narrow. Pointing to tumultuous political developments during the first half of the twentieth century, particularly in Russia, Shils (1954) called into question the conventional wisdom that authoritarianism (as defined by Adorno et al., 1950) was a distinctly conservative phenomenon. Shils (1954) argued that the political right and left were not necessarily diametrically opposed and that, in fact, the extreme endpoints of the continuum (e.g., reactionaries/fascists on the far right; revolutionaries/communists on the far left) were quite similar in terms of hostility toward civil liberties, political democracies, parliamentary institutions, and individualism. Shils criticized the Berkeley team’s (1950) treatment of authoritarianism as narrow-minded, biased, and methodologically unsound, contending that the authors of *The Authoritarian Personality* had been blinded by their misconceptions about a right-left dichotomy and had, as a result, overlooked meaningful similarities at the ideological extremes.

Shils (1954) also took issue with Adorno et al.’s (1950) exclusive focus on personality characteristics as the sole predictors of vulnerability to Fascist influence. According to Shils (1954), the effects of one’s political context and broader social environment should not be underestimated as a contributor to, or defense against, the adoption of authoritarian ideals. A

climate of economic hardship, a charismatic leader, the ideological bent of the ruling regime, and societal norms and institutional constraints can all affect the likelihood that an individual will come to endorse and act upon underlying “antidemocratic tendencies.” Shils (1954) argued vehemently that, by overlooking situational factors that could act as catalysts or constraints, Adorno et al. (1950) came to view personality factors as overly diagnostic of vulnerability to Fascism.

Additional, related concerns about the Berkeley team’s (1950) methods and conclusions were raised by Christie (1954). In particular, Christie contended that much of the methodological criticisms being lobbed at *The Authoritarian Personality* – and at the F-scale in particular – stemmed from a lack of clarity as to the work’s theoretical underpinnings. Christie saw *The Authoritarian Personality* as seriously lacking in theoretical integration and argued that it was more accurately thought of as a descriptive summary of the development and validation of several measures of prejudice, ethnocentrism, and Fascist predilections. Specifically, Christie (1954) questioned the relationship between the F-scale and authoritarianism, noting that nowhere in Adorno et al.’s (1950) work is the F-scale referred to as an authoritarianism scale. Christie contended that, although the F-scale did appear to assess receptivity to Fascism (as demonstrated in terms of convergent validity with other personality, attitudinal, and behavioral measures of Fascism), the scale was insufficient to capture authoritarian tendencies on the political left, especially among those ascribing to Communism. Focusing his attention on the smattering of self-identified communists in Adorno et al.’s (1950) samples, Christie (1954) inferred that these individuals scored low on the F-scale; further, he interpreted this as evidence that the F-scale is not equipped to detect left-wing authoritarianism, which he saw as a very real concern.

Spurred by what he viewed as an asymmetrical account of authoritarianism by Adorno et al. (1950), Rokeach (1960) contended that mental rigidity, dogmatism, and close-mindedness were not exclusive to political conservatives; rather, that these features appropriately characterized individuals at either extreme of the ideological spectrum. Rokeach argued that dogmatism and close-mindedness provided a robust cognitive framework upon which to construct and interpret one's social world, thereby warding off the anxiety of uncertainty and satisfying one's need to understand the world (or at least to feel as if one understands it). The certainty afforded by black and white thinking, mental rigidity, and resistance to change would presumably be equally appealing for those at either end of the political spectrum as a means of preserving and protecting the values and identity that one holds dear. To this end, Rokeach (1960) developed a measure of "general conservatism" or dogmatism, which he labeled the D-scale. This measure sought to identify individuals – at any point on the ideological continuum – who exhibited mental rigidity, intolerance of alternative views, and stubborn adherence to their ideological beliefs.

Barker (1963) compared scores on the F-scale (Adorno et al., 1950) to scores on the D-scale (Rokeach, 1960) to examine the relation between the scales and the prevalence of authoritarianism on the political right, left, and center. Using a sample of New York area graduate students, Barker (1963) found that, although high F-scores were particular to right-leaning individuals, political leftists, rightists, and centrists did not differ in their dogmatism (D) scores. Barker (1963) concluded that dogmatists on both the right and the left were more likely than low D-scorers to voice strong opinions and to favor the censoring of the opposing side's view.

A study conducted by Smithers and Lobley (1978) provides additional evidence that dogmatism is not a uniquely right-wing phenomenon. The researchers administered a series of opinion questions, as well as Rokeach's dogmatism (D) scale and Eysenck's radicalism (R) scale, to a large sample of British college students. Results indicated that the dogmatism scores of extreme leftist radicals (i.e., those who scored high on the R-scale) were virtually indistinguishable from the D-scores of extreme conservatives. Smithers and Lobley (1978) concluded that dogmatism looks and behaves very similarly in those at the ideological extremes, be they radical or reactionary.

More recently, Greenberg and Jonas (2003) took issue with Jost et al.'s (2003a) claim that motivations to avoid fear and reduce uncertainty underlie conservatism but not liberalism. Citing historical examples of conservative movements that seemed to advocate change (e.g., Hitler's Nazism, Mussolini's Fascism) and leftist regimes that have resisted change and tolerated inequality (e.g., Soviet Union, Communist China), Greenberg and Jonas (2003) contended that motives to reduce fear and uncertainty can be – and are – served just as well by left-wing orientations as by right-wing ones. The researchers focused particular attention on authoritarianism and dogmatism in communist countries, arguing that staunch supporters of established, leftist regimes are often just as ardent in their defense of the status quo and intolerance of out-groups and deviants as the rigid conservatives highlighted by Jost et al. (2003a). Based on these cases, Greenberg and Jonas (2003) proposed a two-factor model of ideology, wherein ideological content (i.e., right-wing v. left-wing) and ideological rigidity function as independent, orthogonal dimensions. The researchers argued that high levels of rigidity and dogmatism were equally likely among those adhering to leftist and rightist

ideologies, especially when one considers political movements and regimes beyond those found in the United States.

### **Right-Wing Rigidity versus Ideological Extremity**

The debate surrounding the proper conceptualization of the differences between liberals and conservatives continues to rage. Indeed, the literature is so clouded that the work of several groups of researchers is difficult to categorize as exclusively supportive of one side or the other. A few have actually espoused different positions on the issue over the course of their programs of study. For instance, although Eysenck (1954) contended that liberalism and conservatism were based on different levels of extraversion and sensation-seeking (with conservatives being less open), he also proposed a two-factor model of political orientation comprised of the radicalism (R) of political-economic attitudes (traditional, right-to-left continuum) and “tough-mindedness” versus “tender-mindedness” (T). Eysenck argued that the independent nature of the R and T factors allowed for the existence of “tough-minded” liberals and “tender-minded” conservatives.

Similarly, Huntington’s (1957) conceptualization of conservatism as situationally determined seems to lend credence to both sides of the debate. Huntington (1957) contended that underlying individual differences between political liberals and conservatives do exist, in terms of preference for existing institutions and inequalities. However, he also theorized that, because conservatism was situational, political liberals could, paradoxically, end up thinking and behaving as conservatives when the established regime was itself left-leaning and/or challenges to established equality and fairness threatened these tenets of the liberal ideal.

In explaining the implications of their work on terror management theory (TMT) and ideology, Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992) contended that mortality

salience need not give rise to political conservatism exclusively. Although earlier work (e.g., Greenberg, Pyszczynski, & Solomon, 1986) found evidence of a “conservative shift” in terms of prejudice toward out-groups following a mortality salience manipulation, Greenberg and colleagues (1992) argued that reminders of death can lead to the defense of whichever ideological view, liberal *or* conservative, the individual held dear. Empirical studies have shown that, when forced to imagine their mortality, liberal and conservative individuals react differently. Among conservatives, exposure to death reminders has been shown to lead to increased support for the use of military force (Pyszczynski et al., 2006), heightened prejudice toward out-group members (e.g., Greenberg & Kosloff, 2008), and greater endorsement of conservative stances on moral issues such as abortion rights (Weise, Pyszczynski, Rothschild, & Greenberg, 2007, cited in Anson, Pyszczynski, Solomon & Greenberg, 2009). In contrast, mortality salience inductions show mixed results among liberals. In some studies (e.g., Weise, Arcizewski, Verhilliac, Pyszczynski, & Greenberg 2007, cited in Anson et al., 2007), death reminders gave rise to “liberal shifts” (i.e., increased importance placed on liberal moral issues such as gay marriage and affirmative action), but in others (e.g., Weise, Pyszczynski, et al., 2007), no significant shifts – in a liberal OR conservative direction – were found among political liberals. Studies pertaining to terror management theory suggest that individuals react to and buffer against mortality salience in different ways based upon their ideological belief systems.

Amid their studies of the relationship between conservatism and openness to experience, van Hiel et al. (2000) uncovered a few subsamples in which the overall negative correlation with political conservatism did not emerge. Specifically, the researchers’ sample of Polish adults showed a much weaker negative correlation between openness and conservatism. Van Hiel and colleagues (2000) suggested that this attenuation could be due to Poland’s history of and

transition from Communist (leftist) rule. In addition, members of both leftist and rightist Flemish political parties did not show the overall negative correlation between conservatism and openness, as was found in the other Flemish samples. This finding (or lack thereof) could be interpreted as evidence that ideological extremism, and not necessarily conservatism, is characterized by less openness.

The debate between the “rigidity of the right” and “ideological extremism” hypotheses has raged for nearly as long as the study of differences underlying political conservatives and liberals and shows little sign of abating (e.g., Jost et al., 2003a, 2003b; Greenberg & Jonas, 2003). Research over more than six decades and across myriad domains has produced no consensus in terms of whether resistance to change, dogmatism, and close-mindedness are more appropriately conceptualized as characteristic of the ideologically right-leaning or the ideologically extreme. One means of shining light on this debate is to focus directly on one of the elements at its core: reactions to persuasive communications. Much research surrounding ideological differences has focused on general propensities to entertain versus reject alternative points of view (e.g., Frenkel-Brunswik, 1949; Rokeach, 1960; van Hiel et al., 2000; Jost et al., 2003a, 2003b). However, comparatively little work has focused specifically on how liberals versus conservatives react to targeted attempts to change their attitudes. Although the “rigidity of the right” and “ideological extremism” approaches lead to divergent predictions regarding whose attitudes would be susceptible versus resistant to change, to date no studies have directly examined how one’s ideology and prior attitudes influence his or her reactions to persuasion attempts. Work surrounding attitude change and persuasion may provide much-needed insight into the patterns and predictors of attitude change versus resistance among political liberals and conservatives.



## **Attitude Polarization: What Explains “When Persuasion Backfires”?**

Within psychology, there has been a lengthy history of empirical investigation into the causes and consequences of resistance to persuasion. As early as the 1930s, researchers investigating social and political attitudes uncovered paradoxical patterns of attitude change, particularly following exposure to “both sides” of an issue. Thouless’s examinations of fervent religious beliefs led him to develop the “Principle of Certainty,” which held that individuals’ initial acceptance or rejection of a religious belief came to be defended with even more conviction following exposure to “influences acting both in the direction of acceptance and of rejection” (Thouless, 1935, p. 24). Instead of having a “sobering” or moderating effect on religious attitudes such that the majority of individuals came to hold their original attitude with *less* conviction, mixed evidence gave rise to a marked split in opinion, with individuals becoming *more* assured of their initial attitude following its presentation. In a similar vein, Thurstone’s (1945) comparison of attitudes at various stages of political campaigns revealed that the attitudinal distribution took on a distinctly bimodal character as campaigns neared their end. This suggested that, as the campaign progressed, the presentations of multiple issue positions and varying views on the candidates’ merits actually led the populace (in the aggregate) to adopt more polarized positions on the candidates and issues. These early investigations suggested that, once formed, social and political attitudes could be extremely resistant to change, even when the attitude holder was confronted with a seemingly balanced presentation of supporting and opposing evidence.

Later work into group-level attitude change built upon and clarified the findings of Thouless and Thurstone. Studies along these lines uncovered not only propensities to resist the alteration of initial attitudes in response to persuasive messages but also instances in which

attitudes actually shifted “outward,” becoming even more extreme in terms of positivity or negativity. The term “attitude polarization” came to describe this increase in the extremity of attitudes from their initial starting position and has received frequent and varied empirical treatment among researchers in domains ranging from impression formation to political campaigning.

**Discussion-induced polarization.** An early investigation into discussion-induced attitude polarization among small groups was conducted by Myers (1975). In two studies, participants formed small groups, read information about pay raise recommendations for hypothetical faculty members (Study 1) or attitudes toward women (Study 2), and provided preliminary pay raise recommendations or attitudes toward women. Next, groups were instructed to carefully discuss the information provided and the general issue at hand. After approximately ten minutes of discussion, each group’s recommendation for faculty pay raises (Study 1) or attitude toward women (Study 2) was again assessed. Myers (1975) found that the most polarization (i.e., outward shift in attitudes) occurred following discussions in like-minded, homogeneous groups, suggesting that discussion in such groups served to bolster the group’s unanimous opinion via either social comparison among individual discussants or informational influence. Myers’ (1975) work indicates that exposure to and immersion in one point of view on an issue – one that you happen to already support – could lead to an “outward” shift in group-level attitudes. Of note, however, is that Myers (1975) did not assess the degree or direction of attitude change at the individual level but focused instead on the aggregate outcome of group discussion.

More recently, Baron et al. (1996) investigated the role of social corroboration in promoting opinion extremity. The researchers hypothesized that receiving corroboration of a

categorical position on a particular issue would lead people to have more confidence in their choice, which in turn would lead them to endorse it more strongly than they originally did (i.e., attitude polarization). The researchers demonstrated that participants became more extreme (i.e., shifted outward in the same direction as their starting attitude) in their ratings of a target's attractiveness, as well as pledged more money to charity, after having experienced social corroboration of their categorical stances and judgments. Baron et al. (1996) also found evidence that the relationship between social corroboration and opinion extremity was partially mediated by confidence: Individuals who had received corroboration of their categorical views were more certain of their position/rating and therefore came to endorse that position or rating even more strongly than they had initially. Importantly, these studies demonstrated that polarization in a group setting can and does occur even in the absence of a) the sharing of novel persuasive information (informational influence) or b) the comparison of specific, quantitative positions or attitudes (social comparison).

**Thought-induced polarization.** In addition to Myers' investigations of group polarization, other noted psychologists were attempting to tackle issues related to judgments, attributions, and attitude change at the individual level. Beginning in the mid-1970s, Tesser and colleagues examined attitude polarization in light of its relationship to deliberation and the generation of relevant thoughts. For example, Tesser and Cowan (1975) assessed the effect of thought versus distraction on impressions of hypothetical individuals based on trait adjective descriptions. Participants first saw descriptions of hypothetical people (that contained either four or eight adjectives) and provided an initial likeability rating of these target individuals on a scale ranging from -7 (dislike strongly) to +7 (like strongly). Next, two individuals for whom they had reported moderately positive attitudes (i.e., +3 to +4) and two who had been rated moderately

negatively (i.e., -3 to -4) were selected for further consideration. For each target, participants were instructed to form an impression based on the adjective descriptions provided. Half of the participants then spent ninety seconds concentrating on and thinking about the target individual (thought condition); the other half worked on unrelated multiple choice items for the same period of time. After the ninety seconds had elapsed, all participants rated the target's likeability again, on the same scale as was presented originally.

Results revealed a main effect for thought, such that participants who had engaged in deliberative thought about the target person between initial and posttest attitude assessments demonstrated greater attitude polarization than did the distracted participants. In addition, Tesser and Cowan (1975) found that those who had been presented with fewer adjectives initially reported greater polarization and felt that they had "gone beyond the information given" more so than did individuals who were provided with more adjectives. The researchers took this as support for a meditational explanation of the link between thought and polarization called the "thought-generation hypothesis." According to Tesser and Cowan (1975), increased thought about an attitude object leads to the generation of new cognitions that are consistent with (i.e., in the same direction as) the originally held attitude. These additional thoughts serve to strengthen the basis of the initial attitude, thereby giving rise to evaluative shifts outward following the deliberation process. For Tesser (1976) and colleagues (e.g., Tesser and Cowan, 1975) then, an increase in (evaluatively consistent) thoughts about a target explained the observed polarization in attitudes about it.

**Information-induced polarization.** Other researchers posited different underlying mechanisms to explain attitude polarization. To investigate if and why "first impressions" carry such weight in our processing of subsequent information, Ross, Lepper, and Hubbard (1975)

conducted a series of interesting studies employing false feedback and debriefing. Participants first completed a novel task that involved reading several suicide notes and choosing which were real and which were created by the experimenters as a ruse. Next, participants randomly received feedback stating that they were either more or less successful than “the average student” at differentiating real from fake notes. Shortly after having received this false feedback, participants were debriefed: The experimenter told them, in no uncertain terms, that the performance feedback previously provided was completely bogus, randomly assigned, and not at all indicative of their performance on the novel task. Following this disclosure, participants were asked to rate their performance on the suicide note detection task, how successful they believed they would be on similar tasks in the future, and how they felt their performance “stacked up” to the average participant in the study. The experimenters also had participant observers watch others perform the novel task and receive feedback, as well as hear the debriefing that explained the irrelevance of the performance feedback. Results showed that both actors’ and observers’ perceptions of the actor’s success or failure based upon the phony feedback persisted, even after being explicitly told via debriefing that the feedback was entirely invalid. That is, those who originally received “success” feedback rated their (the actor’s) performance as better than average, whereas individuals who had been provided with “failure” feedback reported that they (the actor) did worse than average. Ross and colleagues (1975) coined the term “perseverance effect” to describe this propensity to cling to initial impressions of oneself and others, even when given definitive information that the basis for that perception is incorrect. The researchers found that a standard “outcome” debriefing was not sufficient to correct participants’ perceptions; the only thing that “undid” the effect of the phony feedback on actors’ and observers’ judgments was

a process debriefing, which entailed explaining not only that the performance feedback was fake but also that erroneous perceptions can persist even after debriefing.

In attempting to explain the perseverance effect, Ross and colleagues (1975) introduced the concept of biased processing as a potential underlying mechanism. The researchers hypothesized that, once individuals had received the faulty feedback, their subsequent views of their (or the actor's) performance were indelibly colored by that feedback, such that even being told that the performance information was phony did not effectively remove the lens through which participants saw themselves (or others). Ross et al. (1975) posited that this biased processing of information about the self and others was pervasive and quite ubiquitous, permeating perceptions of ourselves and the social world around us. Also, in the case of these studies, even a debriefing process that explicitly and directly discounted the validity of the prior information participants had received was insufficient to offset the perseverance effect. The researchers noted, somewhat somberly, that real-world information is very rarely as unequivocal or clear-cut as the debriefing procedure had been. If people's perceptions and attributions can persist in the face of definitive evidence of their erroneousness, what would we expect to occur outside of the lab setting, in which information challenging our prior beliefs about ourselves and others is generally much more ambiguous?

Building upon work related to the layman's "shortcomings as an intuitive scientist" (Ross, 1977) and belief perseverance (Ross et al., 1975), Lord, Ross, and Lepper (1979) conducted a now classic series of studies investigating attitude polarization via biased assimilation. Lord et al. (1979) noted that, although exposing someone to both sides of an issue is an intuitively appealing way to elicit more balanced views on the topic, the presentation of mixed evidence can actually lead to a deeper entrenching and polarizing of original attitudes.

Specifically, the researchers posited that the presentation of a mix of both supporting and opposing views on a particular issue would lead those who held extreme views initially to adopt an even more extreme evaluative stance due to the biased assimilation of the “balanced” persuasive information. Lord et al. (1979) held that several biased assimilation processes might be at work: Individuals might remember the strengths of supporting evidence but the weaknesses of the opposing evidence; they might gauge supporting evidence as more relevant or reliable but dismiss the “other side’s” arguments as irrelevant or unreliable; they might accept supporting evidence at face value but scrutinize the opposing evidence deeply with an eye toward finding flaws; and/or they could interpret limitations in the opposing arguments as necessarily indicative of the correctness of the evidence supporting their stance. Whatever the particular process(es) at work for an individual, Lord et al. (1979) believed that the outcome would be the same: This biased assimilation of ostensibly balanced information would lead to attitude polarization among those with extreme attitudes.

To test the relationship between attitude extremity and subsequent polarization, the researchers first assessed participants’ attitudes toward capital punishment to identify those who reported established pro-deterrence or established anti-deterrence attitudes. Participants were considered proponents if they favored capital punishment, believed that it had a deterrent effect, and felt that their opinion was supported by current research; those who opposed capital punishment, doubted its effectiveness as a deterrent, and thought that relevant research supported *their* view were labeled “opponents.” Both proponents and opponents were subsequently presented with the general results of, as well as more detailed information about and refutations of, two studies: one whose findings supported the effectiveness of capital punishment and one that denounced its effectiveness as a deterrent. After having read the information provided about

both studies, participants were asked to rate the quality of each study, as well as to evaluate their current attitude toward capital punishment relative to the one they had expressed at the outset of the study. Lord et al. (1979) found evidence of both biased assimilation and attitude polarization. First, participants who were pro-capital punishment initially viewed the pro-deterrence study as more sound, valid, and convincing than the anti-deterrence study; the exact opposite evaluative pattern was found among anti-capital punishment participants. As both sets of participants had actually read the same mix of information and had come to such divergent conclusions regarding the studies' relative merit, Lord et al. (1979) took this as evidence of biased assimilation (i.e., individuals processing the information based upon their pre-existing attitudes about the issue of capital punishment). Second, analyses of the link between initial attitude and self-reported attitude change provided evidence of self-reported attitude polarization. That is, pro-capital punishment participants felt that they were now even more positive about capital punishment, whereas anti-capital punishment participants reported that their attitudes had become even more negative than they were initially.

The foundations laid by Lord et al. (1979) and by Tesser (e.g., Tesser & Cowan, 1975; Tesser, 1976) firmly established the phenomenon of attitude polarization as a legitimate occurrence with sweeping practical implications, as well as a fertile area of empirical study. In 1993, Miller, McHoskey, Bane, and Dowd conducted a series of studies aimed at qualifying and clarifying the process and scope of attitude polarization as defined by these two camps. This work extended our knowledge of attitude polarization in two important ways. First, in both Lord et al.'s (1979) and Tesser's (1976) procedures, polarization was operationalized as participants' self-reported attitude change from the beginning of the study to the end. Noting that self-assessed change and objectively determined movement were two different things, Miller and



colleagues (1993) compared self-reported attitude change to directly assessed change or polarization via a “trinary index” (i.e., comparison of posttest to pretest scores with +1 = polarization, -1 = depolarization, and 0 = no change). Second, in an effort to gauge the practical significance and outcomes of holding extreme or polarized attitudes, Miller and colleagues (1993) assessed a behavioral consequence of attitude polarization: the strength and persuasiveness of essays. Participants wrote an essay explaining their attitudinal stance on a target issue, and these essays were subsequently rated in terms of convincingness and strength by both the participant him- or herself (Study 3) and an independent reader (Study 4) in order to determine if essays written by individuals who reported attitude polarization were more persuasive than those of individuals who reported attitude depolarization.

Miller et al. (1993) first assessed individual’s attitudes toward capital punishment (Studies 1 and 2) or affirmative action (Study 3) on a scale ranging from -50 (extreme disagreement) to +50 (extreme agreement) to determine the direction (positive/negative) and extremity (moderate/extreme) of their initial attitudes. From this continuous scale, the researchers created four categories related to valence and extremity: attitudes between -36 and -50 were considered “extreme anti,” those between -1 and -35 as “moderate anti,” between +1 and +35 as “moderate pro,” and between +36 and +50 as “extreme pro.” Next, participants read arguments supporting both the pro- side and the anti- side of the issue at hand (as in Lord et al., 1979), rated their perceived change in attitudes since the outset, and directly evaluated the issue as they had at the beginning of the study. In Studies 2 and 3, participants then wrote an essay either supporting or opposing the target issue and rated the convincingness of that essay; in Study 4, other participants read and evaluated the previously written essays to provide an observer’s perspective on the essay’s persuasiveness. Several interesting findings emerged.

First, Miller et al. (1993) found evidence of biased assimilation: Proponents of the target issue found the pro- arguments to be more valid and convincing than the anti- arguments, and vice versa for those who opposed the target issue. This preference for “my side’s” arguments was more pronounced among participants with extreme views than among moderates. Second, evidence of self-reported attitude change and polarization was found, with extreme individuals generally reporting that their attitudes had become even more positive (or negative) than at the outset but moderate participants reporting a depolarization, or change in the opposite evaluative direction, of their initial views. Correlational analyses revealed a significant positive relation between biased assimilation and self-reported polarization as well. However, in examining actual difference scores (i.e., post-attitude minus pre-attitude), no evidence of attitude polarization among “extremists” was found; only moderate participants demonstrated an actual “outward” shift in their attitudes relative to their starting position. Finally, an investigation of the link between extremity/polarization and the persuasiveness of participants’ essays revealed that polarization was not significantly predictive of perceived essay quality or strength, suggesting that the behavioral consequences of attitude polarization were minimal.

From these studies, Miller et al. (1993) reasoned that both information-induced attitude polarization (e.g., Lord et al., 1979) and thought-induced attitude polarization (e.g., Tesser, 1976) are based, at least in part, on biased processing and assimilation of mixed persuasive information. Given the discrepancy in their results based upon self-reported and directly assessed attitude polarization, Miller and colleagues (1993) cautioned against an overly broad generalization of Lord et al.’s (1979) findings and conclusions. Interestingly, the researchers did not find nearly as much evidence of attitude polarization in Study 3, in which the target issue was affirmative action. As a potential explanation, Miller and colleagues (1993) offered Liberman

and Chaiken's (1991) value-conflict hypothesis, which posits that an attitude object that makes salient two important but conflicting values will also bring to mind thoughts that are evaluatively inconsistent; these ambivalent evaluations could essentially counteract one another, resulting in relatively little polarization.

In response to work surrounding information-induced and thought-induced attitude polarization, Harton and Latané (1997) investigated the role of issue involvement as a common underlying feature that could explain both forms of the phenomenon. The "catastrophe theory of attitudes" (Latané & Nowak, 1994) posits that not all attitudes are properly conceptualized as continuous constructs. Whereas moderate attitudes are continuous in the sense that information can sway people's evaluations to become slightly more or less favorable, extreme attitudes are, in essence, categorical in that one is either extremely positive or negative with no proverbial middle ground representing an acceptable attitudinal position. Harton and Latané (1997) posited that this "catastrophic" difference in the workings of moderate versus extreme attitudes was due to increased issue involvement or importance in the latter case. If it is the importance one places on a particular issue that determines whether his or her attitudes will depolarize or polarize, then any process that heightens issue involvement should, theoretically, result in polarization. That is, both information (Lord et al., 1979) and deliberation (Tesser, 1976) could presumably give rise to attitude polarization, insofar as one feels that the target issue is important or personally relevant.

To examine this mediational model, Harton and Latané (1997) compared thought-induced and information-induced attitude polarization, as measured via pretest-posttest difference scores. At the outset of the studies, participants provided their initial attitudes about several social issues (e.g., school vouchers, minority-preference programs) on scales ranging

from -7 (extremely negative) to +7 (extremely positive). Next, participants either rated the issues again (control), read mixed evidence about the issues (information), thought carefully about the good and bad aspects of the issues (thought), or read mixed evidence and deliberated on the issues (read + thought). Harton and Latané (1997) found that reading mixed evidence increased both issue involvement and attitude polarization; moreover, involvement mediated the relationship between information exposure and polarization. The researchers found more polarization (in terms of difference scores) among individuals who initially viewed the issues as less important than among those who viewed the issues as highly important at the outset. Harton and Latané (1997) interpreted this pattern as evidence that increases in issue involvement, and not simply baseline levels of involvement, affect the degree of subsequent attitude polarization. Finally, the results indicated that thought alone did not increase importance or increase the extremity of one's attitudes, although the combined thought and information condition showed levels of importance and extremity that approximated the information only condition. From this, Harton and Latané (1997) concluded that information-induced polarization (e.g., Lord et al., 1979) might be more common than thought-induced polarization (e.g., Tesser, 1976), at least in part because exposure to a mix of information appeared to increase issue involvement to a greater extent than did simply thinking about the issue at hand.

**Biased assimilation in applied contexts.** In the past decade, several groups of researchers have examined the phenomena of biased assimilation and subsequent attitude polarization with an eye toward more closely approximating real-world considerations such as the presentation of and selective exposure to relevant information and attitudes toward stigmatized groups or topics. As information relevant to a particular real-world judgment is usually not all available at once, Jonas, Schulz-Hardt, Frey, and Thelen (2001) examined the

ways in which information is encountered, selected, and processed sequentially. Specifically, the researchers were interested in determining if and how conformational biases (i.e., selecting view-supporting information to a greater extent than view-opposing information) occur in a sequential search for information. In response to a study prompt, participants initially decided whether or not alternative healing methods should be covered by health insurance. Next, they had the opportunity to select and read a mix of articles supporting and opposing the inclusion of alternative methods in health coverage in one of two ways: They either selected and read articles one at a time (sequential condition) or selected and read articles that were presented on an exhaustive list (simultaneous condition). Afterward, participants were asked to make a final decision concerning the proposed extension of health insurance. Jonas et al. (2001) found that participants in the sequential condition demonstrated a larger confirmation bias than did those in the simultaneous condition. That is, individuals who selected informational articles one by one were much more likely to choose more articles that supported instead of opposed their initial view than were participants who chose their desired information from the exhaustive list. The researchers posited that the sequential presentation of information could have primed a “decision focus” in participants, such that each new piece of information was compared to both their initial decision and the prior accumulated information, which contributed to a greater focus on view-supporting evidence. In contrast, those in the simultaneous presentation condition may have adopted an “information focus,” in which processing was geared toward the connection and integration of information. Jonas and colleagues (2001) felt that this more equal consideration of evidence in the interest of generating a coherent and integrated view could explain why the confirmation bias was less pronounced under conditions of simultaneous information presentation. From this, the researchers warned that biased processing in a real-world setting

might be even more prevalent than expected, given the sequential nature of information presentation and selection.

In a related series of studies, Fischer, Jonas, Frey, and Schulz-Hardt (2005) investigated the effects of restricted information search and selective exposure as a means of testing the nature and prevalence of biased information search under conditions of “limited” information. Participants read a mix of positive and negative facts about a hypothetical employee and made a preliminary decision about whether his contract should be extended or not. Following their decision, participants were presented with the “gist” of several additional pieces of information about the employee, half of which supported his continuation and half of which did not. Participants were then asked to decide which of the additional snippets of information to read. Results showed that, when information was restricted (i.e., participants could select only a certain number of snippets to read), participants conducted a biased information search, in that they selected more arguments that supported their preliminary decision than those that opposed it. Subsequent studies supported Fischer et al.’s (2005) cognitive mediation explanation for the findings. In essence, knowing that their information search was restricted prompted participants to seek out what they thought to be the highest quality information; relying on the assumption/heuristic that information supporting “my view” is of better quality, participants then over-selected supporting information and under-selected opposing information. Interestingly, this confirmation bias did not emerge for individuals placed under cognitive load, indicating that, paradoxically, an interruption of people’s ability to seek out “quality information” may actually lead them to be more balanced and fair in their selective exposure to persuasive arguments.

More recently, Boysen and Vogel have demonstrated the presence and implications of biased assimilation and attitude polarization in the meaningful real-world context of attributions

for stigmatized behaviors. Generally speaking, stigmatized behaviors that are attributable to biological causes (e.g., genetics, chemical and hormonal levels) are perceived less negatively than those attributable to “mere” psychological causes (e.g., stress, family support systems), in large part due to perceptions of intent or control. However, Boysen and Vogel (2007) posited that simply providing a biological explanation for something like homosexuality would not necessarily lead to greater positivity among all people, as experimental studies aimed at reducing negative attitudes toward homosexuality by offering biological explanations have produced mixed results. Boysen and Vogel (2007) predicted that the extremity of one’s pre-existing attitudes could determine whether this biological explanation resulted in more favorable attitudes or greater resistance and polarization. Specifically, the researchers predicted that those who held extremely negative attitudes toward homosexuality initially would be less likely to view the biological explanations as persuasive evidence due to biased processing and/or outright rejection of the counterattitudinal message. The end result could well be a deeper entrenchment of negative attitudes toward homosexuality.

To examine the relationships among attitude extremity, biased processing, and attitude polarization in response to biological explanations of homosexuality, Boysen and Vogel (2007) had participants report their initial attitudes toward homosexuality, read short essays providing biological explanations for it, and then report the degree (and direction) to which they felt their attitudes had changed since the outset of the study (i.e., self-reported attitude change). As predicted, results revealed a significant direction by extremity interaction, such that those with extreme negative attitudes reported that their attitudes had actually become more negative, whereas those with moderately negative, moderately positive, and extremely positive initial attitudes all reported at least slightly positive change. In keeping with past work in the attitude

polarization tradition, it seems that the persuasive evidence presented (i.e., biological explanations of homosexuality) was filtered through the lens of participants' pre-existing attitudes, such that people viewed the information provided as supporting their view, regardless of whether they were extremely negative or relatively more positive.

In another, closely related set of studies, Boysen and Vogel (2008) investigated biased assimilation and attitude polarization in regards to mental health stigmas. After providing their initial attitudes of either a low-control mental health condition (schizophrenia) or a high-control condition (addiction), participants read and evaluated "educational information" about the stigmatized condition that was comprised of either biological or psychosocial explanations. They then self-reported the extent and direction of any change in their attitudes after having read the information. As in their earlier study, Boysen and Vogel (2008) found that the educational information was processed and used differently by those who had relatively negative or positive initial attitudes. That is, those with negative initial attitudes saw the educational information as supportive of their negative view (biased assimilation) and felt that their attitudes had become more negative (attitude polarization); participants with positive attitudes at the outset viewed the information as supportive of their positive opinions and polarized in a positive direction.

Empirical investigations into the phenomenon of attitude polarization have examined many factors underlying resistance to persuasion and outward shifts in evaluative stance. Early work (e.g., Thouless, 1938; Myers, 1975) focused primarily upon attitude change at the group level and how deliberation among heterogeneous versus homogeneous groups of individuals led to more or less group polarization. Later studies explored attitude polarization at the individual level; in particular, the effects of initial attitude extremity, biased assimilation of mixed evidence (Lord et al., 1979), cognitive deliberation (Tesser, 1978), and issue involvement (Harton &



Latané, 1997) were subjected to empirical scrutiny in a variety of contexts. Work by Miller et al. (1993) helped to clarify and fine-tune the methodological and analytic procedures for assessing and interpreting attitude polarization, as well as assessed a potential behavioral consequence of attitude polarization, the convincingness of subsequently written essays. This body of work establishes attitude polarization as a real phenomenon, with known antecedents and predictable and meaningful consequences.

### **Integrating Political Ideology and Attitude Polarization**

Both political ideology and attitude polarization have a lengthy and rich history of empirical study within social psychology. Despite this, a great deal of uncertainty and lack of consensus remains, particularly within the ideological tradition. As one element associated with ideological distinctions between the right and left is amenability versus resistance to change and persuasion, it seems that the findings coming out of the attitude polarization tradition might serve as a worthwhile topic of investigation within the ideology framework. If, as researchers advocating the “rigidity of the right” contend, conservatives are more resistant to change and less tolerant of opposing views than are liberals, one would expect greater propensities toward attitude polarization among those on the political right as compared to those on the left. In contrast, if ideological extremity of either flavor is equally well-characterized by resistance to persuasion and change, one would expect equally high levels of polarization among extreme leftists and rightists. It would seem that the attitude polarization literature offers a means of further explaining differences between the ideological left and right, or between ideological extremists and moderates. A few recent lines of empirical investigation have endeavored to combine the realms of ideology and attitude polarization in an attempt to better our understanding of both.

Recently, work has sought to demonstrate the antecedents and consequences of extreme attitudes in a political context. Binder, Dalrymple, Brossard, and Scheufele (2009) examined the relationship between informal discussion networks and extreme attitudes toward a controversial socio-political issue, stem cell research, during the 2004 U.S. presidential campaign. Interestingly, Binder and colleagues (2009) focused not only on how political talk could instigate the development of extreme attitudes but also whether holding extreme attitudes affected individuals' roles and influence in their discussion networks, as they hypothesized that extremity may be both an impetus for and product of group discussions. Using data from the "Life Style Study," a national mail survey conducted in three waves (Feb 2002, Nov 2004, June-July 2005), Binder et al. (2009) specified and compared causal models of both the "discussion → extremity" and the "extremity → discussion" relations using structural equation modeling. Model comparisons yielded support for both relationships. As predicted, individuals who reported more extreme attitudes toward stem cell research in the first wave later reported being (actively) involved in informal political discussions. Although Binder et al. (2009) did find evidence supporting the link between political discussions and the development of more extreme attitudes, this relationship was moderated by the type of discussion network in which one took part. Specifically, those respondents who reported involvement in homogeneous, or like-minded, discussions in early waves of the study subsequently reported more extreme attitudes toward stem cell research. This finding is in keeping with past work on group polarization (e.g., Moscovici & Zavalloni, 1969; Myers, 1975) demonstrating that discussions with like-minded others drive the overall opinion of the group to become more extreme. Interestingly, Binder and colleagues (2009) found no significant link between heterogeneous discussion and attitude extremity. Binder et al.'s (2009) work represents a novel and meaningful application of attitude

polarization to real-world patterns of political discussion and attitude change. However, the use of secondary data limited the scope of the researchers' questions to those included in the Life Style Study data set. As such, Binder et al. (2009) could not examine many potentially important individual difference factors related to processing style and biased assimilation, variables shown to influence the degree to which extreme attitudes give rise to attitude polarization.

Work by Greitmeyer, Fischer, Frey, and Schultz-Hardt (2009) experimentally investigated the effect of both argument content and source identification on biased assimilation of political information and subsequent attitude polarization. The researchers hypothesized that biased assimilation could be due to not only the content of the arguments presented (i.e., supporting v. opposing one's opinion) but also the label of the source of that information (i.e., "my party" v. "the other side"). Drawing from work on social categorization and social identity (Tajfel & Turner, 1979), Greitmeyer et al. (2009) held that source position, even when conveyed implicitly, can communicate to a message recipient whether or not this is a valued, trusted source of information. In particular, ideological or party labels could serve as a cue or heuristic as to the reliability of the source and likely quality of the argument. The authors proposed that this source cue could be strong enough that individuals could end up agreeing more strongly with the "other side" of an issue than their own if the argument was credited to a source who shared their ideological leaning.

To test this, Greitmeyer and colleagues (2009) conducted two studies on non-student samples in Germany. Participants provided their attitudes toward and likelihood of voting for each of two prominent political parties (Christian Democratic Party – CDU, Social Democratic Party – SPD); read arguments from both parties on current issues such as the job market, health care, and education; rated the arguments themselves in terms of quality and persuasiveness; and

then reported their party attitudes again. Greitmeyer et al. (2009) manipulated the source label on the issue arguments, such that the arguments were attributed to the correct party (match), identified with the incorrect party (mismatch), or were not labeled (control). Results showed evidence of both biased assimilation and attitude polarization, but only for participants who had read arguments accompanied by correct source labels. That is, individuals who originally supported the SPD strongly became more favorable in their evaluations of that party, and those with initially positive attitudes toward CDU became more positive, but only in the condition in which the sources of the persuasive arguments were properly labeled. Moreover, Study 2 revealed that, when arguments were misidentified (i.e., SPD arguments attributed to CDU and vice versa), participants actually sided with their party label, regardless of argument content. For instance, SPD (CDU) supporters rated the statements under the SPD (CDU) label as more convincing, even though the statements had actually been made by the opposing party (CDU and SPD, respectively). This suggests that, as Greitmeyer et al. (2009) predicted, people were using the source labels provided as a cue to the quality and persuasiveness of the argument itself: So much so, in fact, that they reported preferring arguments whose content ran counter to their group's issue positions and values.

One major limitation of Greitmeyer et al.'s (2009) work for the current project is that the researchers did not assess the effect of either starting ideological position (although this could be inferred from participants' party attitudes) or the strength/extremity of their party allegiance. As these researchers conceptualized attitude extremity and polarization in terms of competence ratings, not issue attitudes, they did not examine the role of argument content in swaying or galvanizing initial opinions on these issues.

### **Purpose and Aim of Present Studies**

The primary focus of the present studies was to integrate two rich bodies of research within social psychology in an attempt to better understand the mechanisms underlying ideological differences in reactions to persuasive communication. Although much work has examined various psychological processes upon which ideological differences may be based, the question of whether propensities toward maintaining the status quo and endorsing inequality are primarily characteristic of a) political conservatives or b) ideological extremists remains hotly debated. Alongside this literature has emerged an extensive body of work surrounding the phenomenon of attitude polarization, suggesting that biased processing and assimilation (among other things) lead individuals with extreme attitudes to come away from “balanced” information even more deeply convinced of their point of view than they were initially. Biased assimilation and attitude polarization are psychological processes that have direct implications for our understanding of individual differences in attitude change versus resistance. One proposed distinguishing factor between liberals and conservatives has been just that: Do people respond to relevant information by considering it with an eye toward understanding (more open-minded), or do they instead remain “rooted” to their originally held beliefs and reject all evidence to the contrary without much consideration (close-minded)?

Before proceeding with a description of the current studies, it is important to explicitly operationalize two concepts of primary focus: attitude extremity and political conservatism. Throughout the history of the investigations of both attitude polarization and political ideology, different researchers have defined “extremity” and “conservatism” in a variety of related but by no means identical ways. This lack of clarity in operational definitions has almost surely contributed to some of the methodological and theoretical inconsistencies in both lines of research. For the purposes of the present studies, the term “attitude extremity” refers to the

proximity of an attitude to either the positive or negative endpoint of a standard semantic differential scale. Attitudes closer to the “outer edge” of the scale, in either evaluative direction, are considered more extreme; those closer to the center of the scale (i.e., evaluative neutrality) are considered more moderate. When discussing “conservatism” in the current studies, the term should be considered synonymous with political conservatism, or identification with the right side of the ideological continuum (as opposed to the left). This conceptualization differs from social, fiscal, religious, and general conservatism; neither is it synonymous with “Republican,” as the right side of the political spectrum is much broader than that encompassed by this single political party.

The present studies assessed the separate and interactive effects of political ideology and attitudinal extremity on subsequent attitude polarization (i.e., adopting a more extreme attitude of the same valence as the original evaluation) versus depolarization (i.e., becoming less evaluatively extreme). Including both elements as predictors of reactions to various types of persuasive communications allowed for a more accurate assessment of the relations among ideology, underlying attitudes, and the degree/direction of change. In addition, this project sought to better approximate the factors at work in “real-world” persuasive contexts such as politics. For instance, potential voters do not encounter and consider campaign messages in a proverbial vacuum. Instead, each person brings to the table both ideological allegiances and pre-existing attitudes about the candidates, the issues, the parties, etc. that create a unique and powerful lens through which any and all persuasive information is processed (Lord et al., 1979).

To examine the role of political ideology and attitude extremity on attitude polarization, a series of four studies was conducted assessing participants’ reactions to various arguments for and against pertinent social, economic, and political issues. Specifically, participants provided

their initial attitudes toward the issue in question, reported their ideological preferences, and received an equal number of pro- and anti- arguments. Then, they provided their attitude a second time after reading the mixed evidence arguments. In later studies, participants completed additional measures to examine potential mediators and control for covariates. Specifically, biased assimilation and factors proposed to differ between political conservatives and liberals (i.e., cognitive flexibility and need for cognitive closure) were examined as mediators. Need for cognition, importance placed on politics, and demographics were assessed as potential covariates. By incorporating a series of different target issues and assessing a variety of different individual characteristics across the studies, the extent to which result patterns generalized could be examined.

### **Hypotheses**

It was hypothesized that individuals holding extreme initial attitudes would be more likely to polarize (i.e., become more extreme) following the persuasive messages than would those holding more moderate views of the issues initially. Work on attitude polarization suggests that extreme pre-existing attitudes color the processing of subsequently presented information, such that individuals are likely to view supporting arguments as more convincing than opposing statements (e.g., Lord et al., 1979). This biased processing, in turn, leads such individuals to come away from the persuasive context with even more entrenched and extreme attitudes than they originally held; in contrast, more moderate individuals are more likely to demonstrate attitude change in the direction suggested by the persuasive information they encounter.

Second, based upon work on ideological differences by a variety of researchers (e.g., Jost et al., 2003a, 2003b; Adorno et al., 1950; Altemeyer, 1981), it was anticipated that political

conservatives would demonstrate more resistance to changing their attitudes in response to the persuasive essays. As past work has indicated that relative close-mindedness, intolerance for ambiguity, and rejection of novel or alternative viewpoints are characteristic of conservatism, it was hypothesized that conservatives would show more polarization of their attitudes, especially in response to information that opposes their views (e.g., arguments supporting tax increases), than would political liberals, whose relative open-mindedness and tolerance of ambiguity (Jost et al., 2003a, 2003b) was expected to give rise to more depolarization.

Third, attitude extremity and political ideology were expected to interactively affect attitude polarization. That is, the extent to which attitude extremity gave rise to subsequent polarization following exposure to a mix of supporting and opposing statements was predicted to differ for liberals versus conservatives. Political conservatives were expected to show evidence of attitude polarization, regardless of the extremity of their initial attitudes. Based on characterizations of the conservative “profile” as relatively intolerant, close-minded, and resistant to change (e.g., Jost et al., 2003a, 2003b), attitude polarization was expected to be observed among conservatives with moderate initial attitudes as well as among conservatives holding extreme initial attitudes.

Among liberals, however, the degree of attitude polarization was predicted to depend upon the extremity of their initial attitudes toward the target issue. As liberalism is generally associated with relative openness, tolerance, and preference for change (e.g., Jost et al., 2003a, 2003b), it was predicted that attitude extremity would be more predictive of attitude polarization. Liberals holding extreme attitudes at the outset were expected to show evidence of polarization, whereas liberals with more moderate attitudes toward the target issues were expected to be relatively open to depolarizing their opinions in response to the presentation of mixed evidence.



## Study 1

The first of the four studies conducted examined the effects of attitude extremity and political ideology on attitude change in response to mixed evidence about abortion rights. In this first study, participants indicated their attitudes toward the issue of abortion rights before and after reading an article containing a combination of statements supporting and opposing this social issue. Political ideology, as well as the importance of politics, were also assessed. Attitude change was assessed by examining the difference between participants' pre- and post-message attitudes. The purpose of this study was to examine how differences in individuals' initial attitudes and ideological positions affected their reactions to the persuasive messages. As such, there were a number of hypotheses that I tested.

**Hypothesis 1. Extremity of initial attitudes predicts attitude polarization.** Based upon work related to attitude polarization, it was hypothesized that individuals reporting more extreme attitudes toward abortion rights would demonstrate greater polarization of their attitudes than would those holding moderate initial attitudes, as evidenced by the difference between posttest and pretest attitudes. The findings of Lord et al. (1979) suggest that individuals espousing extreme support for or against a particular social issue are likely to come away from mixed evidence messages even more assured of their initial view, leading them to report even more extreme attitudes than they held initially. Furthermore, it was expected that, in comparison to those with extreme pretest attitudes, individuals displaying more moderate initial attitudes toward abortion rights would report depolarization of those evaluative views following exposure to the mixed evidence message. Miller and colleagues (1993) found that attitudinal moderates reported that their views on capital punishment had changed in the opposite direction from their

initially held attitudes following exposure to a mixture of statements supporting and opposing capital punishment.

**Hypothesis 2. Political ideology predicts attitude polarization.** Conservatives were expected to exhibit attitude polarization in response to the mixed evidence essays. Based on the extensive line of research demonstrating that political conservatives are more close-minded (e.g., Altemeyer, 1981), less open to new experiences (e.g., van Hiel et al., 2000), less tolerant of ambiguity (e.g., Frenkel-Brunswik, 1949), and more uncomfortable with uncertainty (e.g., Jost et al., 2003a, 2003b) than are political liberals, it was predicted that conservatives would demonstrate a propensity to resist changing their initially espoused attitudes toward abortion rights and would adopt an even more extreme attitudinal position than the one they originally held. Political liberals on the other hand were expected to demonstrate depolarization following the mix of pro- and anti-abortion rights statements. Relative to their conservative counterparts, liberal individuals are relatively more open-minded, tolerant, and accepting of change (e.g., Jost et al., 2003a, 2003b). Based on this, it was expected that liberals would be more apt to depolarize their initial views on abortion rights than would conservatives following the presentation of mixed evidence.

**Hypothesis 3. Attitude extremity and political ideology interactively affect attitude polarization.** The extent to which attitude extremity gave rise to subsequent polarization following exposure to a mix of supporting and opposing statements was predicted to depend upon political ideology. For political liberals, attitude extremity was expected to determine attitude polarization. As political liberalism is generally characterized by openness, tolerance, and preference for change (e.g., Jost et al., 2003a, 2003b), the extremity of a specific attitude was expected to determine a liberal individual's reaction to a mixed-evidence message, not his or her

ideology. Thus, it was hypothesized that liberals espousing extreme initial attitudes would demonstrate polarization after having read the mix of pro-life and pro-choice statements. In contrast, liberals holding more moderate abortion rights attitudes at the outset were expected to show evidence of depolarization in response to the mixed evidence. That is, among liberals, the relation between attitudinal extremity and subsequent evaluative change was expected to be consistent with work in the attitude polarization tradition (e.g., Lord et al., 1979).

Among political conservatives, no differences in attitude polarization were predicted based upon initial attitude extremity. As the conservative “profile” is characterized by greater intolerance, less openness, and greater resistance to change (e.g., Jost et al., 2003a, 2003b) than liberals, attitude polarization was expected to be observed among conservatives with moderate initial attitudes toward abortion rights as well as among conservatives holding extreme initial attitudes.

## **Method**

### **Participants**

Sixty-eight undergraduate students enrolled in psychology courses at Virginia Commonwealth University participated in the study for one hour of research credit. There were no exclusion criteria in regards to gender, race, or religious affiliation. The only requirements for participation were a minimum age of eighteen and fluency in English, as participants needed to be able to carefully read and evaluate written arguments. Six participants were excluded from analyses due to missing data or inappropriate completion (e.g., selecting the same response option for all items in a questionnaire containing reverse-coded items) of the study measures. The final sample was therefore comprised of sixty-two participants (forty-five women; 50% Caucasian, 16% Asian, 15% Black, 3% Hispanic, 2% Native American, and 14% “other”).

## Measures and Materials

**Pretest Attitudes Measure.** Participants' initial attitudes toward a variety of social issues were assessed using 7-point semantic differential scales ranging from -3 (negative) to +3 (positive; see Appendix A). Embedded in this series of questions was an item assessing views on the issue of abortion rights, which served as the pretest attitude assessment.

**Social Networking Sites Essay.** A series of statements describing the benefits and risks of using social networking sites was developed (Appendix B). Statements supporting social networking sites focused upon the ease of sharing ideas, meeting new people, and staying in contact with friends and acquaintances. Arguments opposing social networking sites emphasized the risks of divulging sensitive information that could adversely affect one's employment opportunities or leave one vulnerable to cyber crime. Messages were standardized in terms of length and content. The social networking sites essay was intended to a) familiarize participants with the study's primary task and b) make the study's premise – evaluating “a few” social issues – seem more credible.

**Abortion Rights Essay.** A series of statements supporting and opposing abortion rights was developed (see Appendix C). Statements supporting abortion rights centered on women's right to choose, family planning, and making abortions safer and rarer. Oppositional statements focused on an unborn child's right to life, traditional family values, and legal protections for the unborn. Arguments were adapted from the websites of organizations supporting abortion rights (e.g., Planned Parenthood) as well as those opposed to abortion rights (e.g., National Right to Life). Messages were standardized in terms of length and content, and the order of presentation of supporting and opposing statements was counterbalanced.

**Posttest Attitudes Measure.** Participants' posttest attitudes toward abortion rights were assessed using five semantic differential scales, ranging from -4 to +4, with the following endpoints: (a) dislike/like, (b) bad/good, (c) negative/positive, (d) unfavorable/favorable, and (e) against/in favor. All five attitude items were highly correlated ( $r$ s from .76 to .94) and internally reliable ( $\alpha = .97$ ). As such, these five items were averaged to create a composite variable assessing posttest attitudes toward abortion rights, with higher scores indicating more positive attitudes.

**Political Ideology Scale.** Political ideology was assessed using a composite scale adapted from those used by Shook and Fazio (2009) and Terrizzi, Shook, and Ventis (2010). Both Shook and Fazio's (2009) 13-item and Terrizzi et al.'s (2010) 31-item scales have demonstrated satisfactory reliability (Shook & Fazio, 2009,  $\alpha = .71$ ; Terrizzi et al., 2010,  $\alpha = .80$ ); these two scales were combined to enhance the overall reliability of the measure. The resulting 44-item scale, presented in Appendix D, contained a variety of questions assessing various aspects of political ideology. That is, whereas some items focused on a wide variety of social concerns (e.g., "Homosexuals should not be allowed to legally marry;" "Some crimes are so despicable that they should be punishable by death"), others addressed economic or financial issues (e.g., "Congress should not increase taxes, rather, they should decrease spending;" "The minimum wage should not be raised"). Participants indicated the extent to which they endorsed each item on a scale from -2 (Disagree strongly) to +2 (Agree strongly). In addition, self-reported political ideology was gauged by asking participants to rate themselves on a nine-point scale ranging from "as conservative as it gets" to "as liberal as it gets." After reverse-coding the self-reported ideology question and standardizing all items, the forty-five political ideology items

were averaged to create a composite variable representing political ideology ( $\alpha = .87$ ), with higher scores being indicative of a more conservative ideology.

**Importance of Politics Questionnaire.** As work by Petty and Cacioppo (1979) and Petty, Cacioppo, and Goldman (1981) has demonstrated, the degree of personal relevance that a particular topic has for an individual affects his or her motivation to cognitively elaborate on arguments surrounding it. In the current studies, it was important to assess how much participants cared about political issues, figures, and events in order to determine how relevant arguments supporting and opposing political issues would be. The importance participants placed on politics could moderate the effect of attitude extremity and/or political ideology on participants' attitudes toward the target issue. To assess this potential motivational factor, participants completed an "importance of politics" questionnaire (see Appendix E). This measure was comprised of three types of items designed to gauge the importance placed upon politics both directly and indirectly. Specifically, the measure contained a) four items directly assessing *importance* (e.g., "How important are political figures, issues, and events to you?"), b) three items assessing frequency of *political exposure* (e.g., "How often do you read about political figures, issues, and events?"), and c) eleven items assessing degree of *participation*, for which participants were asked to indicate whether or not they had taken part in several political activities, including voting, taking part in a march or rally, and contacting their congressional representatives. The number of political activities engaged in was then totaled for each participant to generate a summed political participation score. After standardization, all eighteen items were found to correlate positively with one another and demonstrated good internal consistency ( $\alpha = .85$ ). As such, they were averaged to form a composite variable assessing the importance of politics with higher numbers indicating greater importance.

**Demographics Questionnaire.** Finally, participants completed a demographics questionnaire (see Appendix F) assessing sex, marital status, ethnicity, religious affiliation, and hometown size.

## **Procedure**

Upon arrival at the lab, participants were seated at individual cubicles. Participants were informed that they would be taking part in a study about people's opinions on a variety of relevant social issues. They were informed of the confidentiality and anonymity of the study and were asked to sign an informed consent form. Participants were then told that they would be reading and carefully considering arguments about a few social issues, as well as completing a variety of questionnaires related to the issues and some other measures. First, they provided their attitudes about several issues, including the true attitudinal target, abortion rights. Next, participants read an essay comprised of statements supporting and opposing the use of social networking sites. They then responded to a few questions about social networking sites. Again, the social networking sites essay and questions were included simply to familiarize participants with the study's primary task (i.e., scrutinizing issue arguments and voicing their attitudes about those issues) and to bolster the cover story. Next, they were presented with a combination of mixed evidence supporting and opposing the target issue, abortion rights, and were instructed to read the statements as before. After participants had thoroughly read the arguments, their attitudes toward abortion rights were assessed using the posttest attitude measure. Participants then completed the following measures: Importance of Politics (IPQ), demographics, and Political Ideology (composite scale and self-identification item; PID). Participants were then debriefed. Any questions that participants had were addressed, and they were dismissed.

## **Results**

## Descriptive Statistics

Descriptive statistics for the primary variables of interest in Study 1 are presented in Table 1. Before proceeding with tests of the study's main hypotheses, it was necessary to ensure that the data met all assumptions of normality, linearity, and homogeneity of variance. Pretest attitudes toward abortion rights were found to be negatively skewed (Skewness = -1.78,  $SE = 0.30$ ). In order to correct for this, a log transformation was performed on the pretest abortion rights variable. Following transformation, the new variable demonstrated much improved fit statistics (Skewness = -0.25,  $SE = 0.30$ ), so subsequent analyses were conducted using this transformed variable. All other variables of interest were found to meet the assumptions of normality, linearity, and homogeneity of variance, making it appropriate to run analyses with these data in their original form. In particular, the composite measure of political ideology was not skewed (Skewness = 0.04,  $SE = 0.30$ ) and did not indicate any restriction of range or variability, indicating that the sample was not biased in terms of its ideological composition.

Table 1.

*Descriptive Statistics for Study 1*

Variable	<i>M (SD)</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>SE<sub>Sk</sub></i>
Pretest Abortion Rights Attitude	5.24 (1.98)	1.00	7.00	-1.78	0.30
Posttest Abortion Rights Attitude	6.08 (2.70)	1.00	9.00	-0.52	0.30
Political Ideology Composite <sup>1</sup>	2.46 (0.45)	1.43	4.43	0.03	0.30
Self-Identified Ideology <sup>1</sup>	4.16 (1.69)	1.00	8.00	0.54	0.30
Importance of Politics <sup>2</sup>	0.00 (0.70)	-1.89	1.32	0.00	0.30

<sup>1</sup> higher values = more conservative

<sup>2</sup> standardized composite



## Tests of Main Hypotheses

The main purpose of the current study was to test the effects of attitude extremity and political ideology on changes in attitudes toward abortion rights. The primary dependent measure in the analyses was a direct assessment of change in participants' attitudes from pre- to posttest (i.e., before versus after encountering the abortion rights essay). In order to compute this difference score, it was first necessary to standardize both pretest and posttest attitudes so that they were on the same metric. Standardized pretest attitudes toward abortion rights were then subtracted from their standardized posttest counterparts, thereby generating a difference score. Positive values indicated that posttest attitudes were more positive than pretest attitudes (i.e., a positive evaluative shift) and negative values indicated that posttest attitudes were more negative than pretest attitudes (i.e., a negative evaluative shift). A difference score of zero indicated no change in attitudes from pretest to posttest.

In order to examine both main and interactive effects of attitude extremity and political ideology (PID) on attitude difference scores, a hierarchical regression analysis was conducted. Also, given the nature of the target issue, gender was included as a third predictor variable.<sup>1</sup> The extremity of initial attitudes was operationalized in terms of evaluative distance from the midpoint of the original seven-point (-3 to +3) pretest attitudes scale. In order to assess the degree of extremity of starting attitudes toward abortion rights independent of valence, original pretest attitudes were squared. Thus, larger numbers were representative of more extreme initial attitudes. In accordance with Aiken and West (1991), both the attitude extremity and political ideology variables were centered to reduce collinearity, and the gender variable was dummy

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<sup>1</sup> Direct and interactive effects of IPQ on the attitudes difference scores were also examined. However, a hierarchical regression revealed no significant direct or interactive effects of IPQ,  $ps > .45$ .

coded (0 = “man,” 1 = “woman”). The dummy coded gender variable, along with the centered attitude extremity and political ideology variables, were entered in Step 1. The three two-way interactions among attitude extremity, political ideology, and gender (i.e., extremity X PID, extremity X gender, PID X gender) were entered in Step 2. The three-way interaction of attitude extremity, political ideology, and gender was entered in Step 3.

The first model of the regression analysis predicted significant unique variance in abortion rights attitude difference scores,  $F(3,58) = 4.24, p < .01, R^2 = .18$ . This significance was driven by a main effect of attitude extremity ( $B = -0.24, t(61) = -3.02, p < .001$ ), such that individuals with more moderate initial attitudes became more positive toward abortion rights whereas individuals with extreme initial attitudes tended not to change their attitudes. Model 2 did not contribute significantly to the prediction of difference scores in abortion rights attitudes,  $F(3,55) = 0.41, p = .75, R^2 = .02$ . However, the third model predicted significant additional variance in the difference scores,  $F(1,54) = 5.10, p < .03, R^2 = .07$ , due to the significant three-way interaction of attitude extremity, political ideology, and gender,  $B = 0.48, t(61) = 2.26, p < .03$  (see Figure 1). To decompose this pattern, regression models predicting the effects of gender at high (+1 SD) and low (-1 SD) levels of attitude extremity and political ideology were run (Aiken & West, 1991). Gender did not predict changes in abortion rights attitudes for more liberal individuals, regardless of whether their initial attitudes were relatively moderate ( $B = 0.98, t(61) = 1.78, p = .08$ ) or extreme ( $B = -0.09, t(61) = -0.32, p = .75$ ). In addition, no differences in the attitude change scores of men versus women were found among conservative individuals with more moderate views initially,  $B = -0.11, t(61) = -0.35, p = .73$ . Gender emerged as a significant predictor of attitude difference scores only for conservative individuals who also held relatively extreme attitudes toward abortion rights,  $B = 0.75, t(61) = 2.24, p < .03$ ,

such that among conservatives with extreme attitudes, men became more evaluatively negative whereas women tended not to change.

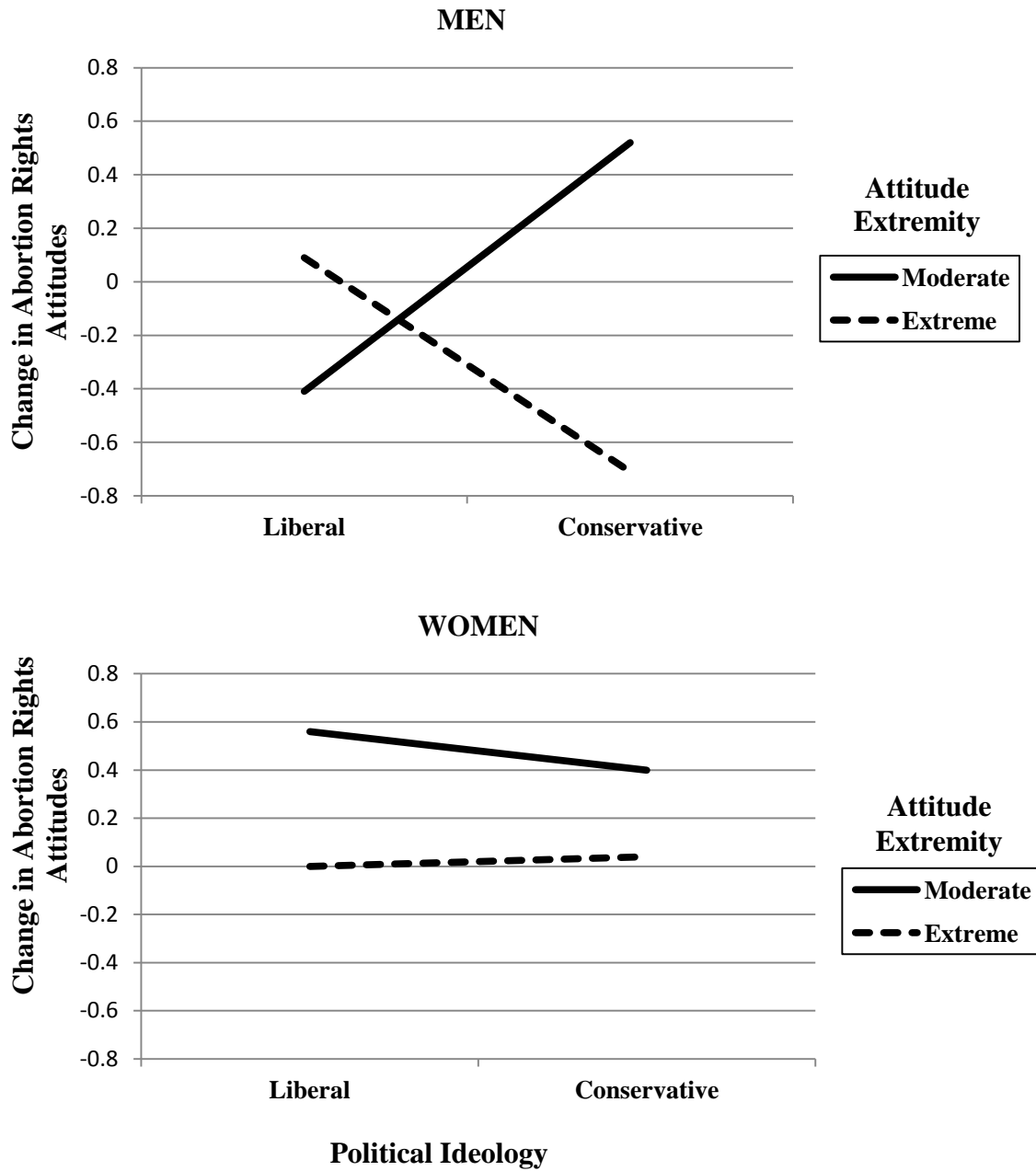


Figure 1. Abortion rights attitude difference scores as a function of gender, attitude extremity, and political ideology at one standard deviation above and below the mean (Study 1).

To further explore gender differences, the regression model predicting the effects of attitude extremity, political ideology, and their interaction was run for men and women separately. The results of these analyses indicated that the effects of extremity, ideology, and their interaction differed by gender. Specifically, extremity was the only significant predictor of abortion rights difference scores for women,  $B = -.22$ ,  $t(42) = -2.58$ ,  $p < .02$ , such that moderate initial attitudes were associated with positive change and extreme attitudes were associated with relatively little change. Among men, the only effect approaching significance was that of the attitude extremity X political ideology interaction,  $B = -.43$ ,  $t(13) = -1.97$ ,  $p = .07$ .

### **Conclusions**

Study 1 was the first attempt to examine the effects of attitudinal extremity and political ideology on change in attitudes toward an issue (i.e., abortion rights) following exposure to a mix of statements supporting and opposing that issue. The results provide an initial indication of the relations among attitude extremity, political ideology, and persuasion in response to mixed evidence. First, extremity of initial attitudes was found to significantly predict the degree and direction of attitude change. Specifically, individuals who reported more extreme evaluative positions at the outset of the study demonstrated resistance to altering that attitude after having read the arguments supporting and opposing abortion rights, whereas participants with more moderate initial attitudes became more positive in their attitudes toward abortion rights. This pattern of results supported the first hypothesis and was in keeping with much of the research surrounding the phenomenon of attitude polarization. These studies have found that individuals with more extreme attitudes toward a topic tend to report either an entrenchment or intensification of those initial evaluative stances following exposure to a mix of supporting and opposing statements (e.g., Lord et al., 1979; Miller et al., 1993; Boysen & Vogel, 2007, 2008).

In contrast, individuals expressing more moderate attitudes toward abortion rights demonstrated a positive shift in their evaluative positions following exposure to mixed evidence. This greater openness to change associated with moderate attitudes is also consistent with past work (e.g., Miller et al., 1993).

Study 1 also examined the effect of political ideology on attitude difference scores. It was hypothesized that political conservatives would demonstrate polarization of their initial attitudes, whereas political liberals were expected to depolarize. However, political ideology did not emerge as a significant predictor of change in abortion rights attitudes in this study. As previously noted, the sample was not skewed or restricted in regards to ideology, meaning that the lack of political ideology main effect was not due to a lack of ideological variability in the sample. The target issue itself may explain this lack of a predictive effect of political ideology on attitude change. The distribution of pretest abortion rights attitudes was highly negatively skewed, indicating that participants were generally highly positive about the issue of abortion rights. It seems that individuals in this college sample held relatively positive attitudes toward the target issue, regardless of their political ideology. Given the predominance of pro-choice sentiment at pretest, even relatively more conservative individuals evaluated the issue positively.

Finally, an interactive effect for attitude extremity and political ideology was also predicted. In Study 1, this interaction emerged, but not in the predicted direction and only for men. Specifically, attitude extremity did not predict change scores for liberal men, but for conservative men, extreme attitudes were associated with a negative shift in abortion rights attitudes, whereas moderate attitudes predicted a positive shift. The change in women's attitudes toward abortion rights was predicted only by the extremity of their initial attitudes: Consistent with the broader extremity main effect, women with extreme attitudes demonstrated resistance to

change, whereas women espousing more moderate evaluative views became more positive about abortion rights. Given the nature of the issue, it may be that women viewed abortion rights as a topic of greater personal relevance. As such, women's attitudinal reactions following the mixed message arguments about abortion rights were driven largely by how extreme versus moderate their initial attitudes were and were not dependent upon ideological identification. For men, the issue of abortion rights likely did not carry the same degree of personal relevance as it did for women. As such, male participants' attitudinal reactions depended not only upon the extremity of initial attitude but also ideological propensities.

In sum, Study 1 provided initial evidence that attitudinal extremity predicts the degree and direction of attitude change following exposure to mixed evidence. In addition, the nature of the topic itself may help to explain the divergent result patterns between men and women: evidence that the particular issue topic may also influence attitudinal reactions and propensities to polarize. Overall, political ideology was not associated with attitude polarization, which may be due to the nature of the specific topic - abortion rights - and the use of a college sample.

## Study 2

Study 2 replicated and expanded upon the first study in three primary ways. First, a new social issue, gun control, was employed in an effort to determine whether the patterns of attitude change related to abortion rights in Study 1 generalized to a different attitude target. Second, participants completed thought listings in order to more clearly examine the processing of the mixed evidence statements. Past work on attitude polarization has indicated that the relation between attitude extremity and polarization is driven by the biased assimilation of statements that support versus oppose that view (e.g., Lord et al., 1979; Miller et al., 1993). The inclusion of thought listings in Study 2 allowed me to assess if, in fact, there were differences in the processing and recall of the gun control essay based upon attitude extremity as found in previous studies and if any differences in biased assimilation mediated the extremity-polarization relation. Specifically, the accuracy of the information recalled in the thought listings indicated participants' processing and recall of the arguments presented, thereby providing a gauge of the degree to which the information was interpreted in a biased manner. Third, a need for cognition scale (NFC; Cacioppo & Petty, 1982) was added in order to assess an important individual difference: propensity to engage in thought (i.e., cognitive elaboration). Participants' general tendency to cognitively elaborate could potentially affect the relations among attitude extremity, political ideology, and attitude polarization, as well as the extent to which they processed the issue essay on gun control. As such, it was important to measure and control for individual differences in need for cognition.

**Hypothesis 1. Extremity of initial attitudes predicts attitude polarization.** In keeping with Study 1's predictions, a main effect for attitudinal extremity was hypothesized, such that individuals expressing more extreme attitudes toward gun control at the outset were

expected to adopt even more extreme evaluative positions (i.e., polarize) following the presentation of mixed evidence, whereas those with relatively more moderate initial attitudes were expected to demonstrate more “willingness” to change in response to the mixed evidence, therefore resulting in depolarization of their pretest attitudes (Miller et al., 1993).

**Hypothesis 2. Political ideology predicts attitude polarization.** As in Study 1, a main effect for political ideology was also hypothesized. Specifically, it was predicted that political conservatives would show more evidence of polarization than would political liberals. Ideology may not have emerged as a significant predictor in Study 1 due to the nature of the target issue, abortion rights. As a different issue, gun control, was employed in Study 2, the original hypothesis regarding a main effect for political ideology on attitude change was again advanced.

**Hypothesis 3. Attitude extremity and political ideology interactively affect attitude polarization.** It was again expected that the effect of extremity of initial attitudes on subsequent polarization would depend upon ideological allegiances to the right versus the left. Specifically, political conservatives were predicted to demonstrate attitude polarization in response to the mix of statements about gun control, regardless of whether their initial attitudes about gun control were relatively extreme or relatively moderate. Among liberals, however, it was anticipated that those holding extreme attitudes would be more apt to polarize, whereas individuals reporting moderate initial attitudes would show evidence of depolarization

**Hypothesis 4. Biased assimilation mediates the link between attitude extremity and attitude polarization.** Studies of the attitude polarization phenomenon have repeatedly indicated that the relation between attitude extremity and polarization is driven, at least in part, by the biased assimilation of mixed persuasive evidence (e.g., Lord et al., 1979; Miller et al., 1993). Specifically, research has shown that individuals holding extreme attitudes about a target



issue do not process subsequent information in a balanced manner. Rather, the vividness of that extreme initial attitude colors the processing of even a seemingly balanced mix of supporting and opposing statements, such that the extreme attitude holder comes away from the mixed evidence even more confident of the correctness of his or her original view and the faultiness of the opposing view. It is this biased assimilation of new information that strengthens the pre-existing attitude and, in so doing, gives rise to attitude polarization.

In keeping with the pattern found in previous empirical investigations, it was therefore hypothesized that biased processing would at least partially mediate the extremity-polarization relation. That is, individuals holding extreme attitudes were expected to engage in more biased assimilation and processing of the mixed evidence about gun control than those holding moderate initial attitudes, and this discrepancy in processing, in turn, was expected to manifest as greater attitude polarization among extreme attitude-holders versus moderates.

## **Method**

### **Participants**

Eighty-one individuals enrolled in psychology courses at Virginia Commonwealth University participated in the study for one hour of research credit. As with Study 1, there were no exclusion criteria in regards to gender, race, or religious affiliation. The only requirements for participation were a minimum age of eighteen and fluency in English, as participants needed to be able to carefully read and evaluate a written argument. In addition, individuals who had participated in Study 1 were not eligible to take part in Study 2. Two participants were excluded from analyses due to inappropriate completion (e.g., selecting the same response option for all items in a questionnaire containing reverse-coded items) of the study measures. The final

sample was therefore comprised of seventy-nine participants (forty women; 54% Caucasian, 16% Asian, 16% Black, 4% Hispanic, and 10% "other").

## **Measures and Materials**

**Pretest Attitudes Measure.** Participants' initial attitudes toward a variety of social issues were assessed using the same set of 7-point semantic differential scales ranging from -3 (negative) to +3 (positive) employed in Study 1 (see Appendix A). Embedded in this series of questions was an item assessing views on the issue of gun control, which served as the pretest attitude assessment.

**Social Networking Sites Essay.** The same series of statements describing the benefits and risks of using social networking sites developed and employed in Study 1 was again incorporated in Study 2 (Appendix B).

**Gun Control Essay.** A series of statements supporting and opposing gun control were developed (see Appendix G). Statements supporting gun control centered on the dangers of guns falling into the wrong hands, the link between gun legislation and lowered crime rates, and the importance of background checks and safety features. Oppositional statements focused on defending the right to bear arms and the importance of gun ownership for self-defense purposes. Arguments were adapted from the websites of organizations devoted to gun control (e.g., Brady Campaign to Prevent Gun Violence) as well as those opposed to gun control (e.g., National Rifle Association). Messages were standardized in terms of length and content, and the order of presentation of the supporting and opposing statements was counterbalanced.

**Posttest Attitudes Measure.** Participants' posttest attitudes toward gun control were assessed using the same series of items used in Study 1. Participants rated the issue of gun control on five semantic differential scales, ranging from -4 to +4, with the following endpoints:

(a) dislike/like, (b) bad/good, (c) negative/positive, (d) unfavorable/favorable, and (e) against/in favor. As in Study 1, a composite variable (with higher scores indicating greater positivity toward gun control) was created by averaging the five posttest attitude items ( $\alpha = .95$ ).

**Thought Listings.** Following the posttest attitude items, participants were provided with eight blank spaces and asked to list, in each, one thought or fact that they recalled from the essay they had read on gun control. The content of the thought listings provided information regarding the accuracy versus inaccuracy (i.e., bias) of individuals' recall of the presented information. This information provided evidence of the extent to which participants processed and recalled the mixed evidence statements in an accurate manner versus demonstrated inaccurate processing of the mixed information.

The thought listings were subsequently examined by two independent coders and rated in terms of the accuracy of the information provided. For each thought listing, each coder compared participants' written responses to the information provided in the original gun control essay to determine how closely they matched. Thought listings were rated on a scale of 1 (not at all accurate) to 5 (extremely accurate). Paired comparisons of the accuracy ratings revealed that there was sufficient agreement between the coders ( $r_s > .70$ ), so average accuracy ratings for each thought listing were generated from the coders' paired ratings. These individual accuracy ratings demonstrated good internal consistency ( $\alpha = .78$ ) and were therefore averaged to create a composite accuracy variable, for which higher scores represented greater accuracy. This composite accuracy variable served as the primary indicator of biased assimilation.

**Political Ideology Scale.** Political ideology was again assessed using the composite scale developed and employed in Study 1 (see Appendix D). After reverse-coding the self-reported ideology question and standardizing all items, the forty-five political ideology items

were averaged to create a composite variable representing political ideology ( $\alpha = .89$ ), for which higher scores were indicative of a more conservative ideological orientation.

**Importance of Politics Questionnaire.** To assess the potential motivational factor of importance placed on politics, participants completed the “importance of politics” questionnaire developed for Study 1 (see Appendix E). After standardization, all eighteen items were found to correlate positively with one another and demonstrated good internal consistency ( $\alpha = .86$ ). As such, they were averaged to form a composite variable assessing the importance of politics, with higher scores indicating greater importance.

**Need for Cognition Scale.** In addition to assessing participants’ attitudes, political ideology, and importance placed on politics, individuals’ need for cognition (NFC) was measured. As outlined by Petty and Cacioppo (1986) and demonstrated empirically by Cacioppo, Petty, Kao, and Rodriguez (1986), people who routinely engage in and enjoy effortful cognitive processing ( $NFC_{high}$ ) are more motivated to process deeply and thus operate at a higher level of elaboration than low need for cognition individuals ( $NFC_{low}$ ). In order to gauge this individual difference variable, all participants completed Cacioppo and Petty’s (1982) 18-item need for cognition scale (see Appendix H). This scale included items such as “I find satisfaction in deliberating hard and for long hours” and “I prefer my life to be filled with puzzles that I must solve.” Individuals indicated how characteristic of themselves each item was on a scale ranging from 1 (Very uncharacteristic) to 5 (Very characteristic). After reverse-scoring the necessary items, the average of these eighteen items was computed to create a composite NFC score ( $\alpha = .87$ ), with higher scores indicative of higher need for cognition.

**Demographics Questionnaire.** Finally, participants completed a demographics questionnaire (see Appendix F) assessing sex, marital status, ethnicity, religious affiliation, and hometown size.

### **Procedure**

The procedure for Study 2 closely resembled that of Study 1. Upon arrival at the lab, following informed consent, participants provided their attitudes about several issues, including the target issue, gun control. Next, they read the essays describing the pros and cons of social networking sites and evaluated the issue. Then, they read the mixed evidence essay about the target issue (gun control) and completed the posttest attitudes measure. In addition, participants then provided their thoughts about the topic via eight thought listings. Participants then completed the following measures: Need for Cognition (NFC), Importance of Politics (IPQ), demographics, and Political Ideology (composite scale and self-identification item; PID). Finally, participants were debriefed, any questions were addressed, and they were dismissed.

## **Results**

### **Descriptive Statistics**

Descriptive statistics for the primary variables of interest in Study 2 are presented in Table 2. Before proceeding with tests of the study's main hypotheses, it was necessary to ensure that the data met all assumptions of normality, linearity, and homogeneity of variance. Pretest attitudes toward gun control were found to be positively skewed ( $Skewness = 1.07$ ,  $SE = 0.27$ ). In order to correct for this, a log transformation was performed on the pretest gun control variable. Following transformation, the new variable demonstrated much improved fit statistics ( $Skewness = -0.05$ ,  $SE = 0.27$ ), so subsequent analyses were conducted using this transformed variable. All other variables of interest were found to meet the assumptions of normality,

linearity, and homogeneity of variance, making it appropriate to run analyses with these data in their original form. As in Study 1, the composite measure of political ideology was not significantly skewed (Skewness = -0.03,  $SE = 0.27$ ), indicating that the sample was not biased in terms of its ideological composition.

Table 2.

*Descriptive Statistics for Study 2*

Variable	<i>M (SD)</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>SE<sub>Sk</sub></i>
Pretest Gun Control Attitude	2.83 (1.67)	1.00	7.00	1.07	0.27
Posttest Gun Control Attitude	6.69 (1.82)	1.00	9.00	-0.59	0.27
Political Ideology Composite <sup>1</sup>	2.63 (0.48)	1.39	4.84	-0.03	0.27
Self-Identified Ideology <sup>1</sup>	4.75 (1.94)	1.00	9.00	0.07	0.27
Importance of Politics <sup>2</sup>	0.00 (0.71)	-2.16	1.58	-0.35	0.27
Need for Cognition	3.35 (0.61)	1.61	4.67	0.01	0.27
Accuracy	2.99 (0.69)	1.00	4.50	-0.57	0.27

<sup>1</sup> higher values = more conservative

<sup>2</sup> standardized composite

### **Tests of Main Hypotheses**

The main purpose of the current study was to test the effects of attitude extremity and political ideology on changes in attitudes toward gun control. As in Study 1, the primary dependent measure in the analyses was direct assessment of change in participants' attitudes from pre- to posttest (i.e., before versus after encountering the gun control essay). The difference score was computed in the same way as in the first study. Positive values indicated that posttest attitudes were more positive than pretest attitudes (i.e., a positive evaluative shift)

and negative values indicated that posttest attitudes were more negative than pretest attitudes (i.e., a negative evaluative shift). A difference score of zero indicated that no change in attitudes had occurred from pretest to posttest.

In order to examine both main and interactive effects of attitude extremity and political ideology (PID) on attitude difference scores, a hierarchical regression analysis was conducted. Need for cognition (NFC) was also included as a predictor, given past work demonstrating differential processing of arguments among high versus low elaborators.<sup>2</sup> Attitude extremity was operationalized in the same way as in Study 1 (i.e., pretest attitude squared). In accordance with Aiken and West (1991), the attitude extremity, political ideology, and need for cognition variables were centered to reduce collinearity. These three centered variables (extremity, PID, NFC) were entered in Step 1. The three two-way interactions among attitude extremity, political ideology, and need for cognition (i.e., extremity X PID, extremity X NFC, PID X NFC) were entered in Step 2. The three-way interaction of attitude extremity, political ideology, and need for cognition was entered in Step 3.

The first model of the regression analysis predicted significant unique variance in gun control attitude difference scores,  $F(3,75) = 8.23, p < .001, R^2 = .25$ . A main effect of attitude extremity was found ( $B = 0.60, t(78) = 4.19, p < .001$ ), such that individuals with more moderate attitudes became more negative toward gun control and individuals with more extreme attitudes became more positive toward gun control. In addition, need for cognition emerged as a significant predictor of gun control attitude difference scores ( $B = 0.39, t(78) = 2.80, p < .01$ ), such that higher NFC scores were associated with positive attitude change.

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<sup>2</sup> Direct and interactive effects of gender and IPQ on gun control attitude difference scores were also examined. However, hierarchical regressions revealed no significant direct or interactive effects of either gender or IPQ,  $ps > .17$ .

The second model also contributed significantly to the prediction of difference scores in gun control attitudes,  $F(3,72) = 3.14, p = .03, R^2 = .09$ . This was driven by a significant interaction between attitude extremity and political ideology,  $B = 0.41, t(78) = 2.33, p < .03$  (see Figure 2).

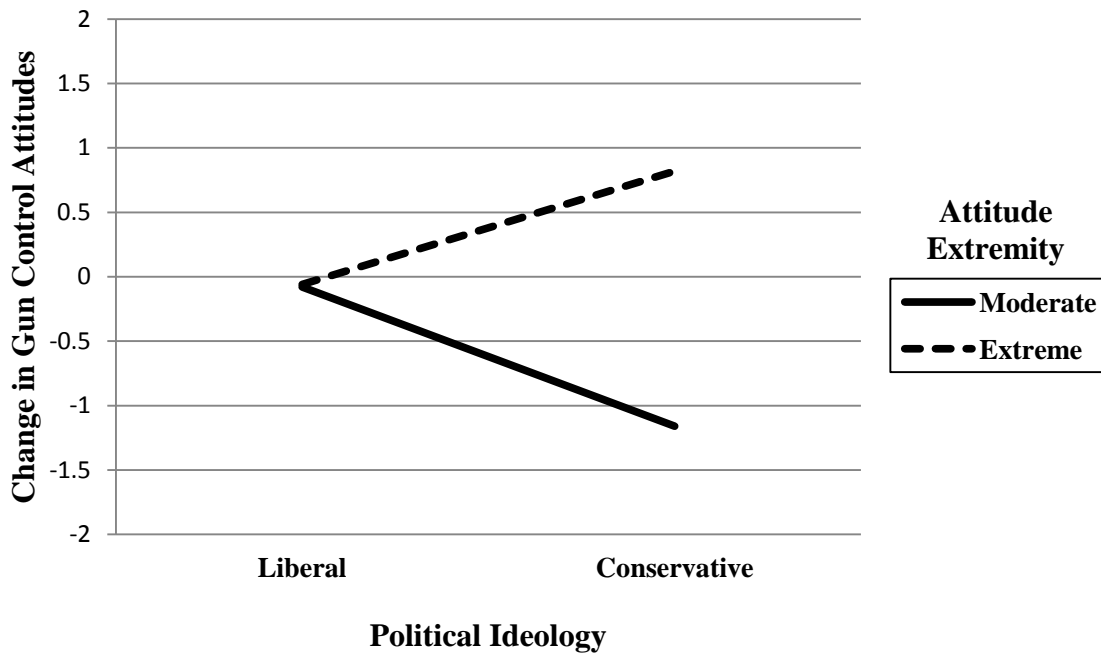


Figure 2. Gun control attitude difference scores as a function of attitude extremity and political ideology at one standard deviation above and below the mean (Study 2).

To more closely examine this pattern, simple slopes analyses were conducted as outlined by Aiken and West (1991). These analyses revealed that the coefficients associated with extremity differed depending upon the level of PID. Liberal individuals (-1 SD) tended not to change their attitudes about gun control, regardless of the extremity of their initial attitudes,  $B = 0.01, t(78) = 0.06, p = .95$ . For more conservative participants (+1 SD), a relation existed between attitude extremity and difference scores,  $B = 0.98, t(78) = 5.01, p < .001$ . Specifically, conservative individuals with more extreme initial attitudes demonstrated a positive shift in their



attitudes toward gun control, whereas conservatives with more moderate initial attitudes became more negative. Thus, although liberals tended not to change their attitudes regardless of how moderate versus extreme their initial evaluations were, conservatives espousing extreme initial attitudes became more positive about gun control and those expressing moderate attitudes became more negative.

The third model emerged as marginally significant in predicting variance in gun control attitude difference scores,  $F(1,71) = 3.74, p < .06, R^2 = .03$ , due to the trending three-way interaction of attitude extremity, political ideology, and need for cognition,  $B = -0.26, t(78) = -1.93, p < .06$  (see Figure 3). To decompose the interaction, regression models predicting the effects of need for cognition at high (+1 SD) and low (-1 SD) levels of attitude extremity and political ideology were run (Aiken & West, 1991). Need for cognition did not predict perceived attitude change for more conservative participants, regardless of whether they held relatively moderate ( $B = 0.45, t(78) = 1.34, p = .19$ ) or extreme ( $B = 0.14, t(78) = 0.53, p = .60$ ) initial attitudes toward gun control. In addition, need for cognition did not predict gun control attitude difference scores among liberals with moderate initial attitudes,  $B = -0.01, t(78) = -0.02, p = .98$ . Need for cognition emerged as a significant predictor of gun control attitude difference scores only for liberal participants who expressed relatively extreme attitudes toward the target issue,  $B = 0.72, t(78) = 3.08, p < .01$ . Among this particular subgroup, individuals higher in need for cognition became more evaluatively positive, whereas those lower in need for cognition tended not to change their attitudes toward gun control.

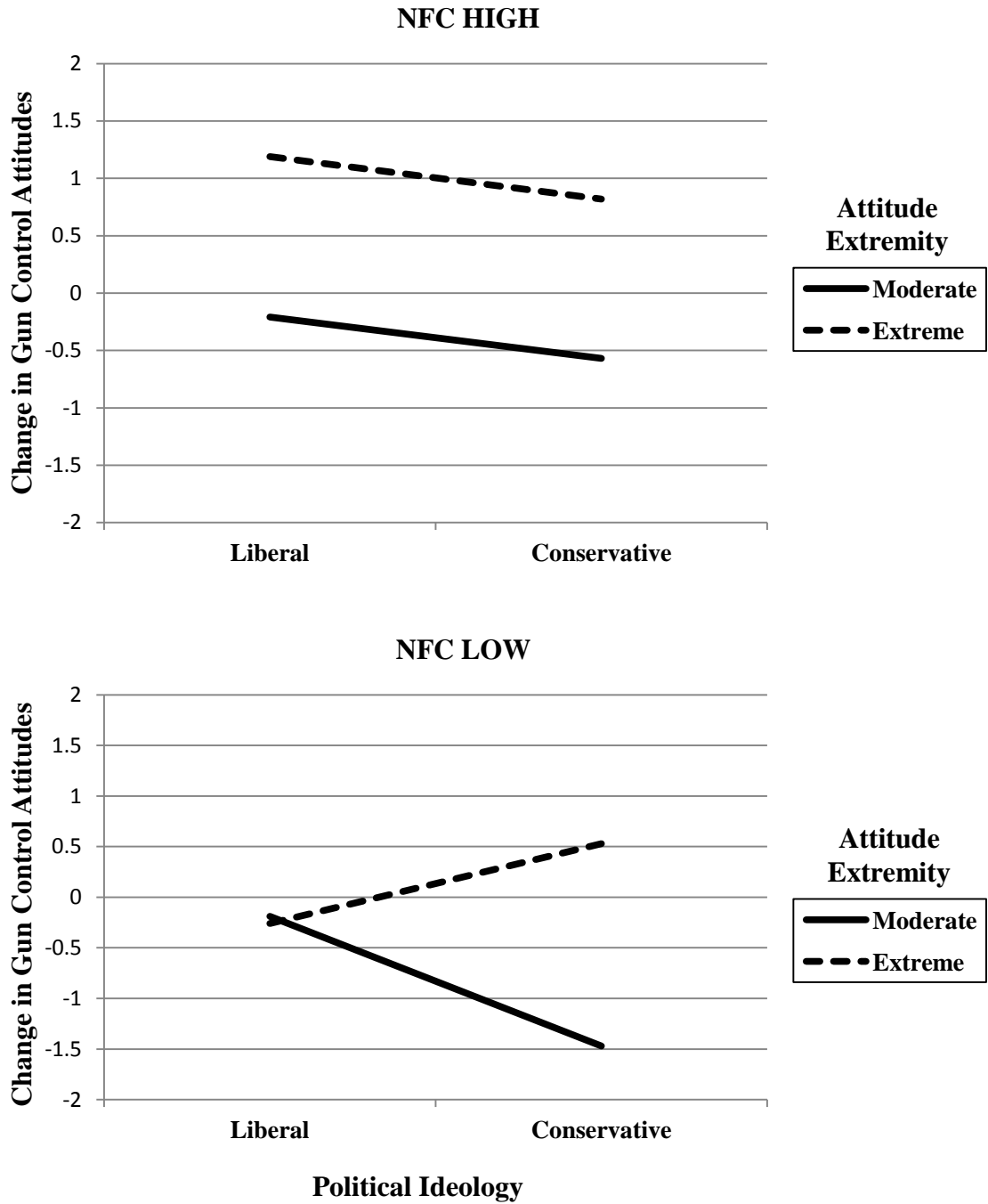


Figure 3. Gun control attitude difference scores as a function of need for cognition, attitude extremity, and political ideology at one standard deviation above and below the mean (Study 2).

### **Accuracy as a Mediator of the Extremity-Polarization Relation**

It was hypothesized that differences in biased assimilation would at least partially mediate the extremity-polarization relation in Study 2. In order to examine whether the significant relation between attitude extremity and gun control attitude difference scores was at least partially accounted for by differences in the accuracy of processing of extreme versus moderate attitude holders, this mediation model was tested in accordance with procedures detailed by Baron and Kenny (1986). First, the direct relation between attitude extremity and gun control attitude difference scores was assessed via a regression model predicting difference scores from extremity. This relation was found to be significant,  $B = 0.56$ ,  $t(78) = 3.94$ ,  $p < .001$ , with extreme attitudes associated with positive change and moderate attitudes associated with negative change. Next, the relation between attitude extremity and accuracy was examined by entering extremity as the sole predictor in a regression model predicting accuracy. This path was marginally significant ( $B = -0.21$ ,  $t(78) = -1.83$ ,  $p = .07$ ) and indicated that more extreme attitudes were associated with less accuracy in processing and recall (consistent with past work related to biased assimilation, e.g., Lord et al., 1979). Finally, the direct and indirect paths between attitude extremity and difference scores were assessed simultaneously by entering both extremity and accuracy into a regression model predicting gun control attitude difference scores. Accuracy did significantly predict difference scores,  $B = 0.33$ ,  $t(78) = 2.32$ ,  $p < .03$ . However, the inclusion of this indirect path did not affect the magnitude of the direct relation between attitude extremity and change in gun control attitudes, which remained significant ( $B = 0.60$ ,  $t(78) = 4.21$ ,  $p < .001$ ). A Sobel's test confirmed that there was no significant decrease in the relation between attitude extremity and gun control difference scores after controlling for accuracy, Sobel's  $z = -0.15$ ,  $p = .14$ .

Given that accuracy did significantly predict gun control attitude difference scores, it was included in a hierarchical regression model to determine if it moderated the effects of the primary predictors (i.e., attitude extremity, political ideology) on difference scores. The centered versions of extremity, ideology, and accuracy were entered in Step 1; the three two-way interactions (i.e., extremity X PID, extremity X accuracy, PID X accuracy) were entered in Step 2; and the three-way interaction (i.e., extremity X PID X accuracy) was entered in Step 3. The first model of the regression analysis was significant,  $F(3,75) = 6.69, p < .001, R^2 = .21$ . In addition to the main effect for attitude extremity previously examined, accuracy also emerged as a significant predictor of gun control difference scores ( $B = 0.33, t(78) = 2.31, p < .03$ ), indicating that greater accuracy was associated with positive attitude change.

Model 2 also predicted significant unique variance in attitude difference scores,  $F(3,72) = 5.14, p < .001, R^2 = .14$ . This significance was driven by two effects: the previously examined attitude extremity X political ideology interaction, and a significant interaction between attitude extremity and accuracy,  $B = 0.39, t(78) = 2.84, p < .01$  (see Figure 4). Simple slopes analyses revealed that accuracy did not predict attitude change for participants with relatively moderate (-1 SD) initial attitudes toward gun control,  $B = -0.16, t(78) = -0.72, p = .47$ . For participants with relatively extreme (+1 SD) gun control attitudes, however, accuracy significantly predicted difference scores,  $B = 0.63, t(78) = 3.65, p < .001$ . Specifically, individuals with more extreme attitudes who were also more accurate in their recall demonstrated a positive shift in their evaluations of gun control, whereas extreme attitude holders who were less accurate were less likely to change their attitudes. Consistent with this, the effect of attitude extremity was significant for more accurate (+1 SD) participants ( $B = 1.05, t(78) = 5.00, p < .001$ ) but not for less accurate (-1 SD) individuals ( $B = 0.26, t(78) = 1.46, p = .15$ ). The significant interaction

between attitude extremity and political ideology was therefore driven by the positive evaluative shift among more accurate individuals who also held relatively extreme initial attitudes toward gun control.

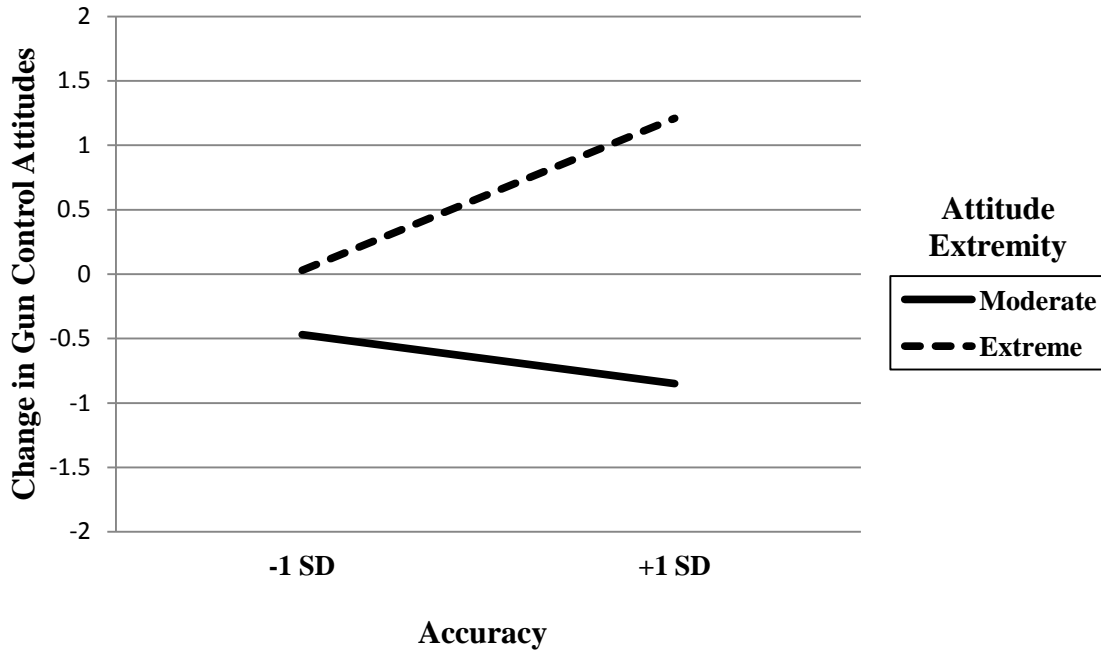


Figure 4. Gun control attitude difference scores as a function of attitude extremity and accuracy at one standard deviation above and below the mean (Study 2).

### Conclusions

Study 2 built upon the findings obtained in the first study and provided further information regarding the relations among attitude extremity, political ideology, and attitude change following exposure to mixed evidence about a target issue. First, although extremity of initial attitudes was again found to significantly predict the degree and direction of attitude change, the result pattern differed from that found in the first study. In Study 2, individuals who reported more extreme evaluative positions toward gun control became more positive after having read the arguments supporting and opposing gun control, whereas participants with more

moderate attitudes initially became more negative in their attitudes toward gun control. Instead of demonstrating resistance to change, those holding relatively more extreme attitudes about gun control demonstrated a positive shift in their evaluations of the target. This change in attitude may reflect that participants were not as familiar with or invested in the issue of gun control as Study 1 participants were in regards to abortion rights. Attitudes toward gun control may not have been very salient or the issue may not have been seen as personally relevant in this particular college sample.

Study 2 also examined the effect of political ideology on attitude difference scores. It was hypothesized that political conservatives would demonstrate polarization of their initial attitudes, whereas political liberals were expected to depolarize. However, consistent with Study 1, political ideology did not emerge as a significant predictor of change in gun control attitudes. Political ideology did interact with attitude extremity, but not in the predicted direction. Attitude extremity did not predict change scores for liberals, who demonstrated resistance to change regardless of the extremity of their initial views on gun control. For conservative individuals, however, attitude extremity significantly predicted gun control difference scores, such that extreme attitudes were associated with little change, whereas moderate attitudes predicted a negative shift. This finding was further qualified by a marginal three-way interaction with need for cognition. Although no effect of need for cognition on attitude difference scores was found for conservatives or participants with moderate attitudes, need for cognition significantly predicted changes in gun control attitudes among liberals with extreme attitudes. Specifically, liberal individuals who also expressed more extreme pretest attitudes demonstrated positive change if they were also relatively higher in need for cognition but resisted changing their views if they were relatively low in need for cognition.

The fourth hypothesis advanced in Study 2 was that biased assimilation would mediate the relation between attitude extremity and subsequent change in gun control attitudes. Past work in the attitude polarization literature has found evidence that individuals with more extreme attitudes engage in more biased (i.e., less accurate) processing of mixed information, thereby coming away even more assured of the correctness of their evaluative stance and potentially adopting a more extreme version of that position (e.g., Lord et al., 1979; Miller et al., 1993). In Study 2, the direct path from attitude extremity to gun control attitude difference scores was found to be significant, with more extreme attitudes associated with positive change. The relation between extremity and the hypothesized mediator, accuracy (a proxy for biased assimilation), was marginally significant and in the predicted direction. That is, more extreme attitudes toward gun control were predictive of less accurate (i.e., more biased) thought listings. Finally, both attitude extremity and accuracy significantly predicted difference scores when examined together, providing evidence that both the direct and indirect paths between extremity and attitude change were significant. However, accuracy did not mediate the extremity-attitude change relationship, given that there was not a significant reduction in the significance of the direct relation between attitude extremity and gun control difference scores when controlling for accuracy.

Although accuracy of participants' thought listings was not found to be a mediator between extremity of initial attitudes toward gun control and subsequent attitude change, its significant relation to both extremity and difference scores prompted its examination as a potential moderator. In addition to directly predicting gun control attitude difference scores (more accurate thought listings were associated with positive change; less accurate responses related to change resistance), the interactive effect of extremity and accuracy emerged as

significant. Specifically, although those with moderate initial attitudes tended not to change their attitudes regardless of their accuracy, individuals with extreme attitudes showed different change patterns depending upon how accurate they were. Whereas extreme attitudes coupled with high accuracy gave rise to positive difference scores, the pairing of extreme attitudes and less accurate thought listings was associated with resistance to change. This pattern is consistent with past work in the attitude polarization literature, which has found that extreme initial views accompanied by biased information processing relates to change resistance and polarization (e.g., Lord et al., 1979). Although accuracy did not mediate the extremity-attitude change relation, it did emerge as a significant moderator with effects patterns consistent with past work.

Study 2 provided further evidence that attitudinal extremity predicts the degree and direction of attitude change following exposure to mixed evidence. In addition, interactive effects with ideology, need for cognition, and accuracy suggest that many factors influence individuals' propensities to polarize.



### Study 3

The third study extended the findings of Studies 1 and 2 in three primary ways. First, the target issue was changed to tax increases in an effort to determine whether reactions to a fiscal topic differed from those elicited by the more socially flavored issues of abortion rights (Study 1) and gun control (Study 2). Second, two measures of individual propensities toward mental rigidity, cognitive flexibility (Martin & Rubin, 1995) and need for cognitive closure (Webster & Kruglanski, 1994), were added to Study 3. Study 2 focused on the role of biased assimilation as a potential mediator of the attitude extremity-attitude polarization relationship, as suggested by work in the attitude polarization tradition (e.g., Lord et al., 1979; Miller et al., 1993). Study 3 built upon this by investigating the role of mental rigidity, a general factor of interest in the ideological difference literature, in contributing to change resistance and attitude polarization. Past research suggests that political conservatives are more cognitively rigid, more dogmatic, and less integratively complex than their liberal counterparts (e.g., Gruenfeld, 1995; Smithers & Loble, 1978; Altemeyer, 1981; Tetlock, 1983, 1984). In addition, the psychological need for cognitive closure, a central element of Lay Epistemic Theory, tends to be greater among political conservatives versus liberals (Jost et al., 1999). The inclusion of these measures in Study 3 allowed for the assessment of important motivational factors in terms of which liberals and conservatives have been shown to differ, as well as the relation between such differential motivation and subsequent attitude polarization. Third, self-reported attitude change was included as an additional measure of attitude polarization. Work in the attitude polarization tradition has assessed attitude change both directly, via difference scores (e.g., Tesser & Cowan, 1975; Harton & Latané, 1997), and indirectly, via self-reported attitude change (e.g., Lord et al., 1979; Miller et al., 1993). Incorporating self-assessed attitude change in addition to the use of

difference scores allowed for the comparison of the result patterns obtained for these measures of polarization.

**Hypothesis 1. Extremity of initial attitudes predicts attitude polarization.** In keeping with the results of Studies 1 and 2, a main effect for attitudinal extremity was again hypothesized, such that individuals expressing more extreme attitudes toward tax increases at the outset were expected to adopt even more extreme evaluative positions (i.e., polarize) following the presentation of mixed evidence, whereas those with relatively more moderate initial attitudes were expected to demonstrate more “willingness” to change in response to the mixed evidence, therefore resulting in depolarization of their pretest attitudes (Miller et al., 1993).

**Hypothesis 2. Political ideology predicts attitude polarization.** As in the first two studies, a main effect for political ideology was again hypothesized. Specifically, it was predicted that political conservatives would show more evidence of polarization than would political liberals. Ideology may not have emerged as a significant predictor in Studies 1 or 2 due to the social nature of the target issues, abortion rights and gun control. As a different type of issue, tax increases, was employed in Study 3, the original hypothesis regarding a main effect for political ideology on attitude change was again advanced.

**Hypothesis 3. Attitude extremity and political ideology interactively affect attitude polarization.** It was again expected that the effect of extremity of initial attitudes on subsequent polarization would depend upon ideological allegiances to the right versus the left. Specifically, political conservatives were predicted to demonstrate attitude polarization in response to the mix of statements about tax increases, regardless of whether their initial attitudes about tax increases were relatively extreme or relatively moderate. Among liberals, however, it was anticipated that

those holding extreme attitudes would be more apt to polarize, whereas individuals reporting moderate initial attitudes would show evidence of depolarization

**Hypothesis 4. Biased assimilation mediates the link between attitude extremity and attitude polarization.** In keeping with Study 2 predictions, as well as research in the attitude polarization tradition, it was again hypothesized that accuracy of processing and recall would mediate the significant relation between extremity of initial attitudes and subsequent attitude change. That is, individuals holding extreme attitudes were expected to engage in more biased assimilation and processing of the mixed evidence about tax increases than those holding moderate initial attitudes, and this discrepancy in processing, in turn, was expected to manifest as greater attitude polarization among extreme attitude-holders versus moderates.

**Hypothesis 5. Mental rigidity mediates the relation between political ideology and attitude polarization.** Research on ideological differences has consistently indicated that liberals and conservatives differ in terms of mental rigidity. Past research has shown that liberals and conservatives differ in their need for cognitive closure (NCC) as well as their cognitive flexibility, such that political conservatives demonstrate higher NCC scores and lower flexibility scores than do political liberals (Rokeach, 1960; Tetlock, 1984; Webster & Kruglanski, 1994; Jost et al., 1999; Jost et al., 2003a).

The potential mediating effects of mental rigidity, as indicated by NCC and cognitive flexibility, on the ideology-polarization link was examined in Study 3. It was hypothesized that differences in mental rigidity, in terms of need for cognitive closure and cognitive flexibility, would at least partially mediate the political ideology-polarization relation. That is, political conservatives were expected to report higher levels of NCC and lower levels of cognitive

flexibility than political liberals, and this discrepancy in mental rigidity, in turn, was predicted to manifest as greater attitude polarization among conservatives than among liberals.

## **Method**

### **Participants**

One hundred thirty-one individuals enrolled in psychology courses at Virginia Commonwealth University (ninety-one women; 50% Caucasian, 28% Black, 11% Asian, 8% Hispanic, and 3% “other”) participated in the study for one hour of research credit. As in the previous two studies, there were no exclusion criteria in regards to gender, race, or religious affiliation. The only requirements for participation were a minimum age of eighteen and fluency in English, as participants needed to be able to carefully read and evaluate a written argument. In addition, individuals who had participated in Study 1 or Study 2 were not eligible to take part in Study 3.

### **Measures and Materials**

**Pretest Attitudes Measure.** Participants’ initial attitudes toward a variety of social issues were assessed using the same set of issue items employed in the first two studies (see Appendix A). However, the response options were expanded from 7-point to 9-point semantic differential scales (i.e., ranging from -4 (negative) to +4 (positive)) in order to facilitate the computation of attitude difference scores. Embedded in this series of questions was an item assessing views on the issue of tax increases, which served as the pretest attitude assessment.

**Social Networking Sites Essay.** The same series of statements describing the benefits and risks of using social networking sites developed and employed in the first two studies was again incorporated in Study 3 (Appendix B).

**Tax Increase Essay.** A series of statements supporting and opposing tax increases was developed (see Appendix I). Statements supporting tax increases, gathered and adapted primarily from the Democratic Party website, centered on the benefits of increased revenue for education, defense, and other social programs. Oppositional statements, which were largely adapted from the Republican Party website, focused on the burden that additional taxes would place on individuals and potential detrimental effects of slowed consumer spending and small business growth on the weakened national economy. Messages were standardized in terms of length and content, and the order of presentation of the supporting and opposing statements was counterbalanced.

**Posttest Attitudes Measure.** Participants' posttest attitudes toward tax increases were assessed using the same series of five items used in Studies 1 and 2. As in the previous studies, a composite variable (with higher scores indicating greater positivity toward tax increases) was created by averaging the five posttest attitude items ( $\alpha = .97$ ).

**Self-Reported Attitude Change.** In Study 3, participants also reported their self-assessed attitude change via the following item (e.g., Lord et al., 1979; Miller et al., 1993): "How would you compare your current attitude about raising taxes with the attitude you had at the very start of this experiment?" Response options ranged from -4 (much more against tax increases) to +4 (much more in favor of tax increases). Past work has relied upon self-reported change as the primary means of assessing attitude polarization (e.g., Lord et al., 1979). As such, the self-reported change item was incorporated in Study 3 and served as an additional dependent variable. Positive scores indicated self-perceived positive change in tax increase attitudes from pre- to posttest, negative scores indicated self-perceived negative change, and a score of zero indicated no self-perceived change in attitudes.

**Thought Listings.** Following the posttest attitude items, participants were again provided with eight blank spaces and asked to list, in each, one thought or fact that they recalled from the essay they had read on tax increases. The accuracy of these thought listings was subsequently rated by two independent coders on a scale of 1 (not at all accurate) to 5 (extremely accurate), as in Study 2. Paired comparisons of the accuracy ratings revealed that there was sufficient agreement between the coders ( $r_s > .70$ ), so average accuracy ratings for each thought listing were generated from the coders' paired ratings. These individual accuracy ratings demonstrated good internal consistency ( $\alpha = .81$ ) and were therefore averaged to create a composite accuracy variable, for which higher scores represented greater accuracy. This composite accuracy variable again served as the primary indicator of biased assimilation, as in Study 2.

**Political Ideology Scale.** Political ideology was again assessed using the composite scale developed and employed in the previous two studies (see Appendix D). After reverse-coding the self-reported ideology question and standardizing all items, the forty-five political ideology items were averaged to create a composite political ideology variable ( $\alpha = .85$ ), for which higher scores were indicative of a more conservative ideological orientation.

**Importance of Politics Questionnaire.** Importance placed on politics was assessed using the same questionnaire used in Studies 1 and 2 (see Appendix E). After standardization, all eighteen items were averaged to form a composite importance of politics variable ( $\alpha = .87$ ), with higher scores indicating greater importance.

**Need for Cognition Scale.** As in Study 2, all participants completed Cacioppo and Petty's (1982) 18-item need for cognition scale (see Appendix H). After reverse-scoring the

necessary items, the average of these eighteen items was computed to create a composite NFC score ( $\alpha = .86$ ), with higher scores indicative of higher need for cognition.

**Need for Cognitive Closure Scale.** The Need for Cognitive Closure Scale (NCCS) assesses individuals' preference for arriving at an answer - any answer - rather than remain undecided (Webster & Kruglanski, 1994). The original 42-item NCCS scale (Webster & Kruglanski, 1994) demonstrated good internal consistency ( $\alpha = .84$ ) and includes five facets or subscales: order (e.g., "I enjoy having a clear and structured mode of life"), predictability (e.g., "I dislike unpredictable situations"), decisiveness (e.g., "When I have made a decision, I feel relieved"), discomfort with ambiguity (e.g., "I dislike it when a person's statement could mean many different things"), and close-mindedness (e.g., "I do not usually consult many different opinions before forming my own view"). All items are rated on six-point Likert scales ranging from 1 (completely disagree) to 6 (completely agree), with higher scores representing greater need for closure.

In order to gauge individual differences in need for cognitive closure, all participants in Study 3 completed the abbreviated NCCS (see Appendix J). This 15-item abbreviated version of the NCCS (Roets & Van Hiel, 2011) is comprised of three items from each of the five subscales and has also demonstrated strong reliability ( $\alpha = .87$ ). In Study 3, these fifteen items were found to be highly correlated and internally consistent ( $\alpha = .86$ ), so their average was computed to create a composite NCCS variable, higher scores on which indicated greater need for cognitive closure.

**Cognitive Flexibility Scale.** The 12-item Cognitive Flexibility Scale (CFS; Martin & Rubin, 1995) was included in the third study in order to assess individual differences in willingness to consider multiple options and alternatives, as well as self-efficacy in being flexible

(Appendix K). Work investigating ideological differences has shown that conservatives are less cognitively flexible and cognitively integrated than are political liberals (e.g., Tetlock, 1984; Jost et al., 2003a). Response options range from 1 (strongly disagree) to 6 (strongly agree), with higher values indicating greater cognitive flexibility. In Study 3, the twelve CFS items were averaged to create a composite variable, which was found to have satisfactory internal consistency ( $\alpha = .77$ ). Higher scores on the composite CFS variable indicated greater cognitive flexibility.

**Demographics Questionnaire.** Finally, participants completed the demographics questionnaire (see Appendix F) assessing sex, marital status, ethnicity, religious affiliation, and hometown size.

## **Procedure**

The procedure for Study 3 was nearly identical to that of Studies 1 and 2. After having signed the informed consent forms, participants provided their attitudes about tax increases, among several other issues, followed by the CFS. Participants then read the essay about social networking sites and evaluated the issue. Next, they read about and evaluated tax increases, completed the self-reported attitude change item, and completed thought listings about the target issue. Participants then completed the following measures: Need for Cognition (NFC), Importance of Politics Questionnaire (IPQ), Need for Cognitive Closure Scale (NCCS), demographics, and Political Ideology (composite scale and self-identification item; PID). Finally, participants were debriefed, any questions were addressed, and they were dismissed.

## **Results**

### **Descriptive Statistics**



Descriptive statistics for the primary variables of interest in Study 3 are presented in Table 3. Before proceeding with tests of the study's main hypotheses, the data were checked for normality, linearity, and homogeneity of variance. The accuracy variable was found to be negatively skewed (Skewness = -1.11,  $SE = 0.21$ ). In order to correct for this, a log transformation was performed on the composite accuracy variable. Following transformation, the new variable demonstrated much improved fit statistics (Skewness = -0.55,  $SE = 0.21$ ), so subsequent analyses were conducted using this transformed accuracy variable.

Table 3.

*Descriptive Statistics for Study 3*

Variable	<i>M (SD)</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>SE<sub>Sk</sub></i>
Pretest Tax Increase Attitude	4.21 (2.07)	1.00	9.00	0.15	0.21
Posttest Tax Increase Attitude	4.62 (2.08)	1.00	9.00	-0.08	0.21
Self-Reported Attitude Change	-0.80 (1.38)	-4.00	4.00	-0.49	0.21
Political Ideology Composite <sup>1</sup>	2.48 (0.44)	1.42	4.60	-0.07	0.21
Self-Identified Ideology <sup>1</sup>	4.47 (1.79)	1.00	8.00	0.17	0.21
Importance of Politics <sup>2</sup>	0.00 (0.75)	-2.11	1.53	-0.53	0.21
Need for Cognition	3.48 (0.60)	2.00	4.83	-0.16	0.21
Accuracy	3.44 (0.49)	1.75	4.10	-1.11	0.21
Cognitive Flexibility	4.80 (0.55)	3.33	5.92	-0.24	0.21
Need for Cognitive Closure	3.80 (0.73)	1.67	5.80	-0.17	0.21

<sup>1</sup> higher values = more conservative

<sup>2</sup> standardized composite

All other variables of interest were found to meet the assumptions of normality, linearity, and homogeneity of variance, making it appropriate to run analyses with these data in their original form. As in the previous two studies, the composite measure of political ideology was not significantly skewed (Skewness = -0.07,  $SE = 0.21$ ) or restricted in range or variability, indicating that the sample was not biased in terms of its ideological composition.

### **Tests of Main Hypotheses**

The main purpose of the current study was to test the effects of attitude extremity and political ideology on changes in attitudes toward tax increases. In Study 3, two conceptualizations of attitude change were employed as dependent variables. First, as in Studies 1 and 2, a direct assessment of change in participants' attitudes from pre- to posttest (i.e., before versus after encountering the tax increase essay) was employed. The difference score was computed in the same way as in the previous studies, with positive values indicating a positive evaluative shift and negative values indicating a negative evaluative shift. In addition, the item assessing self-reported change in attitudes toward tax increases was employed as a second dependent variable. The correlation between these two measures was relatively weak ( $r = .29$ ,  $p < .05$ ), so they were analyzed separately.<sup>3</sup>

**Effects on difference scores.** In order to examine both main and interactive effects of attitude extremity and political ideology (PID) on attitude difference scores, a hierarchical

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<sup>3</sup> In addition to exploring the effects of attitude extremity and political ideology on both directly assessed and self-reported attitude change, the effects of several individual difference factors (i.e., gender, IPQ, NFC, accuracy, and mental rigidity) were also examined. Hierarchical regressions revealed no significant direct or interactive effects of IPQ, NFC, accuracy, or mental rigidity ( $ps > .09$ ) for either dependent measure. A main effect for gender on self-reported attitude change was found ( $B = -0.65$ ,  $t(130) = -2.51$ ,  $p < .02$ ), such that women reported becoming more negative than men. However, gender did not correlate with either attitude extremity or political ideology, and no interactive effects of gender were found to be significant,  $ps > .11$ . As this gender effect did not emerge for both conceptualizations of tax increase attitude change, it was not considered in the main analyses.

regression analysis was conducted. Attitude extremity was operationalized as in Studies 1 and 2 (i.e., pretest attitude squared). In accordance with Aiken and West (1991), the attitude extremity and political ideology variables were centered to reduce collinearity. The centered extremity and ideology variables were entered in Step 1, and their two-way interaction (i.e., extremity X PID) was entered in Step 2.

The first model of the regression analysis predicted significant unique variance in tax increase attitude difference scores,  $F(2,128) = 3.88, p < .03, R^2 = .06$ . This significance was driven by a main effect of attitude extremity,  $B = 0.43, t(130) = 2.64, p < .01$ . Specifically, it was found that individuals espousing more moderate attitudes toward tax increases tended not to change their attitudes, whereas those expressing extreme attitudes demonstrated positive attitude change. Neither political ideology nor the interaction of extremity and ideology emerged as significant predictors, and Model 2 did not predict significant unique variance in tax increase attitude difference scores,  $F(1,127) = 2.00, p = .16, R^2 = .02$ .

**Effects on self-reported attitude change.** A hierarchical regression was also conducted to investigate the effects of attitude extremity, political ideology, and their interaction on participants' self-reported change in attitudes toward tax increases. The centered extremity and ideology variables were entered in the first step, and their interaction comprised the second step. The first model of the regression analysis was marginally significant in predicting self-reported change in tax increase attitudes,  $F(2,128) = 2.68, p = .07, R^2 = .04$ . There was a significant main effect of attitude extremity,  $B = -0.24, t(130) = -2.04, p < .05$ . As in the model predicting actual difference scores, moderate attitudes were associated with no perceived change in tax increase attitudes. However, extreme attitudes were associated with self-reported negative attitude change.

The second model also contributed significantly to the prediction of self-reported change in tax increase attitudes,  $F(1,127) = 4.41, p < .04, R^2 = .03$ , due to the significant interaction between attitude extremity and political ideology,  $B = -0.25, t(130) = -2.10, p < .04$  (see Figure 5). Simple slopes analyses were conducted in accordance with Aiken and West (1991). For more conservative (+1 SD) individuals, a relation existed between extremity and difference scores such that extreme initial attitudes were associated with self-reported negative shifts in attitudes toward tax increases, whereas moderate attitudes were associated with relatively little perceived change,  $B = -0.47, t(130) = -2.94, p < .01$ . For more liberal (-1 SD) participants, extremity of initial attitude did not significantly predict self-reported tax increase attitude change,  $B = 0.03, t(130) = 0.15, p = .88$ . Furthermore, among participants with extreme attitudes (+1 SD), political ideology significantly predicted self-reported attitude change ( $B = -0.34, t(130) = -2.22, p < .03$ ), such that more conservative individuals reported becoming more negative than more liberal individuals.

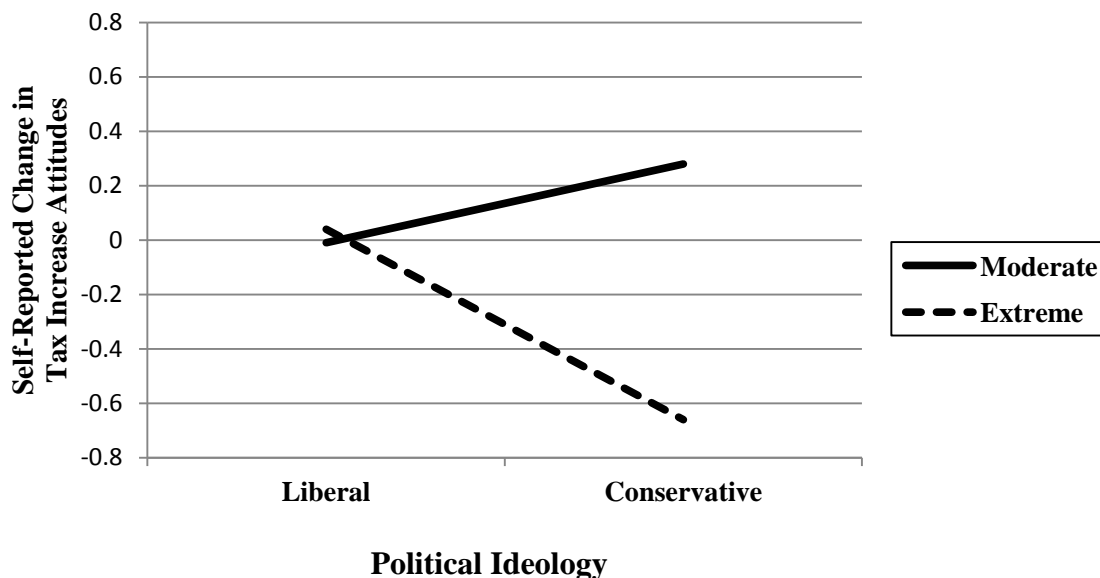


Figure 5. Self-reported change in tax increase attitudes as a function of attitude extremity and political ideology at one standard deviation above and below the mean (Study 3).

Political ideology did not significantly predict self-reported attitude change for participants with moderate initial attitudes (-1 SD),  $B = 0.15$ ,  $t(130) = 0.83$ ,  $p = .41$ . Together, these analyses indicate that more conservative individuals with more extreme attitudes perceived their attitudes toward tax increases to have become more negative following exposure to the mixture of supporting and opposing arguments, whereas liberals and those with more moderate initial attitudes tended to report less evaluative change.

### **Accuracy as a Mediator of the Extremity-Polarization Relation**

It was hypothesized that differences in biased assimilation, as assessed by accuracy of recall in the thought listings, would at least partially mediate the extremity-polarization relation in Study 3. Although attitude extremity significantly predicted both actual attitude change (i.e., posttest – pretest difference score),  $B = 0.43$ ,  $t(130) = 2.64$ ,  $p < .01$ , and perceived attitude change,  $B = -0.24$ ,  $t(130) = -2.03$ ,  $p < .05$ , attitude extremity did not predict accuracy,  $B = -0.09$ ,  $t(130) = -0.97$ ,  $p = .34$ . Moreover, accuracy did not predict attitude change as assessed by the difference score or self-reported change,  $ps > .40$ . Thus, there was no evidence of biased assimilation as a mediator of the extremity-polarization association.

### **Mental Rigidity as a Mediator of the Ideology-Polarization Relation**

As both cognitive flexibility and need for cognitive closure speak to the general characteristic of mental rigidity, the two measures (i.e., NCCS and CFS) were combined to create a composite variable indicating general mental rigidity. First, items from the CFS were reverse-coded, so that higher values indicated less cognitive flexibility. Then, all items in the NCCS and (newly reversed) CFS were standardized in order to put them on the same metric. All twenty-seven standardized items (15 NCCS; 12 CFS) were found to correlate highly and

demonstrated strong internal consistency ( $\alpha = .81$ ), so a composite variable assessing general mental rigidity was created, with higher values being indicative of greater mental rigidity.

It was hypothesized that differences in mental rigidity would at least partially mediate the relation between political ideology and tax increase attitude change in Study 3. Although political ideology did not emerge as a significant predictor of either difference scores ( $B = -0.15$ ,  $t(130) = -0.89$ ,  $p = .38$ ) or self-reported change ( $B = -0.13$ ,  $t(130) = -1.09$ ,  $p = .28$ ), most contemporary analysts (e.g., Kenny, 2011) argue that a significant direct relation need not be present in order for mediation to occur. As such, it was appropriate to proceed with tests of mediation despite the lack of a significant predictive effect of political ideology on the dependent measures of interest. Analyses revealed that political ideology did predict mental rigidity,  $B = 0.22$ ,  $t(130) = 2.54$ ,  $p < .02$ . In keeping with previous work on the relation between cognitive rigidity and political ideology (e.g., Webster & Kruglanski, 1994; Jost et al., 1999; Jost et al., 2003a), higher scores on the composite mental rigidity variable were associated with greater conservatism. However, mental rigidity did not predict attitude change as assessed by either the difference score or self-reported change,  $ps > .19$ .<sup>4</sup> Thus, there was no evidence that mental rigidity mediated the relation between political ideology and either actual or perceived attitude change.

### Conclusions

Study 3 built upon the findings obtained in the first two studies and provided further information regarding the relations among attitude extremity, political ideology, and attitude change following exposure to mixed evidence about a target issue. By including a measure of

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<sup>4</sup> Mediation analyses were also conducted employing NCCS and CFS as potential mediators of the ideology-attitude change relationship. As these analyses revealed the same pattern of results as those conducted on the overall composite mental rigidity variable, only mediation analyses involving mental rigidity are described.

self-reported attitude change, it was possible to examine and compare the effects of the primary predictors (i.e., extremity and ideology) on both actual and perceived changes in attitudes toward the target issue, tax increases. Consistent with the first two studies, a main effect for attitude extremity was again found, although the result pattern differed for directly assessed versus self-reported attitude change. Individuals expressing more moderate attitudes toward tax increases tended to remain consistent in their attitudes based on both the actual and self-reported attitude change. Individuals holding more extreme initial attitudes demonstrated and perceived attitude change. Interestingly, however, the direction of attitude change among extreme attitude holders differed for actual versus self-reported change: Whereas those expressing extreme attitudes actually became more positive in their evaluations of tax increases from pre- to posttest, these same individuals reported becoming more evaluatively negative. This divergent pattern across conceptualizations of attitude change is consistent with past work by Miller and colleagues (1993), which demonstrated that participants' directly assessed attitude change can differ markedly from their perceptions of their evaluative movement in terms of both valence and magnitude.

Study 3 also examined the effect of political ideology on both attitude difference scores and perceived attitude change. It was hypothesized that political conservatives would demonstrate polarization of their initial attitudes, whereas political liberals were expected to depolarize. However, as in the previous two studies, political ideology did not emerge as a significant predictor of either directly assessed or self-reported change in tax increase attitudes. Given the prominence of the target issue – tax increases – in the media and contemporary public discourse, it may be that individuals relied primarily upon their pre-existing (and likely salient) attitudes about tax increases in determining their evaluative reactions to the mixed evidence and

were relatively less inclined to use their ideological orientation as a guide in reporting their attitudes toward tax increases. As in the previous studies, the sample was not skewed or restricted in regards to ideology, making it highly unlikely that the lack of political ideology main effect could be accounted for by a lack of ideological variability in the sample.

In addition to the hypothesized main effects, an interactive effect for attitude extremity and political ideology was also predicted. In Study 3, this interaction did not significantly predict directly assessed changes in attitudes toward tax increases. However, the interactive effect of extremity and ideology emerged as a significant predictor of self-reported attitude change. Specifically, liberal participants tended to report not changing their attitudes, regardless of how moderate versus extreme their initial evaluations of tax increases were. In contrast, attitude extremity significantly predicted perceived change scores among conservative individuals, such that conservatives with moderate tax increase attitudes reported that their attitudes had not changed, whereas those espousing extreme attitudes reported becoming more negative in their views of tax increases. This pattern suggests that the only subgroup of participants in Study 3 who reported changing their attitudes toward the target issue were conservative individuals who espoused extreme attitudes about the issue at the outset of the study. Given the prominence of the issue of tax increases in mainstream political discourse, as well as the general stance among political conservatives that tax increases would further jeopardize an already faltering national economy, it is likely that the extreme attitudes expressed by some conservative participants were evaluatively negative. Indeed, a significant negative correlation between pretest attitudes and political ideology confirmed that conservatives' initial attitudes toward tax increases were significantly more negative than were liberals',  $r = -.26$ ,  $p < .01$ . The perception of becoming even more evaluatively negative toward tax increases



following exposure to mixed evidence about the issue would seem to indicate that attitude polarization occurred among conservatives with extreme initial attitudes.

The fourth and fifth hypotheses advanced in Study 3 proposed two factors as mediators of the relations between the primary predictors (i.e., attitude extremity, political ideology) and the dependent measures of interest. First, it was predicted that biased assimilation would mediate the relation between attitude extremity and subsequent change in tax increase attitudes. Past work in the attitude polarization literature has found evidence that those with more extreme attitudes engage in more biased processing of information and that this biased assimilation accounts for differences in the attitude change among extreme versus moderate attitude holders (e.g., Lord et al., 1979; Miller et al., 1993). However, tests of mediation revealed no evidence that accuracy explained the observed relation between attitude extremity and either actual or perceived attitude change. It was also hypothesized that that mental rigidity would at least partially mediate the relation between political ideology and both directly assessed and self-reported change in attitudes toward tax increases. Past work in the political ideology literature has indicated that political conservatives demonstrate less cognitive flexibility (Jost et al., 2003a) and greater need for cognitive closure (e.g., Webster & Kruglanski, 1994; Jost et al., 2003a) than do political liberals and that this difference in mental rigidity accounts for greater resistance to change among conservatives. However, no direct relation was found between political ideology and either directly assessed or self-reported attitude change scores in Study 3, and mental rigidity (although correlated with political ideology) did not significantly predict computed or perceived attitude change. Therefore, mental rigidity did not emerge as a significant mediator in the relation between political ideology and attitude change.

Study 3 further revealed and clarified the relation between attitude extremity and attitude change, in terms of both directly calculated difference scores and self-reported evaluative movement. In addition, divergent patterns of both attitude extremity and the interaction of extremity and ideology were found across the two dependent measures, indicating a disconnect between real and reported attitude change.

## Study 4

Study 4 expanded upon the previous three studies in two primary ways. First, a new target issue, environmental preservation, was the focus. As the previous studies had focused upon social and economic issues, the fourth study incorporated a new topic in order to examine the relations among the primary variables of interest in the context of the preservation of land, wildlife, and natural resources. Second, a non-college sample was included in addition to the student sample in Study 4 in order to more accurately approximate the ideological and attitudinal parameters found in the broader US population. It was not expected that the non-college and college samples would differ in terms of the hypothesized effects on attitude change. Thus, the extent to which the previous findings (Studies 1-3) generalized beyond a college sample was assessed.

### **Hypothesis 1. Extremity of initial attitudes predicts attitude polarization.**

Consistent with the results of the previous three studies, a main effect for attitudinal extremity was again hypothesized, such that individuals expressing more extreme attitudes toward environmental preservation at the outset were expected to adopt even more extreme evaluative positions (i.e., polarize) following the presentation of mixed evidence, whereas those with relatively more moderate initial attitudes were expected to demonstrate more “willingness” to change in response to the mixed evidence, therefore resulting in depolarization of their pretest attitudes (Miller et al., 1993).

**Hypothesis 2. Political ideology predicts attitude polarization.** As in the first three studies, a main effect for political ideology was again hypothesized. Specifically, it was predicted that political conservatives would show more evidence of polarization than would political liberals. Ideology may not have emerged as a significant predictor in the previous

studies due to the social nature of the issues of abortion rights and gun control, as well as the salience of the issue of tax increases. As a different type of issue, environmental preservation, was employed in Study 4, the original hypothesis regarding a main effect for political ideology on attitude change was again advanced and tested.

**Hypothesis 3. Attitude extremity and political ideology interactively affect attitude polarization.** It was again expected that the effect of extremity of initial attitudes on subsequent polarization would depend upon political ideology. Specifically, conservatives were predicted to demonstrate attitude polarization in response to the mix of statements supporting and opposing environmental preservation, regardless of whether their initial attitudes about environmental preservation were relatively extreme or relatively moderate. Among liberals, however, it was anticipated that those holding extreme attitudes would be more apt to polarize, whereas individuals reporting moderate initial attitudes would show evidence of depolarization.

**Hypothesis 4. Biased assimilation mediates the link between attitude extremity and attitude polarization.** In keeping with the predictions of Studies 2 and 3, as well as research in the attitude polarization tradition, it was again hypothesized that accuracy would mediate the significant relation between extremity of initial attitudes and subsequent attitude change. Specifically, it was hypothesized that biased processing would at least partially mediate the extremity-polarization relation. That is, individuals holding extreme attitudes were expected to engage in more biased processing of the mixed evidence about environmental preservation than those holding moderate initial attitudes, and this discrepancy in processing, in turn, was expected to manifest as greater attitude polarization among extreme attitude-holders versus moderates.

**Hypothesis 5. Mental rigidity mediates the relation between political ideology and attitude polarization.** As in Study 3, it was hypothesized that differences in mental rigidity, in

terms of need for cognitive closure and cognitive flexibility, would at least partially mediate the relation between political ideology and attitude change. That is, political conservatives were expected to report higher levels of NCC and lower levels of cognitive flexibility than political liberals, and this discrepancy in mental rigidity, in turn, was predicted to manifest as greater attitude polarization among conservatives than among liberals.

## **Method**

### **Online Data Collection**

All data for Study 4 were collected via the online survey program SurveyMonkey. Thus, all participants registered for the study online and completed the study at their own convenience and at a location of their choosing. Participants were recruited through two sources: VCU Department of Psychology's SONA system (college sample) and Amazon's Mechanical Turk (non-college sample).

Mechanical Turk (MTurk) is a low-cost method for collecting data from a diverse, non-college sample. It has been employed in large-scale data collection since the service (originally used by Amazon to allow employees to check for duplicate items in the inventory) was adapted for general public use in 2005 (Kelley, 2010). Since then, over 200,000 study respondents have participated in studies advertised on the service. The benefits of MTurk as compared with other methods of survey data collection include a significant economic savings in time, effort, and cost. In addition, MTurk's viability as a data collection tool in human subjects research has been empirically tested and validated. In particular, studies about judgments, attitudes, and perceptions have been found to transfer quite easily from university settings to online completion via MTurk (e.g., Kelley, 2010; Sprouse, 2010).

In the current study, the use of MTurk allowed for the timely collection of data from a more diverse, non-college sample in addition to the convenience sample of undergraduate psychology students collected via VCU's SONA system. The set-up, advertising, and participant sign-up procedures for MTurk studies closely resembled the procedures used to enroll university participants in online studies via VCU's SONA system. A researcher (i.e., "MTurk Requester") account was established, allowing for the creation and advertising of the current study as a Human Intelligence Task (HIT) on the MTurk marketplace, an online forum where studies available for completion are listed. Individuals registered as potential participants in the MTurk system ("MTurk Workers") have access to this forum and can browse the studies (HITs) that have been created and posted by researchers and select the study(-ies) that they wish to take part in for minimal payment.

### **Participants**

**SONA Sample.** One hundred forty-two individuals enrolled in psychology courses at Virginia Commonwealth University participated in the study for one hour of research credit. As in the previous three studies, there were no exclusion criteria in regards to gender, race, or religious affiliation. The only requirements for participation were a minimum age of eighteen and fluency in English, as participants needed to be able to carefully read and evaluate a written argument. In addition, individuals who had participated in Studies 1, 2, or 3 were not eligible to take part in Study 4. Ten participants were excluded from analyses due to missing data or inappropriate completion (e.g., selecting the same response option for all items in a questionnaire containing reverse-coded items) of the study measures. The final SONA sample was therefore comprised of one hundred thirty-two participants (ninety-one women; 50% Caucasian, 19% Black, 17% Asian, 5% Hispanic, 2% Native American, and 7% "other").

**MTurk Sample.** Two hundred ninety individuals registered as MTurk workers participated in the study in exchange for 1.5 in Amazon dollars. As with the SONA sample, there were no exclusion criteria in regards to gender, race, or religious affiliation. The only requirements for participation were a minimum age of eighteen, not being currently enrolled in college, US residency, and fluency in English, as participants needed to be able to carefully read and evaluate a written argument. Eighty-three participants were excluded from analyses due to missing data or inappropriate completion (e.g., selecting the same response option for all items in a questionnaire containing reverse-coded items) of the study measures. The final MTurk sample was therefore comprised of two hundred seven participants (one hundred fifteen women; 87% Caucasian, 5% Black, 3% Asian, 2% Hispanic, 1% Native American, and 2% "other") representing thirty-eight states and the District of Columbia.

### **Measures and Materials**

**Pretest Attitudes Measure.** Participants' initial attitudes toward a variety of social issues were assessed using the same set of issue items employed in the first three studies (see Appendix A), employing 9-point semantic differential scales that ranged from -4 (negative) to +4 (positive) as in Study 3. Embedded in this series of questions was an item assessing views on the issue of environmental preservation, which served as the pretest attitude assessment.

**Social Networking Sites Essay.** The same series of statements describing the benefits and risks of using social networking sites developed and employed in the first three studies was again incorporated in Study 4 (Appendix B).

**Environmental Preservation Essay.** A series of statements supporting and opposing environmental preservation was developed (see Appendix L). Statements supporting environmental preservation centered on the need to preserve the nation's landscapes and wildlife,

management of public lands, and enforcement of environmental laws. Oppositional statements focused on the economic benefits of making use of public lands for infrastructure, agriculture, jobs, etc., and utilizing natural resources to reduce dependence on foreign energy sources. Arguments were adapted from the websites of organizations devoted to environmental preservation (e.g., the Sierra Club) as well as those advocating the development of national lands and resources (e.g., U.S. Department of Energy). Messages were standardized in terms of length and content, and the order of presentation of the supporting and opposing statements was counterbalanced, as in the previous studies.

**Posttest Attitudes Measure.** Participants' posttest attitudes toward environmental preservation were assessed using the same series of five items used in the previous three studies. The five posttest attitude items were averaged to form the composite posttest attitude score ( $\alpha = .97$ ), with higher values indicating greater positivity toward environmental preservation.

**Self-Reported Attitude Change.** As in Study 3, participants also reported their self-assessed attitude change on a 9-point scale ranging from -4 (much more against environmental preservation) to +4 (much more in favor of environmental preservation). This self-reported change item was incorporated in Study 4 and served as an additional dependent variable.

**Thought Listings.** Following the posttest attitude items, participants were again provided with eight blank spaces and asked to list, in each, one thought or fact that they recalled from the essay they had read on environmental preservation. The accuracy of these thought listings was subsequently rated by two independent coders, as in Studies 2 and 3. Paired comparisons of the accuracy ratings revealed that there was sufficient agreement between the coders ( $r_s > .72$ ), so average accuracy ratings for each thought listing were generated from the coders' paired ratings. These individual accuracy ratings were internally consistent ( $\alpha = .90$ ) and



were therefore averaged to create a composite accuracy variable, for which higher scores represented greater accuracy. This composite accuracy variable again served as the primary indicator of biased assimilation, as in Studies 2 and 3.

**Political Ideology Scale.** Political ideology was again assessed using the composite scale employed in the previous three studies (see Appendix D). After reverse-coding the self-reported ideology question and standardizing all items, the forty-five political ideology items were averaged to create a composite political ideology variable ( $\alpha = .94$ ), for which higher scores were indicative of a more conservative ideological orientation.

**Importance of Environmental Preservation.** As work by Petty and Cacioppo (1979) and Petty, Cacioppo, and Goldman (1981) has demonstrated, the degree of personal relevance that a particular topic has for an individual affects his or her motivation to cognitively elaborate on arguments surrounding it. Instead of assessing the importance that individuals placed upon politics generally, it was important to assess how much participants cared about the particular issue described and evaluated in Study 4, environmental preservation. Given that the more general importance of politics measure (IPQ) had not contributed directly or interactively to the prediction of attitude change scores in the previous three studies, it was removed and replaced by this measure of specific issue importance in Study 4. The importance participants placed on environmental preservation could moderate the effect of extremity and/or ideology on participants' attitudes toward the issue and arguments presented. To assess this potential motivational factor, an item addressing the importance participants placed on environmental preservation was incorporated in Study 4. This item read, "How important is environmental preservation to you personally?" with response options ranging from -3 (not important) to +3 (very important).

**Need for Cognition Scale.** As in Studies 2 and 3, participants completed Cacioppo and Petty's (1982) 18-item need for cognition scale (see Appendix H). After reverse-scoring the necessary items, the average of these eighteen items was computed to create a composite NFC score ( $\alpha = .91$ ), with higher scores indicating greater need for cognition.

**Need for Cognitive Closure Scale.** In order to gauge individual differences in need for cognitive closure, all participants completed the abbreviated Need for Cognitive Closure Scale (NCCS; see Appendix J), as in Study 3. In Study 4, these fifteen items were found to be highly correlated and internally consistent ( $\alpha = .87$ ), so their average was computed to create a composite NCCS variable, higher scores on which indicated greater need for cognitive closure.

**Cognitive Flexibility Scale.** The 12-item Cognitive Flexibility Scale (CFS; Martin & Rubin, 1995) was again included in order to assess individual differences in willingness to consider multiple options and alternatives, as well as self-efficacy in being flexible (Appendix K). The twelve CFS items were averaged to create a composite variable ( $\alpha = .79$ ). Higher scores on the composite CFS variable indicated greater cognitive flexibility.

**Demographics Questionnaire.** Finally, participants completed the demographics questionnaire (see Appendix F) assessing sex, marital status, ethnicity, religious affiliation, and hometown size.

## **Procedure**

**SONA participants.** The order of measures for Study 4 closely resembled that employed in the previous three studies. However, in order to more closely approximate the study experience of those in the non-college sample, participants in the college sample completed the study online instead of in the laboratory. After signing up to participate in the "Social Issues" study through SONA, participants followed a link to the study on

SurveyMonkey, an online company that enables the creation and administration of web surveys. After having read and agreed to an informed consent statement, participants provided their attitudes about environmental preservation, among several other issues, followed by the CFS. Participants then read the essay about social networking sites and evaluated the issue. Next, they read about and evaluated environmental preservation, indicated the importance they placed on the issue, completed the self-reported attitude change item, and completed the thought listings. Participants then completed the following measures: Need for Cognition (NFC), Need for Cognitive Closure Scale (NCCS), demographics, and Political Ideology (composite scale and self-identification item; PID). The next to last screen provided participants with a summary debriefing and included contact information should they have any questions regarding the study (none did). Finally, VCU participants provided their email address (which was subsequently removed from the data set to protect confidentiality) as a means of confirming completion of the online study and ensuring that they would receive credit in the SONA system.

**MTurk participants.** The study was advertised as a Human Intelligence Task (HIT) on the Mechanical Turk marketplace, making it available for unique MTurk participants to complete in return for 1.5 Amazon dollars. Participants were able to complete the study from any computer that allowed connection to the MTurk web site. Participants voluntarily created a log-in and password, granting them access to the Social Issues HIT. Once registered, participants followed a link to the study on SurveyMonkey, the same link provided to the college sample through SONA. After having read and agreed to an informed consent statement, participants provided their attitudes about environmental preservation, among several other issues, followed by the CFS. Participants then read about and evaluated social networking sites. Next, they read about and evaluated environmental preservation, indicated the importance they placed on the

issue, completed the self-reported attitude change item, and completed thought listings. Participants then completed the following measures: Need for Cognition (NFC), Need for Cognitive Closure Scale (NCCS), demographics, and Political Ideology (composite scale and self-identification item; PID). The next to last screen provided participants with a summary debriefing and included contact information should they have any questions regarding the study (none did). Finally, MTurk participants generated a unique eight-digit code (which was subsequently removed from the data set to protect confidentiality) as a means of confirming completion of the online study and ensuring that they would receive credit for completion on the MTurk system. Following confirmation of completion, MTurk participants received 1.5 Amazon dollars for their time and effort.

## **Results**

### **Descriptive Statistics**

Descriptive statistics for the primary variables of interest in Study 4 are presented in Table 4. Before proceeding with tests of the study's main hypotheses, the data were checked to ensure that assumptions of normality, linearity, and homogeneity of variance were met. The pretest attitude (Skewness = -1.34,  $SE = 0.13$ ), posttest attitude (Skewness = -1.11,  $SE = 0.13$ ), importance of environmental preservation (Skewness = -1.02,  $SE = 0.13$ ), and accuracy (Skewness = -1.11,  $SE = 0.13$ ) variables were found to be negatively skewed. In addition, self-reported attitude change scores were found to be positively skewed (Skewness = 1.95,  $SE = 0.13$ ). In order to correct for this non-normality, log transformations were performed on these five variables. Following transformation, much improved fit statistics were found for pretest attitudes (Skewness = -0.36,  $SE = 0.13$ ), posttest attitudes (Skewness = -0.16,  $SE = 0.13$ ), importance of environmental preservation (Skewness = -0.18,  $SE = 0.13$ ), accuracy (Skewness =

-0.14,  $SE = 0.13$ , and self-reported attitude change (Skewness = 0.61,  $SE = 0.13$ ). As such, subsequent analyses were conducted using these transformed variables. All other variables of interest were found to meet the assumptions of normality, linearity, and homogeneity of variance, making it appropriate to run analyses with these data in their original form. As in the previous three studies, the composite measure of political ideology was not significantly skewed (Skewness = 0.15,  $SE = 0.13$ ) and did not indicate any restriction of range or variability, indicating that the sample was not biased in terms of its ideological composition.

Table 4.

*Descriptive Statistics for Study 4*

Variable	<i>M (SD)</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>SE<sub>Sk</sub></i>
Pretest Environmental Preservation Attitude	7.34 (1.97)	1.00	9.00	-1.34	0.13
Posttest Environmental Preservation Attitude	7.38 (1.69)	1.00	9.00	-1.11	0.13
Self-Reported Attitude Change	0.49 (1.10)	-1.00	4.00	1.95	0.13
Political Ideology Composite <sup>1</sup>	2.60 (0.65)	1.00	4.40	0.13	0.13
Self-Identified Ideology <sup>1</sup>	4.57 (2.14)	1.00	9.00	0.15	0.13
Need for Cognition	3.54 (0.72)	1.33	4.78	-0.64	0.13
Accuracy	3.36 (0.65)	1.00	5.00	-1.11	0.13
Cognitive Flexibility	4.72 (0.61)	2.42	6.00	-0.61	0.13
Need for Cognitive Closure	3.84 (0.76)	1.73	5.87	-0.05	0.13
Importance of Environmental Preservation	5.50 (1.61)	1.00	7.00	-1.02	0.13

<sup>1</sup> higher values = more conservative

Comparisons were made between the SONA and MTurk samples to determine if they differed in terms of the primary variables of interest. No differences were found between the two samples in regards to pre- or posttest attitudes, self-reported attitude change, composite or self-reported political ideology, importance of environmental preservation, or need for cognitive closure (all  $ps > .11$ ). The only three significant differences were found for the variables of need for cognition, cognitive flexibility, and accuracy. The SONA sample demonstrated significantly lower need for cognition scores ( $M = 3.35, SD = 0.60$ ) than the MTurk sample ( $M = 3.68, SD = 0.76$ ),  $t(338) = 4.25, p < .001$ . In addition, greater cognitive flexibility was observed in the MTurk sample ( $M = 4.79, SD = 0.58$ ) than in the SONA sample ( $M = 4.60, SD = 0.64$ ),  $t(338) = 2.87, p < .01$ . Finally, the thought listings of the MTurk sample were significantly more accurate ( $M = 3.50, SD = 0.50$ ) than the thought listings of the SONA sample ( $M = 3.12, SD = 0.79$ ),  $t(323) = 4.37, p < .001$ .

### **Tests of Main Hypotheses**

The main purpose of the current study was to test the effects of attitude extremity and political ideology on changes in attitudes toward environmental preservation. As in Study 3, two conceptualizations of attitude change were employed as dependent variables. First, a direct assessment of change in participants' attitudes from pre- to posttest (i.e., before versus after encountering the environmental preservation essay) was employed. The difference score was computed in the same way as in the previous studies, with positive values indicating a positive evaluative shift and negative values indicating a negative evaluative shift. In addition, the item assessing self-reported change in attitudes toward environmental preservation (log transformed)

was employed as a second dependent variable. These two measures of attitude change did not significantly correlate with one another ( $r = .07$ ), so they were analyzed separately.<sup>5</sup>

**Effects on difference scores.** In order to examine both main and interactive effects of attitude extremity, political ideology (PID), and participant type on attitude difference scores, a hierarchical regression analysis was conducted. Also, given that the personal relevance of a specific persuasive target can affect attention to and impressions of arguments about it (e.g., Petty & Cacioppo, 1979), importance of environmental preservation was included as a fourth predictor variable. Attitude extremity was operationalized as in the previous three studies (i.e., pretest attitude squared), such that higher values indicated more extreme initial attitudes toward environmental preservation. The attitude extremity, political ideology, and importance of environmental preservation variables were centered to reduce collinearity, and the participant type variable was dummy coded (0 = “MTurk,” 1 = “SONA”) in accordance with Aiken and West (1991). The dummy coded participant type variable, along with the centered attitude extremity, political ideology, and importance of environmental preservation variables, were entered in Step 1. The six two-way interactions among attitude extremity, political ideology, and participant type, and importance of environmental preservation (i.e., extremity X PID, extremity X type, PID X type, extremity X EPI, PID X EPI, type X EPI) were entered in Step 2. The four three-way interactions of extremity, ideology, participant type, and importance (i.e., extremity X PID X type, extremity X PID X EPI, extremity X type X EPI, PID X type X EPI) were entered in

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<sup>5</sup> In addition to exploring the effects of attitude extremity, political ideology, and importance of environmental preservation on both directly assessed and self-reported attitude change, direct and interactive effects of gender, NFC, accuracy, and mental rigidity were also examined. However, hierarchical regressions revealed no significant direct or interactive effects of gender, NFC, accuracy, or mental rigidity, ( $ps > .06$ ) for either dependent measure.

Step 3. Finally, the four-way interaction among all four predictor variables (i.e., extremity X PID X type X EPI) was entered in Step 4.

The first model of the regression analysis predicted significant unique variance in environmental preservation attitude difference scores,  $F(4,331) = 35.12, p < .001, R^2 = .30$ . This significance was driven by two main effects. First, attitude extremity significantly predicted attitude difference scores,  $B = -0.15, t(338) = -11.48, p < .001$ . Specifically, individuals espousing more moderate attitudes toward environmental preservation became more evaluatively positive, whereas those expressing extreme attitudes demonstrated negative change. Second, importance of environmental preservation also emerged as a significant predictor of directly assessed attitude change,  $B = 0.09, t(338) = 7.13, p < .001$ . Whereas individuals who viewed the target issue as relatively less important became more negative in their evaluations, those for whom environmental preservation was relatively more important tended not to change their attitudes. Neither political ideology nor participant type emerged as significant predictors.

Model 2 also predicted significant unique variance in environmental preservation attitude difference scores,  $F(6,325) = 3.06, p < .01, R^2 = .04$ . Three of the six two-way interactions significantly predicted attitude change. First, there was a significant attitude extremity X political ideology interaction,  $B = 0.03, t(338) = 2.28, p < .03$  (see Figure 6). Simple slopes analyses (Aiken & West, 1991) were conducted to decompose the interaction. Liberal individuals (-1 SD) with more extreme initial attitudes became more negative in their attitudes toward environmental preservation, whereas liberals with more moderate attitudes became more positive,  $B = -0.18, t(338) = -7.40, p < .001$ . For more conservative participants (+1 SD), this same significant pattern emerged but in an attenuated form,  $B = -0.12, t(338) = -6.10, p < .001$ . This pattern suggests that the main effect of attitude extremity on attitude difference scores was



stronger for political liberals than for political conservatives, with moderates getting more positive and extremes becoming more negative in their evaluations of environmental preservation.

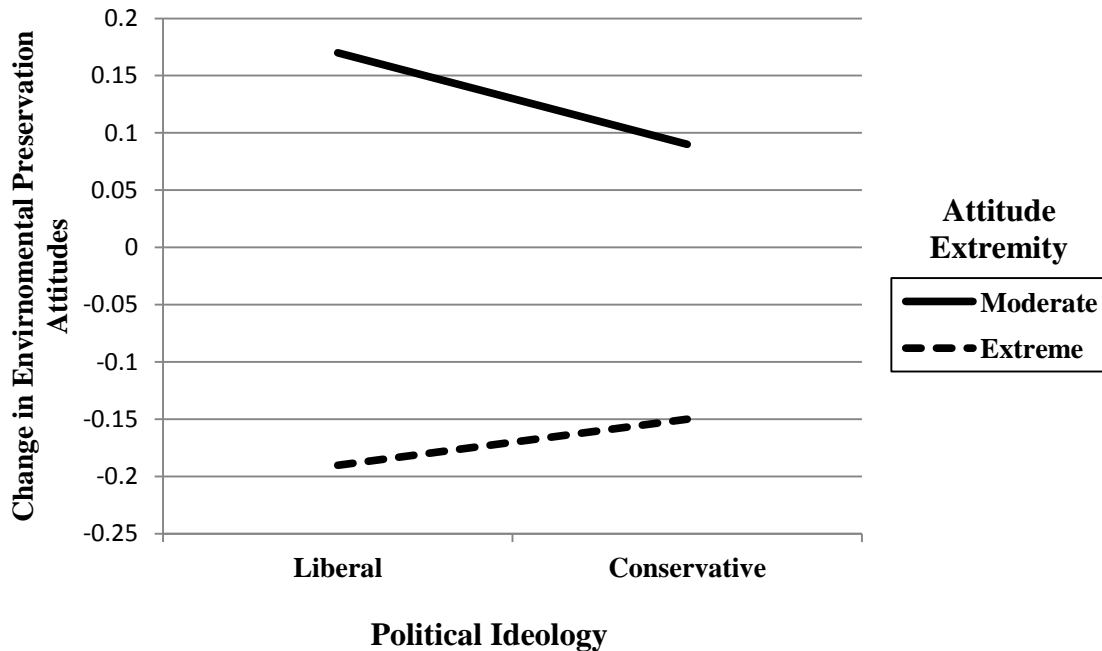


Figure 6. Environmental preservation attitude difference scores as a function of political ideology and attitude extremity at one standard deviation above and below the mean (Study 4).

Second, the interaction of political ideology and participant type significantly predicted differences in environmental preservation attitudes,  $B = -0.06$ ,  $t(338) = -2.13$ ,  $p < .04$  (see Figure 7). Simple slopes analyses revealed that, among SONA participants, political ideology significantly predicted attitude difference scores,  $B = -0.05$ ,  $t(131) = -2.05$ ,  $p < .04$ , such that liberals tended not to change and conservatives demonstrated negative change. For MTurk participants, however, political ideology was not related to differences in environmental preservation attitudes from pre- to posttest,  $B = -0.00$ ,  $t(206) = -0.24$ ,  $p = .81$ . Consistent with this, the effect of participant type was significant for conservatives,  $B = -0.08$ ,  $t(338) = -2.41$ ,  $p <$

.02, but not liberals  $B = 0.03$ ,  $t(338) = 0.84$ ,  $p = .40$ . The significant interaction between political ideology and participant type was therefore driven by the negative shift in attitudes found among more conservative SONA participants.

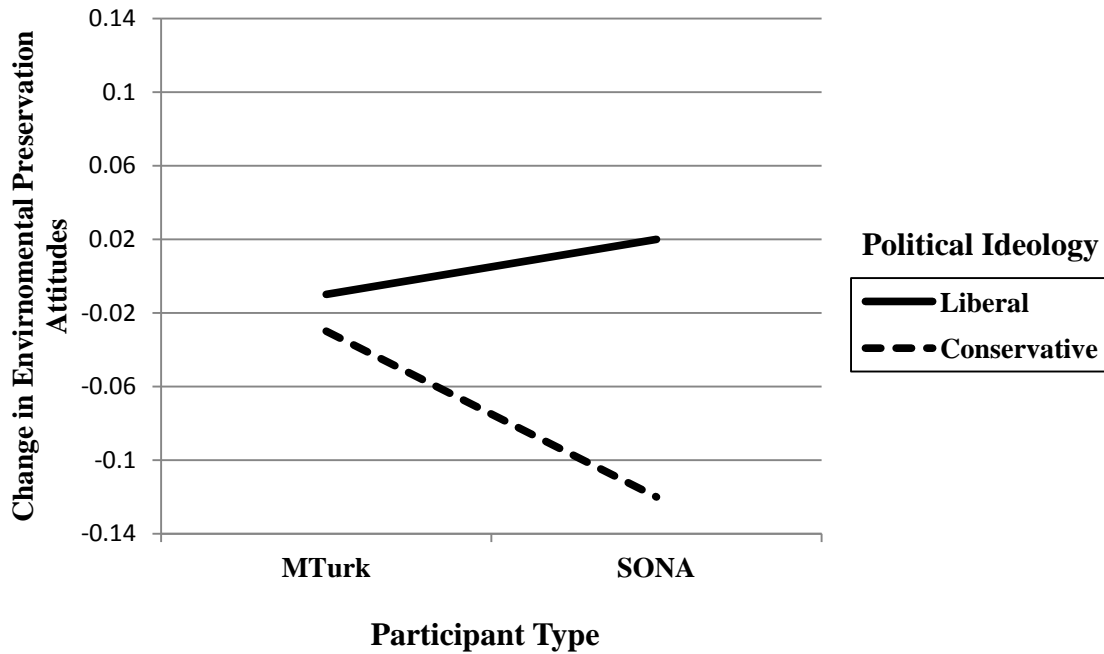


Figure 7. Environmental preservation attitude difference scores as a function of participant type and political ideology at one standard deviation above and below the mean (Study 4).

Third, a significant interaction between political ideology and importance of environmental preservation was found,  $B = -0.04$ ,  $t(338) = -3.09$ ,  $p < .01$  (see Figure 8). Simple slopes analyses revealed that the relation between importance and directly assessed attitude change differed based upon ideology. Among liberal participants, those who assigned greater importance to environmental preservation became more positive about the issue, whereas those viewing the issue as less important demonstrated negative change,  $B = 0.14$ ,  $t(338) = 5.66$ ,  $p < .001$ . The same general pattern was found among conservative individuals but in an attenuated form,  $B = 0.06$ ,  $t(338) = 3.46$ ,  $p < .001$ . In addition, ideology predicted attitude difference scores

among those who were higher in importance of environmental preservation,  $B = -0.05$ ,  $t(338) = -2.40$ ,  $p < .02$  (with liberals showing more positive change than conservatives) but not among those who viewed the issue as less important,  $B = 0.03$ ,  $t(338) = 1.83$ ,  $p > .07$ . These findings suggest that those for whom environmental preservation was important demonstrated positive change, whereas those viewing the issue as less important demonstrated negative change – and that this effect was more pronounced among liberals than among conservatives.

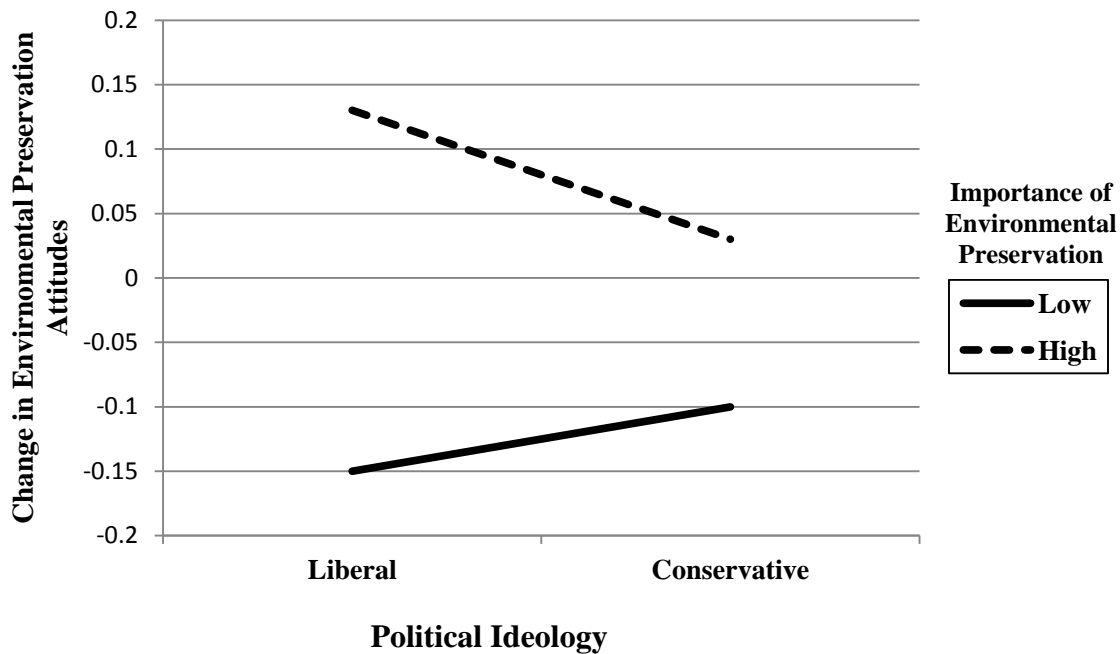


Figure 8. Environmental preservation attitude difference scores as a function of political ideology and importance of environmental preservation at one standard deviation above and below the mean (Study 4).

Unlike the first two models, Models 3 and 4 did not predict significant unique variance in environmental preservation attitude difference scores ( $ps > .08$ ). The only additional significant effect was the three-way interaction among attitude extremity, participant type, and importance of environmental preservation,  $B = 0.06$ ,  $t(338) = 2.32$ ,  $p = .02$  (see Figure 9).

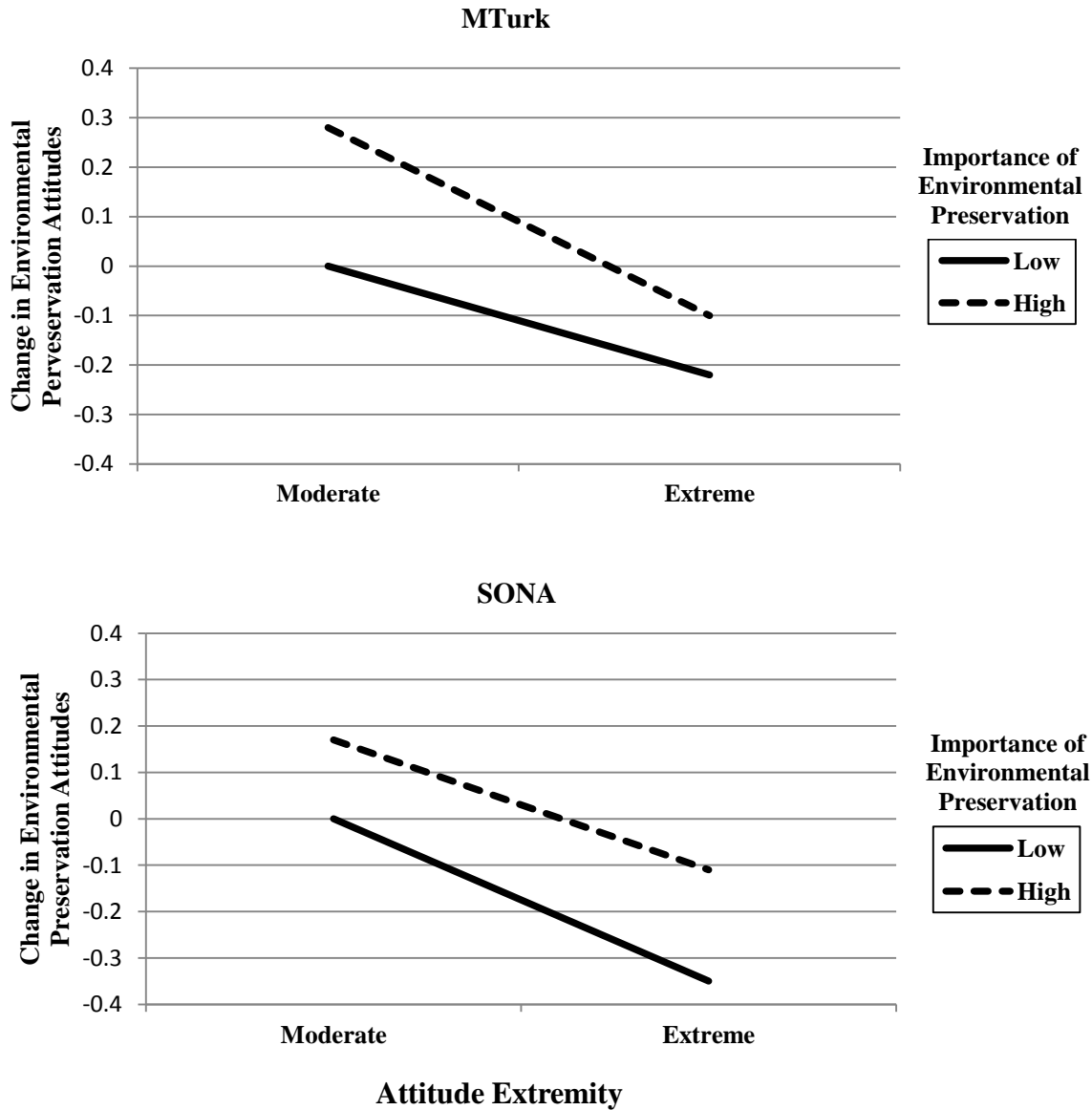


Figure 9. Environmental preservation attitude difference scores as a function of participant type, attitude extremity, and importance of environmental preservation at one standard deviation above and below the mean (Study 4).

To examine this pattern, regression models predicting the effects of participant type at high and low levels of extremity and issue importance were run. Participant type emerged as a significant predictor of attitude difference scores only for individuals with relatively extreme attitudes who also viewed the issue of environmental preservation as less important,  $B = -0.13$ ,  $t(338) = -2.10$ ,  $p < .04$ . Among this particular subgroup, SONA participants became more evaluatively negative than did MTurk participants. The results of these analyses indicated that individuals with relatively extreme attitudes who also viewed environmental preservation as less important became more negative than the other participants – and that this perception of negative change was stronger among SONA participants than MTurk participants.

**Effects on self-reported attitude change.** A hierarchical regression was also conducted to investigate the effects of attitude extremity, political ideology, participant type, and their interactions on participants' self-reported change in attitudes toward environmental preservation. As previously described, the original self-reported change variable was highly negatively skewed and demonstrated limited variability. Approximately 25% of participants reported becoming more positive about environmental preservation from pre- to posttest ( $n = 82$ ), but only eleven participants reported that their attitudes toward environmental preservation had changed in a negative direction, and the nearly three-quarters of participants ( $n = 246$ ) indicated that their attitudes toward environmental preservation had not changed at all (i.e., self-reported change of zero). This pattern is not inconsistent with what might be expected, given that social desirability concerns likely discouraged some participants from truthfully reporting that they had become less supportive of preserving the environment. In order to correct for the non-normal distribution of self-reported attitude change scores, the original factor was log transformed, and all subsequent analyses were conducted on this transformed self-reported change factor.

As in the analyses predicting directly assessed change scores, importance of environmental preservation was included as well in order to examine if this motivational factor directly or interactively affected perceived attitude change (log transformed). The centered attitude extremity, political ideology, and importance of environmental preservation (EPI) variables, along with the dummy coded participant type variable, were entered in Step 1. The six two-way interactions among attitude extremity, political ideology, participant type, and importance of environmental preservation (i.e., extremity X PID, extremity X type, PID X type, extremity X EPI, PID X EPI, type X EPI) were entered in Step 2. The four three-way interactions of extremity, ideology, participant type, and importance (i.e., extremity X PID X type, extremity X PID X EPI, extremity X type X EPI, PID X type X EPI) were entered in Step 3. Finally, the four-way interaction among all four predictor variables (i.e., extremity X PID X type X EPI) was entered in Step 4.

The first model of the regression analysis was significant,  $F(4,331) = 5.21, p < .001, R^2 = .06$ . This significance was driven by two main effects. First, as with the prediction of environmental preservation difference scores, attitude extremity significantly predicted self-reported attitude change,  $B = -0.01, t(338) = -2.73, p < .01$ , with those expressing more moderate attitudes reporting that they had become more positive than individuals with more extreme initial evaluations. Second, a main effect of importance of environmental preservation was also found,  $B = 0.02, t(338) = 4.20, p < .001$ , such that participants who placed greater importance on environmental preservation reported becoming more positive than those who viewed environmental preservation as relatively less important.

The second model also contributed significantly to the prediction of self-reported change scores,  $F(6,325) = 2.59, p < .02, R^2 = .04$ . This was due to two significant two-way interactions.

First, a significant political ideology X participant type interaction was found,  $B = 0.03$ ,  $t(338) = 2.48$ ,  $p < .02$  (see Figure 10). Simple slopes analyses revealed that, although political ideology did not significantly predict self-reported change scores among MTurk participants ( $B = -0.01$ ,  $t(206) = -1.19$ ,  $p = .24$ ), differences between liberals and conservatives were found among SONA participants ( $B = 0.02$ ,  $t(131) = 2.22$ ,  $p < .03$ ). Specifically, SONA participants who were more conservative reported more positive attitude change than did their liberal counterparts. This pattern suggests that the overall interaction between participant type and political ideology was driven by conservative SONA participants, who reported becoming more positive in their attitudes toward environmental preservation than any other participants.

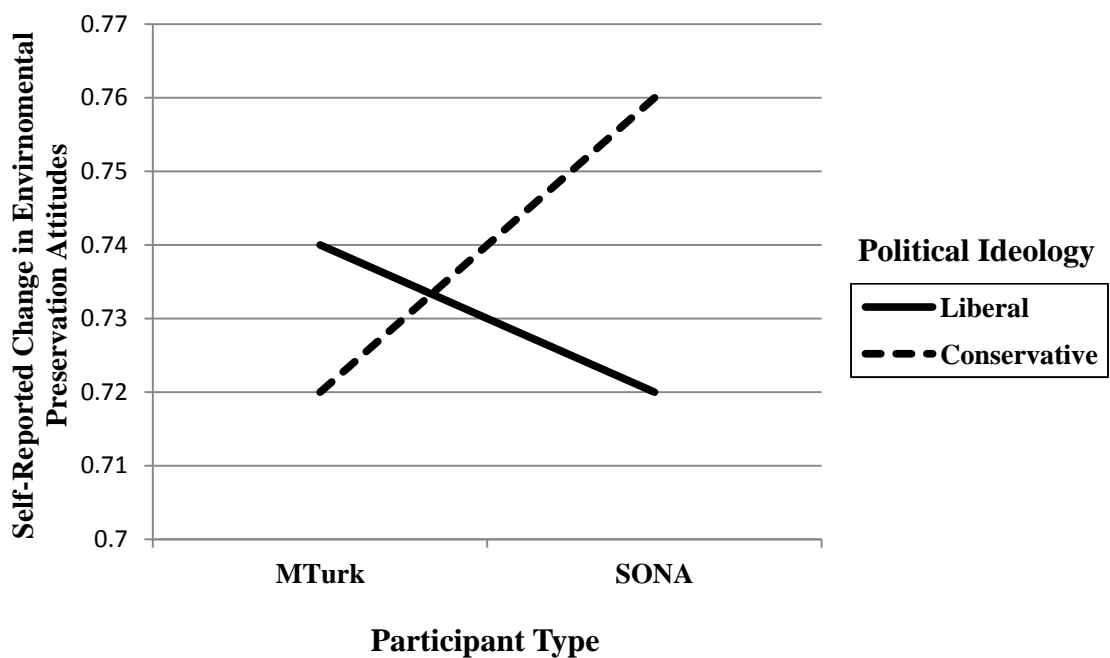


Figure 10. Self-reported change in environmental preservation attitudes (log transformed) as a function of participant type and political ideology at one standard deviation above and below the mean (Study 4).

In addition to the significant political ideology X participant type interaction, the two-way interaction between attitude extremity and importance placed on environmental preservation also significantly predicted self-reported attitude change scores,  $B = -0.01$ ,  $t(338) = -2.00$ ,  $p < .05$  (see Figure 11). Simple slopes analyses indicated that, among those who considered environmental preservation to be more important, moderate attitudes were associated with more self-reported positive change than were extreme attitudes,  $B = -0.03$ ,  $t(338) = -3.28$ ,  $p < .01$ . Attitude extremity did not predict perceived attitude change scores for individuals who viewed environmental preservation as relatively less important,  $B = -0.01$ ,  $t(338) = -0.93$ ,  $p = .35$ ). This pattern indicates that individuals with moderate attitudes about the topic who also viewed it as relatively more important reported more positive change than did the other combinations of issue importance and attitude extremity.

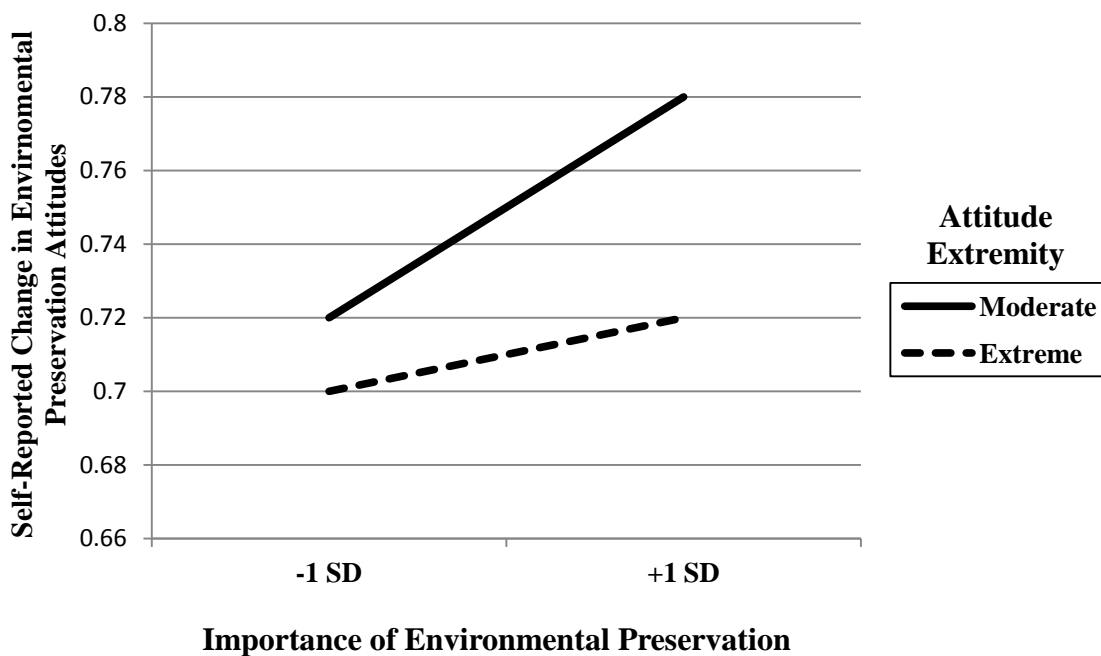


Figure 11. Self-reported change in environmental preservation attitudes (log transformed) as a function of importance of environmental preservation and attitude extremity at one standard deviation above and below the mean (Study 4).



Model 3 in the overall regression analysis did not predict significant unique variance in ratings of self-assessed attitude change. However, a significant three-way interaction was found among political ideology, participant type, and importance of environmental preservation,  $B = 0.03$ ,  $t(338) = 2.22$ ,  $p < .03$  (see Figure 12). To decompose this pattern, regression models predicting the effects of participant type at high and low levels of political ideology and issue importance were run. Participant type emerged as a significant predictor of self-reported attitude change only for conservative individuals who also viewed the issue of environmental preservation as relatively more important,  $B = 0.07$ ,  $t(338) = 3.31$ ,  $p = .001$ . Among this particular subgroup, SONA participants reported more positive evaluative shifting than did MTurk participants. The results of these analyses indicated that conservative SONA participants who also viewed environmental preservation as more important reported becoming more positive than the other participants in Study 4.

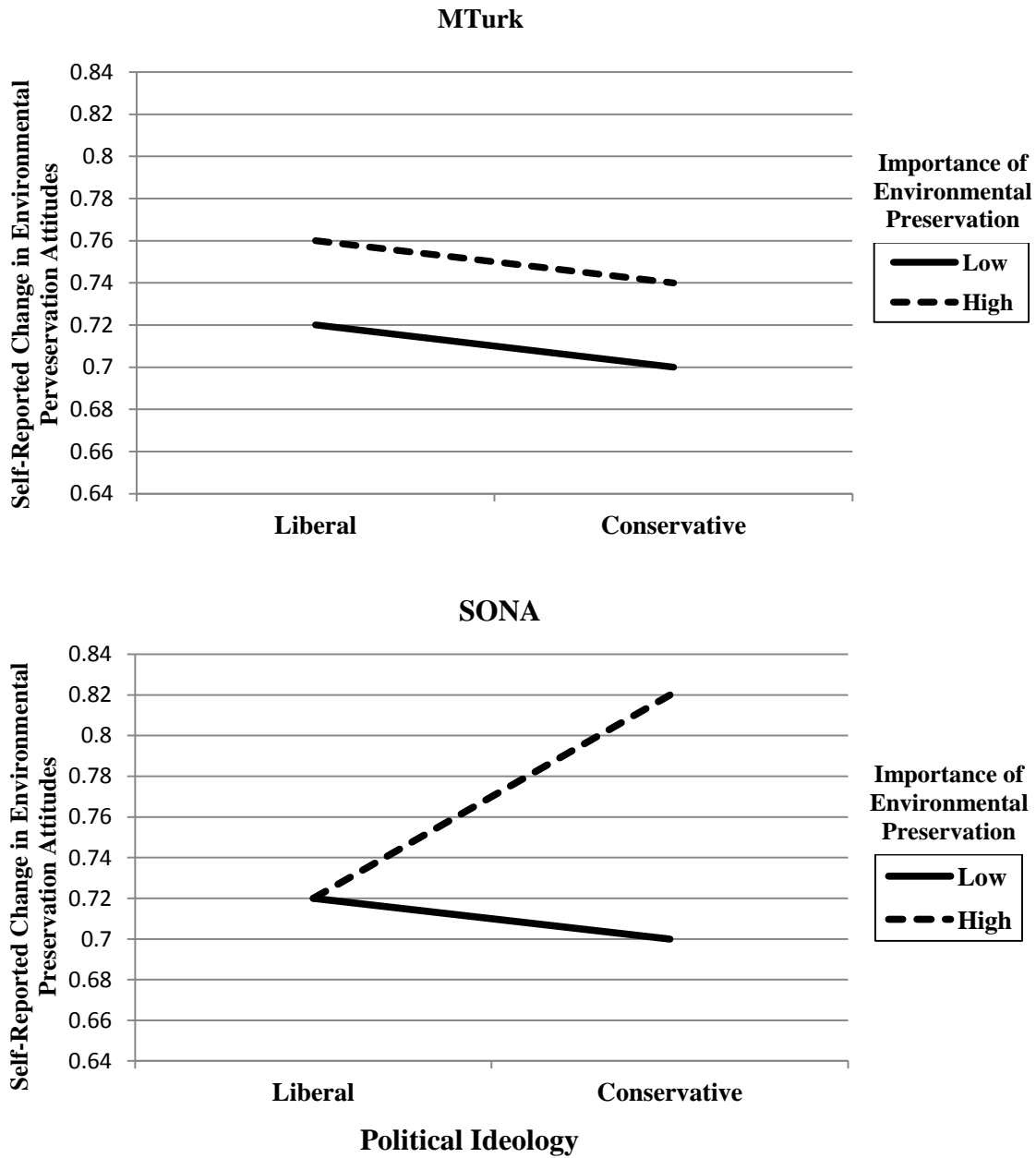


Figure 12. Self-reported change in environmental preservation attitude difference scores (log transformed) as a function of participant type, political ideology, and importance of environmental preservation at one standard deviation above and below the mean (Study 4).

### **Accuracy as a Mediator of the Extremity-Polarization Relation**

It was hypothesized that differences in biased assimilation would at least partially mediate the extremity-polarization relation in Study 4. Attitude extremity significantly predicted directly assessed attitude change (i.e., posttest – pretest difference score),  $B = -0.09$ ,  $t(338) = -8.13$ ,  $p < .001$ , and attitude extremity predicted accuracy,  $B = 0.13$ ,  $t(338) = 2.36$ ,  $p < .02$ . However, attitude extremity did not predict self-reported attitude change scores,  $B = -.00$ ,  $t(338) = -0.45$ ,  $p = .66$ . Moreover, accuracy did not predict attitude change as assessed by either difference scores or self-reported change,  $ps > .11$ . Thus, there was no evidence of biased assimilation as a mediator of the extremity-polarization association.

### **Mental Rigidity as a Mediator of the Ideology-Polarization Relation**

As both cognitive flexibility and need for cognitive closure speak to the general characteristic of mental rigidity, the two measures (i.e., NCCS and CFS) were again combined to create a composite variable indicating general mental rigidity. As in Study 3, items from the CFS were first reverse-coded, so that higher values indicated less cognitive flexibility. Then, all items in the NCCS and reverse CFS were standardized. All twenty-seven standardized items were found to correlate highly and demonstrated satisfactory internal consistency ( $\alpha = .75$ ), so a composite variable assessing general mental rigidity was created, with higher values being indicative of greater mental rigidity.

It was hypothesized that differences in mental rigidity would at least partially mediate the relation between political ideology and environmental preservation attitude change in Study 4. Although political ideology did not emerge as a significant predictor of either difference scores ( $B = -0.00$ ,  $t(338) = 0.31$ ,  $p = .76$ ) or self-reported change ( $B = -0.01$ ,  $t(338) = -0.21$ ,  $p = .83$ ), mediation could still occur in the absence of a significant direct association between predictor

and outcome variable (Kenny, 2011). Tests of mediation were therefore conducted, despite the lack of a consistent significant effect of political ideology on the dependent measures of interest. Analyses revealed that political ideology did predict mental rigidity,  $B = 0.26$ ,  $t(338) = 4.95$ ,  $p < .001$ , such that greater mental rigidity was associated with greater conservatism. However, mental rigidity did not predict attitude change as assessed by either the difference score or self-reported change,  $ps > .23$ .<sup>6</sup> Thus, there was no evidence that mental rigidity mediated the relation between political ideology and either actual or perceived attitude change in Study 4.

### Conclusions

Study 4 extended the findings of the first three studies and provided further information regarding the relations among attitude extremity, political ideology, and attitude change following exposure to mixed evidence about a target issue. As in Study 3, the inclusion of a measure of self-reported attitude change allowed for the examination and comparison of the effects of the primary predictors (i.e., extremity and ideology) on both actual and perceived changes in attitudes toward the target issue, environmental preservation. In addition, Study 4 incorporated a large, non-college sample to complement VCU participants. This broader sample enabled me to examine if and how result patterns differed between the two samples, thereby providing an indication of the generalizability of the studies' findings. Although some effects and interactions involving the other predictors were found to differ in the MTurk and SONA subsamples (described below), no main effect of participant type emerged in the analyses predicting directly assessed or self-reported change in attitudes toward environmental preservation.

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<sup>6</sup> Mediation analyses were also conducted employing NCCS and CFS as potential mediators of the ideology-attitude change relation. As these analyses revealed the same pattern of results as those conducted on the overall composite mental rigidity variable, only mediation analyses involving mental rigidity are described.

Several significant effects emerged in Study 4. First, a robust main effect for attitude extremity was again found in the prediction of both directly assessed and self-reported attitude change. Participants espousing more extreme attitudes toward environmental preservation demonstrated a negative evaluative shift from pre- to posttest, whereas those expressing more moderate initial attitudes became more positive. Similarly, participants with extreme attitudes perceived that they had not become as positive toward the target issue as had moderate attitude holders. Given that the distribution of pretest attitudes toward environmental preservation was negatively skewed, the overall pattern of negative attitude change (both directly assessed and self-reported) among extreme attitude holders suggests that those with initially extreme attitudes actually became less extreme in their evaluative position, or depolarized, following presentation of the mixed information about the target issue. Also, the robustness of this main effect in terms of predicting environmental preservation attitude difference scores, coupled with its consistent pattern across both directly assessed and self-reported attitude change (something not found in Study 3) may speak to the passion and conviction with which attitudes on this particular issue were held.

Study 4 also examined the effect of political ideology on both attitude difference scores and perceived attitude change. It was hypothesized that political conservatives would demonstrate polarization of their initial attitudes, whereas political liberals were expected to depolarize. However, political ideology did not emerge as a significant predictor of either directly assessed or self-reported change in environmental preservation attitudes. As in the previous studies, the sample was not skewed or restricted in regards to ideology, making it highly unlikely that the lack of political ideology main effect could be accounted for by a lack of ideological variability in the sample. Interestingly, although political ideology did not predict

directly assessed or self-reported attitude change among MTurk participants, ideology did significantly predict both actual and perceived attitude change among participants in the SONA subsample. Specifically, conservative SONA participants demonstrated more negative attitude change than their liberal counterparts in terms of difference scores (Figure 7), and yet the self-reported change scores of SONA conservatives were more positive than any other combination of ideology and participant type in the overall sample (Figure 10). It would appear that conservative participants in the SONA subsample not only demonstrated more actual change in their attitudes toward environmental preservation than the rest of the participants but also were relatively inconsistent in reporting the magnitude and direction of that evaluative shift.

In addition to the hypothesized main effects, an interactive effect for attitude extremity and political ideology was also predicted. In Study 4, this interaction significantly predicted directly assessed changes in attitudes toward environmental preservation. Specifically, the effect of attitude extremity on difference scores (such that those with moderate initial attitudes became more positive and those with extreme attitudes became more negative) was more pronounced among liberal participants than among their more conservative counterparts (Figure 6). It could be that the general openness associated with a politically liberal orientation (e.g., Jost et al., 2003a) manifested as a more magnified difference between extreme and moderate attitude holders than that found among more conservative participants in Study 4. In essence, liberal individuals' relative openness may have led them to shift their environmental preservation attitudes in either a negative (if extreme initial attitudes) or positive (if initially moderate) direction to a greater extent than their conservative counterparts. In contrast to the predictive pattern found for directly assessed attitude change scores, the interaction of attitude extremity

and political ideology did not significantly predict (transformed) self-reported change in attitudes toward environmental preservation.

The fourth and fifth hypotheses advanced in Study 4 proposed two factors as mediators of the relations between the primary predictors (i.e., attitude extremity, political ideology) and the dependent measures of interest. First, it was predicted that biased assimilation would mediate the relation between attitude extremity and subsequent change in environmental preservation attitudes. Past work in the attitude polarization literature has found evidence that those with more extreme attitudes engage in more biased processing of information and that this biased assimilation accounts for differences in the attitude change among extreme versus moderate attitude holders (e.g., Lord et al., 1979; Miller et al., 1993). As in the previous study, however, tests of mediation revealed no evidence that accuracy explained the observed relation between attitude extremity and either actual or perceived attitude change. It was also hypothesized that mental rigidity would at least partially mediate the relation between political ideology and both directly assessed and self-reported change in attitudes toward environmental preservation, drawing from work in the political ideology literature associating conservatism with higher need for cognitive closure (e.g., Webster & Kruglanski, 1994; Jost et al., 2003a) and lower cognitive flexibility (e.g., Jost et al., 2003a) than political liberals. As in Study 3, no direct relation was found between political ideology and either directly assessed or self-reported attitude change scores, and mental rigidity (although correlated with political ideology) did not significantly predict these two dependent measures. Therefore, mental rigidity did not mediate the relation between political ideology and actual or perceived attitude change in environmental preservation attitudes in Study 4.

In addition to the hypothesized effects, individual differences related to the importance placed on environmental preservation predicted actual and perceived attitude change in Study 4. A main effect of importance of environmental preservation was found in regression analyses predicting difference scores, with those viewing the issue as relatively more important resisting change and those for whom environmental preservation was seen as less important demonstrating negative change. This pattern would seem in keeping with much of the attitude polarization literature, and particularly work by Harton and Latané (1997) suggesting that increased issue involvement is associated with change resistance and attitude polarization. Moreover, importance placed upon the issue of environmental preservation was also found to interact with both attitude extremity and political ideology in predicting directly assessed and self-reported attitude change.

These general patterns seem to indicate that viewing environmental preservation as an important issue was associated with both demonstrated and reported positive attitude change if such a shift was possible (and change resistance if it was not). For instance, participants who viewed environmental preservation as relatively more important and also expressed moderate pretest attitudes reported becoming more positive in their evaluations than did the rest of the sample (Figure 11). Also, liberals for whom environmental preservation was relatively more important became more evaluatively positive than did conservatives or liberals who viewed the issue as less important (Figure 8). Conservative SONA participants who viewed the target issue as relatively more important reported that they had become more positive in their evaluations of environmental preservation relative to the rest of the sample (Figure 12). In contrast, those for whom the target issue was less important did not demonstrate this propensity or desire to become more evaluatively positive. For instance, SONA participants with extreme initial attitudes who



also viewed the target issue as relatively less important demonstrated a larger negative evaluative shift than did any other participants in Study 4 (Figure 9).

Study 4 built upon the findings of the previous three studies regarding the relations among attitude extremity, political ideology, and attitude change, in terms of both directly calculated difference scores and self-reported evaluative movement. Moderating effects of the importance placed on the target issue were also found, indicating that individual differences in motivation and personal relevance colored the associations between extremity, ideology, and subsequent change. In addition, some effect patterns differed for the college (i.e., SONA) versus non-college (i.e., MTurk) samples, suggesting that the two subsamples may have weighed the particular influence of various predictors to differing extents and in different combinations. Ultimately, however, many result patterns emerged consistently across both subsamples, lending credence to the generalizability of the findings.

## General Discussion

The goal of the present research was to examine how the extremity of initial attitudes and political ideology affect persuasion. Across four studies, the relations among attitude extremity, political ideology, and attitude change were examined. Study 1 laid the foundation for the subsequent studies by exploring the associations among the primary variables of interest in near isolation. Each subsequent study then incorporated new elements (i.e., different target issues, individual difference factors, conceptualizations of attitude change, and sample compositions) in order to both replicate and broaden the scope of the findings of the first study, as well as past work in the attitude polarization tradition. Across the four studies, several notable and interesting effect patterns emerged: Some were in keeping with the original hypotheses, some failed to appear, and still others emerged unexpectedly.

### Hypothesized Effects

**Attitude extremity.** The first original hypothesis concerned the relation between attitude extremity and attitude polarization. A substantial body of work in the attitude polarization tradition (e.g., Lord et al., 1979, Miller et al., 1993, Boysen & Vogel, 2007, 2008) has found evidence that extreme initial attitudes about a target tend to become entrenched or evaluatively more intense following the presentation of a mixture of statements that both support and oppose one's espoused view. This resistance to changing one's attitudes or the adoption of a more extreme evaluative position following exposure to mixed evidence is known as attitude polarization. In contrast, initial evaluations that are relatively more moderate tend to be associated with an attenuation of the attitude, or depolarization, after encountering mixed evidence. Based upon work in the attitude polarization tradition, a main effect of attitude extremity was therefore hypothesized in the current studies. Specifically, it was expected that

individuals with more extreme attitudes about the target issues would demonstrate resistance to changing their evaluative positions or even become more evaluatively extreme after having read a written piece comprised of both supporting and oppositional statements. Participants espousing more moderate attitudes, on the other hand, were expected to demonstrate depolarization of their attitudes when presented with the mixed evidence.

Across all four studies, attitude extremity emerged as a significant predictor of attitude change. However, the pattern of this main effect was not consistent over the course of the studies. In Study 1, the effect of attitude extremity on attitude polarization was in the predicted direction. That is, participants reporting more extreme evaluative positions demonstrated resistance to altering their attitudes after having read the arguments supporting and opposing abortion rights, whereas participants with more moderate initial attitudes became more positive in their attitudes toward abortion rights. Both the resistance to change demonstrated by extreme attitude holders and the openness to change found among those expressing more moderate views initially are in keeping with much of the research surrounding the phenomenon of attitude polarization (e.g., Lord et al., 1979; Miller et al., 1993; Boysen & Vogel, 2007, 2008).

A main effect of attitude extremity was also found in Study 2, but the result pattern differed from that found in the first study. In Study 2, participants who held more extreme initial attitudes toward gun control demonstrated a positive evaluative shift after having read the arguments supporting and opposing the issue, whereas those with more moderate original views became more negative in their attitudes toward gun control. Instead of demonstrating resistance to change as in Study 1, those holding relatively more extreme attitudes about gun control became more evaluatively positive following exposure to mixed evidence. This seemingly inconsistent pattern may reflect that participants were not as familiar with or invested in the issue

of gun control as Study 1 participants were in regards to the issue of abortion rights. Given that the data were collected from a college sample at an urban university, attitudes toward gun control may not have been very salient or the issue may not have been seen as personally relevant. Consistent with this, pretest and posttest attitudes did not correlate in Study 2 ( $r = .01, p > .90$ ), indicating that participants may not have held well-formed, enduring evaluative views on the issue of gun control. The lack of polarization observed among extreme attitude holders in Study 2 may therefore be due, at least in part, to a relative lack of issue salience or interest.

The inclusion of a self-reported attitude change item in Studies 3 and 4 allowed for the comparison of predictive effects for directly assessed and perceived attitude change. Consistent with the first two studies, attitude extremity significantly predicted both conceptualizations of evaluative change in Studies 3 and 4. In Study 3, however, the result pattern differed for difference scores versus self-reported attitude change. Individuals expressing more moderate attitudes toward tax increases tended to remain consistent in their attitudes (i.e., resist change) based on both the actual and self-reported attitude change. Individuals holding more extreme initial attitudes demonstrated and perceived attitude change. Interestingly, however, the direction of attitude change among extreme attitude holders differed for actual versus self-reported change: Whereas those expressing extreme tax increase attitudes actually became more positive in their evaluations from pre- to posttest, these same individuals reported becoming more evaluatively negative. This divergent pattern across conceptualizations of attitude change is consistent with past work by Miller and colleagues (1993), which demonstrated that participants' directly assessed attitude change can differ markedly from their perceptions of their evaluative movement in terms of both valence and magnitude. The divergence between reported and directly assessed attitude change found among those espousing extreme attitudes is not

easily explained. Indeed, no theoretical justification has been offered to explain the discrepancy (e.g., Miller et al., 1993). Potentially, participants were motivated to report evaluative shifts that differed from their true attitude change in the interest of social desirability (as may have been the case in Study 4, wherein essentially no negative change in attitudes toward environmental preservation was reported). It is also possible that the discrepancy was not intentional on the part of participants: Lack of insight into if and how their evaluations of the target issue had changed, as well as differential interpretation of the questions, could also account for the divergent self-report and computed attitude change findings.

In Study 4, a robust main effect for attitude extremity was also found in the prediction of both directly assessed and self-reported change in environmental preservation attitudes. Moreover, this predictive pattern was consistent across both dependent measures. Participants espousing more extreme attitudes toward environmental preservation demonstrated a negative evaluative shift from pre- to posttest, whereas those expressing more moderate initial attitudes became more positive. Similarly, participants with extreme attitudes perceived that they had not become as positive toward the target issue as had moderate attitude holders. The robustness of this main effect in terms of predicting environmental preservation attitude difference scores, as well as its consistent predictive pattern across both directly assessed and self-reported attitude change may speak to the passion and conviction with which attitudes on this particular issue were held. Participants in Study 4 may have been relatively more aware of their attitudes toward the issue of environmental preservation or less inclined to misrepresent their self-reported attitude change than were participants evaluating tax increases in Study 3, which could explain why the same general extremity effect was found across self-reported and computed attitude change measures.

Across all four studies, the extremity of initial attitudes toward the target issue reliably predicted attitude change, whether operationalized as computed difference scores or as self-reported evaluative movement. The predictive pattern found for attitude extremity was not consistent across the four studies, however. Some of the inconsistency may be due to inherent differences in the specific target issues included in the studies. Abortion rights, gun control, tax increases, and environmental preservation represent very different types of social, economic, and political issues that may have spoken to certain participants to varying degrees and for varied reasons. The issues also likely differed in terms of their salience and relevance to a college sample, which may in turn have affected the conviction with which participants espoused their initial attitudes as well as adhered to them in the face of mixed evidence.

**Political ideology.** The second general hypothesis tested in the current studies related to the effect of political ideology on propensities to polarize. Decades of work examining ideological differences in cognitive processing, tolerance for ambiguity, and openness to novel and alternative viewpoints has shown that political conservatives are relatively more close-minded and resistant to change than are political liberals (e.g., Jost et al., 2003a, 2003b; Frenkel-Brunswik, 1949; Adorno et al., 1950; Altemeyer, 1981). Based on this general pattern, it was hypothesized that conservatives would show more polarization of their attitudes in response to the persuasive essays than would political liberals, whose relative open-mindedness and tolerance of ambiguity was expected to give rise to more depolarization.

However, political ideology did not emerge as a significant predictor of attitude change in any of the four current studies. The choice of target issue may help to explain this lack of a predictive effect of political ideology in the first three studies. In Study 1, the distribution of pretest abortion rights attitudes was highly negatively skewed, indicating that participants were

generally highly positive about the issue of abortion rights. It seems that individuals in this college sample held relatively positive attitudes toward the target issue, regardless of their political ideology. The lack of a political ideology main effect in Study 2 may be due to the lack of clear and consistent evaluative positions on what was likely seen as a less personally relevant issue: gun control. Again, the weak correlation between pre- and posttest gun control attitudes may indicate that participants did not know or care very much about the issue of gun control or their attitudes toward it, making changes in those attitudes difficult to predict. In Study 3, the prominence of the target issue – tax increases – in the national media during data collection may have led individuals to rely primarily upon their pre-existing (and likely salient) attitudes about tax increases in determining their evaluative reactions to the mixed evidence. The salience of pre-existing evaluative positions and the topic itself may have meant that participants were relatively less inclined to use their ideological orientation as a guide in reporting their attitudes toward tax increases.

In Study 4, no overall main effect for political ideology was found. Interestingly, although political ideology did not predict directly assessed or self-reported environmental preservation attitude change among MTurk participants, ideology significantly predicted both actual and perceived attitude change among participants in the SONA (i.e., college) subsample, such that conservative SONA participants demonstrated more negative attitude change than their liberal counterparts in terms of difference scores but reported that they had become more positive than any other combination of ideology and participant type in the overall sample. It would appear that conservative participants in the SONA subsample not only demonstrated more actual change in their attitudes toward environmental preservation than the rest of the participants but also were relatively inconsistent in reporting the magnitude and direction of that evaluative shift.

In all four studies, the samples were not skewed or restricted in regards to political ideology, making it highly unlikely that the lack of political ideology main effect could be accounted for by a lack of ideological variability. Given that three of the four studies employed college samples exclusively, it is possible that political ideology did not influence participants' evaluations of the target issues as much as the issues themselves. Work examining political socialization and the development of ideological identity suggests that determining one's political orientation may be less of a priority during the college years than other features of identity, such as occupational leanings and interpersonal exploration (Pastorino, Dunham, Kidwell, Bacho, & Lamborn, 1997). In addition, participants in the SONA samples were primarily college freshmen, a significant number of whom likely had not yet had the opportunity to vote – a key experience in the formation and expression of one's political identity (e.g., Roker, Player, & Coleman, 1999). Moreover, studies examining the extremity of political attitudes have found a strong and reliable association between attitude extremity and issue importance but essentially no link between political attitudes and partisan identification in the general electorate (Liu & Latané, 1997). Given this lack of connection between political ideology and specific issue attitudes, particularly among college students, it seems likely that participants in the current studies brought other factors to bear when adjusting their evaluative positions. Participants may have weighted other features, such as the specific target issue and the extremity of initial attitudes, more heavily than political ideology in determining if and how to change their attitudes.

**Extremity X ideology.** The third hypothesized effect in the current studies was an interaction between attitude extremity and political ideology. That is, the extent to which attitude extremity gave rise to subsequent attitude polarization following exposure to a mix of



supporting and opposing statements was predicted to differ for liberals versus conservatives. Political conservatives were expected to show evidence of attitude polarization, regardless of the extremity of their initial attitudes. Based on characterizations of the conservative “profile” as relatively intolerant, close-minded, and resistant to change (e.g., Jost et al., 2003a, 2003b), attitude polarization was expected to be observed among conservatives with moderate initial attitudes as well as among conservatives holding extreme initial attitudes. Among liberals, however, the degree of attitude polarization was predicted to depend upon the extremity of initial attitudes. As liberalism is generally associated with relative openness, tolerance, and preference for change (e.g., Jost et al., 2003a, 2003b), it was predicted that attitude extremity would be more predictive of attitude polarization. Liberals holding extreme attitudes at the outset were expected to show evidence of polarization, whereas liberals with more moderate attitudes toward the target issues were expected to be relatively open to depolarizing their opinions in response to the presentation of mixed evidence.

The interactive effect of attitude extremity and political ideology on attitude change did emerge in the current studies. However, the specific pattern of the interaction proved inconsistent across the studies and was generally not in line with that hypothesized. In fact, in three of the four studies, the opposite pattern was found. That is, evaluative movement was found among political conservatives, whereas evidence of change resistance emerged among political liberals.

In Study 1, the interaction between attitude extremity and political ideology emerged, but not in the predicted direction and only for men. Specifically, attitude extremity did not predict change scores for liberal men, but for conservative men, extreme attitudes were associated with a negative shift in abortion rights attitudes, whereas moderate attitudes predicted a positive shift.

In Study 2, the interaction of attitude extremity and political ideology was again significant in predicting change in gun control attitudes. In this case, attitude extremity did not predict change scores for liberals, who demonstrated resistance to change regardless of the extremity of their initial views on gun control. For conservative individuals, however, attitude extremity significantly predicted gun control difference scores, such that extreme attitudes were associated with little change, whereas moderate attitudes predicted a negative shift. Across the first two studies, attitude change among political liberals was not affected by the extremity of their initial attitudes, whereas evaluative shifts among political conservatives were. Moreover, a consistent pattern of resistance to change was found among conservative individuals with extreme attitudes – evidence of polarization in response to the mixed evidence.

In Study 3, the extremity X ideology interaction significantly predicted self-reported but not directly assessed changes in tax increase attitudes. Specifically, only one subgroup of participants in Study 3 reported changing their attitudes toward the target issue in either direction: conservative individuals who espoused extreme attitudes about the issue at the outset of the study. These participants reported that their attitudes toward tax increases had become more negative following the presentation of the mixed evidence essay. Given the prominence of the issue of tax increases in mainstream political discourse, as well as the general stance among political conservatives that tax increases would further jeopardize an already faltering national economy, it is likely that the extreme attitudes expressed by some conservative participants were evaluatively negative. Indeed, a significant negative correlation between pretest attitudes and political ideology confirmed that conservatives' initial attitudes toward tax increases were significantly more negative than were liberals',  $r = -.26, p < .01$ . The perception of becoming even more evaluatively negative toward tax increases following exposure to mixed evidence

about the issue would seem to indicate that attitude polarization occurred among conservatives with extreme initial attitudes.

In Study 4, the extremity X ideology interaction significantly predicted directly assessed changes in attitudes toward environmental preservation. Specifically, the effect of attitude extremity on difference scores (such that those with moderate initial attitudes became more positive and those with extreme attitudes became more negative) was more pronounced among liberal participants than among their more conservative counterparts. It could be that the general openness associated with a politically liberal orientation (e.g., Jost et al., 2003a) manifested as a more magnified difference between extreme and moderate attitude holders than that found among more conservative participants in Study 4. In essence, liberal individuals' relative openness may have led them to shift their environmental preservation attitudes in either a negative (if extreme initial attitudes) or positive (if initially moderate) direction to a greater extent than their conservative counterparts. In contrast to the predictive pattern found for directly assessed attitude change scores, the interaction of attitude extremity and political ideology did not significantly predict self-reported change in attitudes toward environmental preservation.

At first blush, it may seem difficult to find a consistent pattern or theme in terms of the interactive effect of attitude extremity and political ideology on attitude change. It is interesting to note that, in the three studies employing college samples exclusively, the effects of extremity were found among conservatives. Perhaps this interactive effect speaks to a discrepancy between the specific issue attitudes and general political identification of conservatives in the college samples. As previous work surrounding the development of political identity indicates (e.g., Pastorino et al., 1997), college-aged individuals are unlikely to have a fully crystallized

sense of their political identity. Moreover, political ideology and attitudes on specific issues can be essentially unrelated to one another (e.g., Liu & Latané, 1997). From this, it seems entirely feasible that a college student could report being politically conservative and yet express issue attitudes that do not align with the “conservative view” on that particular issue. In essence, the college years are a time of transition and development – and ideological orientation may be slower to formulate than other aspects of identity (e.g., Pastorino et al., 1997). The lack of a cogent political identity among college students could help to explain counterintuitive patterns such as the positive evaluative shift seen among conservative participants with moderate gun control attitudes in Study 2. A lack of familiarity with the information presented in the persuasive arguments, particularly among conservative participants, may have contributed to this unexpected pattern as well.

The inclusion of the large non-college sample in Study 4 could potentially help to explain why the extremity X ideology interaction pattern fits more closely with original expectations regarding the differences between liberals and conservatives in terms of attitude change. Perhaps liberal individuals’ relative openness led them to shift their environmental preservation attitudes in either a negative (if extreme initial attitudes) or positive (if initially moderate) direction to a greater extent than their conservative counterparts. This pattern of relative openness to change among liberals was largely absent in the studies conducted using strictly college samples. It could be that the inclusion of non-college participants, whose sense of political identity was likely better established, drove this interactive pattern in the fourth study. The “liberal profile” of openness may more appropriately characterize MTurk participants, who not only reported being liberal but also expressed that openness in considering the issue arguments and changing their issue attitudes.

In addition to these possible explanations for the inconsistent predictive pattern of the extremity X ideology interaction across studies, it is also possible that the original hypothesis was not correct. The hypothesized pattern of polarization among conservatives and liberals with extreme attitudes yet depolarization among liberals with moderate attitudes was drawn from empirical work espousing the “rigidity of the ideological right.” As noted, this is not the only interpretation of findings in the political ideology literature; indeed, many have argued that change resistance and intolerance are equally characteristic of both ends of the ideological spectrum (e.g., Shils, 1954; Rokeach, 1960; Greenberg & Jonas, 2003). That the hypothesized pattern did not emerge could lend credence to the view espoused by these and other researchers who have argued that leftists and rightists (particularly at the extremes) may have more in common than originally assumed.

**Biased assimilation as mediator.** In addition to the three primary hypotheses, two mediation models were proposed and tested in an effort to understand the underlying mechanisms at work in the relations among attitude extremity, political ideology, and attitude polarization. First, biased assimilation was proposed to mediate the relation between attitude extremity and subsequent attitude change. Studies of the attitude polarization phenomenon have repeatedly indicated that extremity-polarization link is driven, at least in part, by the biased assimilation of mixed persuasive evidence (e.g., Lord et al., 1979; Miller et al., 1993). Specifically, research has shown that individuals holding extreme attitudes about a target issue do not process subsequent information in a balanced manner. Rather, the vividness of that extreme initial attitude colors the processing of even a seemingly balanced mix of supporting and opposing statements, such that the extreme attitude holder comes away from the mixed evidence even more confident of the correctness of their original view and the faultiness of the opposing

view. It is this biased assimilation of new information that strengthens the pre-existing attitude and, in so doing, gives rise to attitude polarization.

In keeping with the pattern found in previous empirical investigations, it was therefore hypothesized in Studies 2 through 4 that biased processing would at least partially mediate the extremity-polarization relation. That is, individuals holding extreme attitudes were expected to engage in more biased assimilation and processing of the mixed evidence than those holding moderate initial attitudes, and this discrepancy in processing, in turn, was expected to manifest as greater attitude polarization among extreme attitude-holders versus moderates. This mediating effect did not emerge, however. Although attitude extremity predicted attitude change in all three studies, extremity did not consistently predict accuracy, and accuracy emerged as a significant predictor of attitude change in Study 2 only. Ultimately, no evidence of a mediating effect of accuracy was found in Studies 2, 3, or 4.

As with many of the constructs involved in the current investigation, biased assimilation can be – and has been – operationalized in many different ways. In the current studies, accuracy of participants' thought listings was used as a gauge of the degree to which individuals processed the information provided in the mixed evidence essays in an impartial versus biased manner. The lack of mediation in any of the studies could be due to the operationalization of biased assimilation as simply the accuracy of information recalled. Another way to code the data in the future would be to assess the balance of thought listings supporting versus opposing the issue at hand. The content of all thought listings for each participant could be examined and coded in terms of which side of the mixed evidence essay the content came from, and a ratio of the number of "anti" statements to the number of "pro" statements could be computed. This ratio would provide a sense of whether participants were recalling information from both sides equally

(i.e., more accurate) or if their recall of information leaned more to one side or the other (i.e., more biased). Thus, future investigations will examine if meaningful differences exist in the ratio of supporting to opposing evidence mentioned in participants' thought listings, and whether or not these differences explain the relation between attitude extremity and subsequent attitude change or resistance.

**Mental rigidity as mediator.** The second mediation hypothesis put forward in the current studies sought to explain the connection between political ideology and propensities to polarize. Past work in the political ideology literature has indicated that political conservatives demonstrate less cognitive flexibility (Jost et al., 2003a) and greater need for cognitive closure (e.g., Webster & Kruglanski, 1994; Jost et al., 2003a) than do political liberals and that this difference in mental rigidity accounts for greater resistance to change among conservatives. However, no direct relation was found between political ideology and either directly assessed or self-reported attitude change scores in Studies 3 or 4, and mental rigidity (although correlated with political ideology) did not significantly predict computed or perceived attitude change. Therefore, mental rigidity did not emerge as a significant mediator in the relation between political ideology and changes in attitudes toward tax increases or environmental preservation.

### **Individual Difference Factors**

In addition to the primary variables of interest (i.e., attitude extremity, political ideology, attitude change), measures of individual differences were incorporated and explored to see if they directly or interactively contributed to the prediction of attitude change. Several of these individual difference variables, particularly those related to motivation, were found to moderate the primary hypothesized effects throughout the four studies.

In Study 1, gender moderated the interactive effect of extremity and ideology on changes in attitudes toward abortion rights, such that extremity alone predicted women's attitude change but both extremity and ideology affected men's evaluative shift. In Study 2, individual differences in need for cognition both directly and interactively predicted changes in gun control attitudes. Participants who more routinely were motivated to put forth cognitive effort (i.e.,  $NFC_{high}$ ) tended to become more evaluatively positive than those who were lower in need for cognition. In addition, individual differences in need for cognition further qualified the interaction between attitude extremity and political ideology.

Although accuracy of participants' thought listings did not emerge as a mediator in the current studies, it was found to significantly predict gun control attitude difference scores (more accurate thought listings were associated with positive change; less accurate responses related to change resistance) as well as moderate the relation between extremity of initial attitudes toward gun control and subsequent attitude change in Study 2. Individual differences related to the importance placed on the specific issue of environmental preservation predicted actual and perceived attitude change in Study 4. A main effect of importance of environmental preservation was found, with those viewing the issue as relatively more important resisting change and those for whom environmental preservation was seen as less important demonstrating negative change. Moreover, importance placed upon the issue of environmental preservation was also found to interact with both attitude extremity and political ideology in predicting directly assessed and self-reported attitude change.

Across the four studies, various individual difference factors either directly influenced attitude change or interacted with one or more other variables. To some extent, these factors may provide some gauge of the personal relevance of the specific target issue. For instance, that



different predictive patterns were found for men versus women in Study 1 may indicate that men viewed the issue of abortion rights as less personally relevant than did women. The differences in general cognitive processing and accuracy of recall that emerged as predictors in Study 2 could speak to the overall lack of knowledge about or interest in the topic of gun control. Finally, a direct assessment of issue importance significantly predicted attitude change in Study 4. If the commonality among the effects of individual difference factors in the current studies is their relation to issue importance, it is not surprising that they should influence the result patterns obtained. Of note, however, none of the individual difference effects emerged in more than one study. Nearly all of these factors (with the exception of issue importance) were assessed in multiple studies, and yet no one variable was found to predict attitude change consistently. Although individual differences clearly affected the results of the current studies, the lack of a robust and reliable predictive effect for any one measure suggests that other factors (e.g., attitude extremity) were more influential in terms of predicting attitude change.

### **Limitations**

It is important to acknowledge that the current studies were limited in some ways. First, there was heavy reliance on college samples in these studies. Although many individual differences were assessed and controlled for, these samples may differ from the broader population in several ways, including age, education level, racial/ethnic composition, and issue awareness. The inclusion of a non-college sample in Study 4 provided some assurance that the obtained findings were generalizable beyond college students; however, the subsamples were found to differ in terms of need for cognition, cognitive flexibility, and recall accuracy. Moreover, several interactive patterns emerged differently in the MTurk sample compared to the SONA sample. There is also some question as to the structure and function of political ideology

in informing the issue attitudes of college students. That political ideology failed to emerge as a significant predictor of attitude change in most instances, despite the presence of good variability on the composite ideology measure, would seem to suggest some degree of disconnect between ideological identification and evaluative position on specific target issues.

A further limitation in the current studies was that issue importance was assessed only in the fourth and final study. Although a general measure assessing the importance placed upon politics was employed in Studies 1 through 3, it did not directly or interactively predict attitude change. In contrast, the inclusion of an item assessing how important participants felt the specific issue of environmental preservation was emerged as a robust predictor of both perceived evaluative change and computed difference scores in Study 4, as well as moderating the effects of attitude extremity and political ideology on the dependent measures of interest. Incorporating an item addressing specific issue importance as opposed to general importance placed on politics would likely have clarified and extended the findings of the earlier studies as well.

Another issue that arose in the current studies was one of data non-normality. The distributions of several measures employed in the current studies were found to be highly skewed. Issues of non-normality were addressed by transforming the data prior to analysis; however, transformation poses some challenges for interpretation. Some of the non-normal distributions obtained in the current studies were likely representative of patterns found in the larger population (e.g., attitudes toward abortion rights and environmental preservation); others, however, may indicate patterns particular to these specific samples (e.g., recall accuracy, issue importance). In addition to non-normal distributions of several variables, an imbalance in the representation of men versus women existed in Studies 1 and 4, with women comprising over two-thirds of the sample in both cases. It is possible that the composition of these samples

influenced the result patterns obtained, particularly in Study 1 (the target issue for which was abortion rights). Given the presence of such a gender imbalance in these samples, it is difficult to generalize the findings to an entire population.

Beyond the inclusion or omission of variables and the specific distribution patterns of various factors, a broader issue to note is the potential for alternative or additional conceptualizations of the variables themselves. As outlined in the first chapter, many of the factors of primary interest in the current studies have been operationalized in different ways throughout the literature, including attitude extremity, conservatism, biased assimilation, and attitude polarization. In the current studies, every attempt was made to a) base decisions regarding operational definitions on past work and theory and to b) explicitly state and thoroughly explain how such concepts were defined and measured. It is certainly conceivable that alternative definitions and measures of many variables could be employed and would likely give rise to some amount of divergent result patterns – indeed, the use of markedly different measures to assess the “same” phenomenon has likely contributed to the confusion and controversy found in both the attitude polarization and political ideology literatures.

### **Future Directions**

The current studies represent an important step in delineating the relations among attitude extremity, political ideology, and the degree and direction of evaluative change following exposure to mixed evidence. From here, many additional avenues of research related to this topic could be explored that would build upon the current findings. It would be very interesting to examine if and how the patterns observed here might change if different target issues were provided (e.g., censorship, armed conflict, separation of church and state, etc.). In addition to assessing attitudes toward the target issue itself, future studies could also measure participants’

evaluative reactions to the specific arguments presented in the issue essay. In particular, items assessing perceptions of argument persuasiveness, familiarity, and novelty would provide valuable insight into the processing of the mixed evidence. The incorporation of large non-college samples, as in Study 4, would allow for the examination of these result patterns outside of a college population. Another interesting group to incorporate would be political elites: party leaders, policy “wonks,” and others well-versed in specific issues as well as relatively more aware of and steeped in their ideological identity. Such a politically knowledgeable sample might display a greater match between issue attitudes and political ideology than that found in the college samples employed in the current studies.

Alternative or additional conceptualizations of the variables of interest could also extend and clarify the findings obtained in the current studies. For instance, response options for attitude measures could be expanded to provide more evaluative options for participants and greater variability for analysis. The “cut-off” points for classifying as attitudes as relatively more or less extreme could be moved; individuals rating their pretest attitudes as “neutral” could be excluded from analyses. In terms of assessing polarization, it would be interesting to incorporate a “trinary index” as a third dependent measure (as in Miller et al., 1993) in addition to directly computed difference scores and self-reported change. Different or broader coding dimensions could provide rich information not only on the accuracy of participants’ information recall but also on their self-generated impressions of the issue and the arguments presented, as well as the extent to which they spontaneously provide additional information not found in the mixed evidence arguments. Further examination of participants’ qualitative data would surely enrich and clarify findings related to how information is perceived and processed – it would be

interesting to compare the essays of those espousing extreme versus moderate views to see if and how they differed.

The scope and generalizability of the current studies' findings could be broadened by examining the role of other individual difference factors in qualifying the relations of primary interest. It would be very interesting to see if and how differences in ideological extremity, general political knowledge, familiarity with a specific issue, and general desire to evaluate a target could modify the patterns found in the current studies. The external validity of the results found in the current studies could also be addressed by conducting subsequent empirical examinations in more real-world contexts. For example, would attitudinal responses to mixed evidence look similar or different if that evidence was presented via political campaign ads or congressional hearings? Finally, it would be very interesting to examine the downstream effects and behavioral outcomes of attitude change and polarization, similar to Miller et al.'s (1993) procedure. Future work could employ longitudinal designs to assess the duration of various effects on attitude change. Subsequent studies could also assess if and how extreme versus moderate attitude holders, or political liberals versus conservatives, differed in terms of discussing the issues after having read about them. It would also be interesting to examine whether attitude extremity or political ideology affect participants' selective exposure to subsequent issue information. Such extensions could build upon and broaden the findings of the current studies in important and interesting ways.

## **Conclusion**

In sum, the current studies integrated work in both the attitude polarization and political ideology traditions in an effort to better understand the role of attitude extremity and political ideology in effecting evaluative change versus resistance. In addition to examining the relations

among extremity, ideology, and polarization following mixed evidence, this series of studies extended and clarified these associations by incorporating a variety of target issues, individual difference factors, and samples. Taken together, these studies provide evidence that attitude extremity and political ideology influence the degree and direction of evaluative change following the presentation of mixed evidence. In addition, they highlight the varied and nuanced ways in which initial attitudes, political identification, and an array of personal and issue-specific factors combine to inform and influence our political attitudes.

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## List of References

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## Appendix A

### Pretest Attitudes Measure

Please indicate your opinion about each social issue using the following scale:

-3	-2	-1	0	1	2	3
Extremely Negative						Extremely Positive

- 1) Gun control
- 2) Censorship of media (e.g., television, movies, etc.)
- 3) Environmental preservation
- 4) Pornography
- 5) Social security
- 6) Tax increases
- 7) Social networking sites (e.g., Facebook, MySpace, etc.)
- 8) Health care reform
- 9) Abortion rights
- 10) Welfare system

## **Appendix B**

### **Social Networking Sites Essay**

Social networking sites are a good way to make connections with people with similar interests and goals and to meet people that you may not have had the opportunity to meet before. There are more than 350 million active users on Facebook.com, and about 70% of Facebook users are outside the U.S. This shows that there is no better way to share ideas/values and create relationships. Making friends is easy, so meeting people and staying connected with classmates and friends is a major benefit of social networking sites. Social networking sites offer campus surveys, "party" or event listings, and other information that communicates the "pulse" of a campus culture. These sites can be a great way to understand and stay connected to your campus community as a whole. An additional benefit of social networking sites is that you can stay in touch or reconnect with old friends, even those you might not have been able to communicate with otherwise. Most importantly, social networking sites offer students the opportunity to create a positive self-image. The profiles give students a chance to create the image of themselves that they want people to see by putting their best qualities "out there."

On the negative side, social networking sites can be detrimental and even dangerous. For instance, students are getting in trouble with university administrators for incriminating and inappropriate information or pictures on their social networking profiles that are violations of school policy or code of conduct. Students are being turned down by employers for jobs, internships, and even interviews because of the information employers are finding out about students on their social networking accounts. Recent research by an American university found that 23 percent of employers reviewed candidates' profiles on social networking sites. Compromising and inappropriate pictures, statements, or other information on student social networking accounts can hurt students' chances of gaining (or even being considered for) employment. Employers take the images that students are portraying on social networking sites very seriously as a reflection of personal character. In addition to hurting one's employment chances, social networking sites can also be dangerous. Many people provide detailed personal information, including contact information and addresses, on their sites. Cyber criminals and others with bad intentions can easily learn a lot about you, leaving you vulnerable to harassment, threats, or even attack.



## **Appendix C**

### **Abortion Rights Essay**

Those who oppose abortion rights say that the unborn child has a fundamental individual right to life which cannot be undermined. They support a human life amendment to the constitution and endorse legislation to make it clear that the 14th Amendment's protections apply to unborn children. Their purpose is to have legislative and judicial protection of that right against those who perform abortions. They oppose using public revenues for abortion and refuse to fund organizations which advocate it. They support the appointment of judges who respect traditional family values and the sanctity of innocent human life.

On the other hand, individuals who support abortion rights believe in the privacy and equality of women and stand proudly for a woman's right to choose, consistent with *Roe v. Wade*, and regardless of her ability to pay. They stand firmly against efforts to undermine that right. At the same time, they strongly support family planning and adoption incentives. Abortion should be safe, legal, and rare. Those who support abortion rights stand behind the right of every woman to choose, which they believe it is a constitutional liberty. Their goal is to make abortion more rare, not more dangerous. They support contraceptive research, family planning, comprehensive family life education, and policies that support healthy childbearing.

## Appendix D

### Political Ideology Measure

Please read each of the followings statements carefully. Indicate the extent to which you agree or disagree with each statement using the scale below. Please think carefully before answering.

- +2 Agree strongly
- +1 Agree somewhat
- 0 Neither agree nor disagree, or no opinion
- 1 Disagree somewhat
- 2 Disagree strongly

- 1) Congress should not increase taxes, rather they should decrease spending.
- 2) More support for AIDS research is needed.
- 3) Abortion is wrong, because everyone, even unborn babies, has the right to life.
- 4) The government should adopt a stricter immigration policy.
- 5) It is easy to understand the anger of Black people in America.
- 6) The benefits of nuclear power plants outweigh its potential hazards.
- 7) Sex education should be taught at home by the parents, not in public schools.
- 8) The government should spend less on defense and focus more on domestic needs.
- 9) Discrimination against Blacks is no longer a problem in the U.S.
- 10) Homosexuals should not legally be allowed to marry.
- 11) If drugs were decriminalized, society would degenerate.
- 12) Some crimes are so despicable, they should be punishable by death.
- 13) Over the past few years, Blacks have gotten more economically than they deserve.
- 14) Evolutionary theory should not be taught in public schools.
- 15) Abortion should be illegal.

- 16) Gay people are entitled to the same constitutional rights as heterosexuals.
- 17) Homelessness has become an issue that requires immediate attention by the federal government.
- 18) The government should not adopt a stricter policy to protect the environment.
- 19) Because the U.S. is a world leader, it cannot cut its defense spending position without losing its world position.
- 20) Terminal patients should not have the right to die.
- 21) It is women's constitutional right to choose whether or not to have an abortion.
- 22) There should not be a complete separation between church and state.
- 23) Blacks have more influence upon school desegregation than they ought to have.
- 24) Environmentalists should worry less about the welfare of animals and more about people's jobs.
- 25) An increase in taxes is needed.
- 26) Marijuana should not be legalized for medicinal use.
- 27) Capital punishment is not an effective deterrent.
- 28) The government should restrict stem cell research.
- 29) Over the past few years, the government and news media have shown more respect to Blacks than they deserve.
- 30) For safety reasons, all existing nuclear power plants should be shut down.
- 31) The United States did the right thing by attacking Iraq.
- 32) Too much money is being spent on AIDS research and not enough is being spent on research for other serious diseases.
- 33) Censorship of music and art violates people's constitutional rights.
- 34) The death penalty should not be abolished.
- 35) Blacks are getting too demanding in their push for equal rights.

- 36) Sex education in schools is vital, especially with the increasing concern of AIDS.
- 37) Gun control violates people's constitutional right to bear arms.
- 38) The government should not adopt a policy to guarantee health care to all workers and their families.
- 39) Blacks should not push themselves where they are not wanted.
- 40) Student-led prayer should be allowed in public schools.
- 41) The minimum wage should not be raised.
- 42) Quotas should be set so that more women are hired for traditionally male-dominated jobs.
- 43) The current pre-emptive (strike them before they strike you) foreign policy, is the most effective foreign policy.
- 44) Censorship of art is justified when the artwork is deemed pornographic or obscene.

How would you rate yourself on the following scale?

- a) As conservative as it gets
- b) Very conservative
- c) Moderately conservative
- d) Slightly conservative
- e) Neither one nor the other
- f) Slightly liberal
- g) Moderately liberal
- h) Very liberal
- i) As liberal as it gets

## Appendix E

### Importance of Politics Questionnaire

1) How important are political figures, issues, and events to you?

Not important      -3      -2      -1      0      1      2      3      Very important

2) How often do you read about political figures, issues, and events?

0                      1                      2                      3                      4  
Never              Rarely              Occasionally              Frequently              Constantly

3) How often do you watch media coverage of political figures, issues, and events?

0                      1                      2                      3                      4  
Never              Rarely              Occasionally              Frequently              Constantly

4) How often do you engage in discussions of political figures, issues, and events?

0                      1                      2                      3                      4  
Never              Rarely              Occasionally              Frequently              Constantly

5) My political beliefs are an important part of who I am.

Strongly disagree      -3      -2      -1      0      1      2      3      Strongly agree

6) Political events directly affect the “average” person.

Strongly disagree      -3      -2      -1      0      1      2      3      Strongly agree

7) Do you participate in politics?

Yes                      No

8) Are you registered to vote?

Yes                      No

9) Did you vote in the 2008 presidential election?

Yes                      No

10) Please put an “X” next to the political activity(-ies) in which you have taken part:

voted     contacted a political figure  
 volunteered/helped with a campaign       ran for political office  
 donated to a political party or organization       held political office  
 participated in a rally, march, or demonstration  
 other (please describe): \_\_\_\_\_

11) Voting is an important way that citizens can influence the political process.

Strongly disagree      -3      -2      -1      0      1      2      3      Strongly agree

## Appendix F

### Demographics Questionnaire

Gender (circle): Male                      Female

Marital Status (check one):

- Single
- Married
- Separated
- Divorced
- Widowed

Ethnicity (check one):

- White/Caucasian
- Hispanic/Latino(a)
- African-American/Black
- Asian
- Native American
- Other – Please list: \_\_\_\_\_

What is your religious affiliation (check one):

- |   |   |
|---|---|
| <input type="checkbox"/> Christian – Protestant | <input type="checkbox"/> Muslim                     |
| <input type="checkbox"/> Christian – Catholic   | <input type="checkbox"/> Jewish                     |
| <input type="checkbox"/> Hindu                  | <input type="checkbox"/> Atheist                    |
| <input type="checkbox"/> Buddhist               | <input type="checkbox"/> Agnostic                   |
| <input type="checkbox"/> Not religious          | <input type="checkbox"/> Other – Please list: _____ |

How would you characterize your hometown? (check one)

- rural (unincorporated)
- small town (village or town)
- suburban (metropolitan area of a large city)
- small city (population < 30,000)
- medium-sized city (population 30,000 – 100,000)
- large city (population > 100,000)

## **Appendix G**

### **Gun Control Essay**

Individuals who support gun control argue that federal, state, and local gun crime prosecution has increased by twenty-two percent since 1992, and over that time, crime has decreased by thirty-five percent. Yet, stipulations to gun ownership should be added in order to maintain a safe environment for citizens. It is not the gun that is being questioned, but the hand that pulls the trigger. The United States has the highest rate of gun ownership and of gun homicide in the developed world. Almost eight individuals aged 19 and under are killed each day by a firearm in the United States. Firearms are the second leading cause of death for people 19 years and under. In many neighborhoods, guns are accessible to children, the mentally ill and gang members. Not only will homicide rates continue to decrease, gun control will decrease the rate of suicide as well. Furthermore, mandatory child safety locks are needed. We should also require all individuals to present a photo license I.D., consent to a background check, and complete a gun safety test in order to buy a new handgun. A way to support more federal gun prosecutors is to give states and communities another 10,000 prosecutors to fight gun crime. Stricter gun control laws are the answer.

On the other hand, those who oppose gun control argue that we need to defend the constitutional right to bear arms. Crime was lower when guns were easier to buy before 1968, when you could buy a gun with no paperwork or waiting periods. Federal licensing of law-abiding gun owners and national gun registration is a violation of the second amendment and an invasion of the privacy of honest citizens. There are an estimated 80-100 million gun owners who have not killed anyone. While one law guarantees the right to own guns, another amendment makes it difficult for the common man in a crime-driven neighborhood to purchase a gun. For every police officer, there are 1700 citizens that he or she has to protect. Unfortunately, police cannot protect every individual, just the general public. Law-abiding citizens would be better equipped to handle situations in which they find themselves face to face with criminals if they had freer access to guns. Potential criminals would be scared away from home invasions and other types of wrong-doing by the threat of a gun. Stricter gun control laws are not the answer.

## Appendix H

### Need for Cognition Scale

For each of the statements below, please indicate to what extent the statement is characteristic of you. Please use the following scale:

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

1. \_\_\_\_\_ I would prefer complex to simple problems.
2. \_\_\_\_\_ I like to have the responsibility of handling a situation that requires a lot of thinking.
3. \_\_\_\_\_ Thinking is not my idea of fun.
4. \_\_\_\_\_ I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
5. \_\_\_\_\_ I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
6. \_\_\_\_\_ I find satisfaction in deliberating hard and for long hours.
7. \_\_\_\_\_ I only think as hard as I have to.
8. \_\_\_\_\_ I prefer to think about small, daily projects to long-term ones.
9. \_\_\_\_\_ I like tasks that require little thought once I've learned them.
10. \_\_\_\_\_ The idea of relying on thought to make my way to the top appeals to me.
11. \_\_\_\_\_ I really enjoy a task that involves coming up with new solutions to problems.
12. \_\_\_\_\_ Learning new ways to think doesn't excite me very much.
13. \_\_\_\_\_ I prefer my life to be filled with puzzles that I must solve.
14. \_\_\_\_\_ The notion of thinking abstractly is appealing to me.
15. \_\_\_\_\_ I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. \_\_\_\_\_ I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
17. \_\_\_\_\_ It's enough for me that something gets the job done; I don't care how or why it works.
18. \_\_\_\_\_ I usually end up deliberating about issues even when they do not affect me personally.



## **Appendix I**

### **Tax Increase Essay**

Those who support tax increases argue that increased taxes lead to more money for the maintenance of public property, military defense, enforcement of law and public order, and for welfare and other public services such as education, healthcare, pensions for the elderly, and unemployment. For example, increased spending on the maintenance of public property means better roads, public transportation, and government facilities. Increased taxes would also mean more people being hired to perform the work, which in turn leads to more people having the ability to spend their earnings, thereby putting money back into the economy. Tax increases benefit education as well. Better facilities and teacher salaries means an improved learning environment and happier teachers. This will directly benefit the students, creating a better educated youth that will lead to a more educated workforce which can only help the economy. When taxes were first established, the poor were disproportionately taxed to support the rich, but now taxes allow the government to help support the poor, disabled, and also military veterans. The money from increasing taxes goes back into the services that aid our country's citizens; therefore, a tax increase could only benefit Americans.

On the other hand, those who oppose tax increases argue that a tax increase can only hurt United States citizens further. The "rich" will not be the only ones affected. In fact, the tax increase will hurt Americans at all income levels. A tax increase will eliminate all growth-promoting policies from previous tax relief packages and will lead to slower economic growth. This lack of spending will also cause a lowered standard of living in America. A tax increase will mean fewer jobs and will keep those who would have otherwise found work unemployed. America is already suffering from a high unemployment rate and now would be the least favorable time to discourage citizens from taking part in the behaviors that will help improve the economy and bring it out of its chronic downswing. Small businesses will also take a big hit with the tax increase. These higher tax rates will discourage entrepreneurs and other individuals from wanting to launch new businesses, therefore stifling what could be the next big industry. Tax increases will only injure what is already a suffering economy; therefore, the government should extend tax relief to its citizens as opposed to increasing taxes.

## Appendix J

### Need for Cognitive Closure Scale

For each of the statements below, please indicate to what extent you agree with the statement on a scale from 1 (completely disagree) to 6 (completely agree).

1. I don't like situations that are uncertain.
2. I dislike questions which could be answered in many different ways.
3. I find that a well ordered life with regular hours suits my temperament.
4. I feel uncomfortable when I don't understand the reason why an event occurred in my life.
5. I feel irritated when one person disagrees with what everyone else in a group believes.
6. I don't like to go into a situation without knowing what I can expect from it.
7. When I have made a decision, I feel relieved.
8. When I am confronted with a problem, I'm dying to reach a solution very quickly.
9. I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
10. I don't like to be with people who are capable of unexpected actions.
11. I dislike it when a person's statement could mean many different things.
12. I find that establishing a consistent routine enables me to enjoy life more.
13. I enjoy having a clear and structured mode of life.
14. I do not usually consult many different opinions before forming my own view.
15. I dislike unpredictable situations.

## Appendix K

### Cognitive Flexibility Scale

The following statements deal with your beliefs and feelings about your own behavior. Read each statement and respond by indicating the number that best represents your agreement with each statement.

Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
6	5	4	3	2	1

---

- 1) I can communicate an idea in many different ways.
- 2) I avoid new and unusual situations.
- 3) I feel like I never get to make decisions.
- 4) I can find workable solutions to seemingly unsolvable problems.
- 5) I seldom have choices when deciding how to behave.
- 6) I am willing to work at creative solutions to problems.
- 7) In any given situation, I am able to act appropriately.
- 8) My behavior is a result of conscious decisions that I make.
- 9) I have many possible ways of behaving in any given situation.
- 10) I have difficulty using my knowledge on a given topic in real life situations.
- 11) I am willing to listen and consider alternatives for handling a problem.
- 12) I have the self-confidence necessary to try different ways of behaving.

## **Appendix L**

### **Environmental Preservation Essay**

Some individuals feel that we need to take action to preserve our nation's land. We need to work now to preserve America's untouched landscapes and to protect wildlife for future generations. Our nation's heritage is one of free, open, untouched landscapes – these beautiful areas are increasingly threatened by encroaching development and unchecked expansion. We need to oppose the clearing of old growth forests and the use of public lands as grazing areas for livestock. In addition, mining and drilling cause significant and often irreversible damage to public lands and the ecosystems they support, so we must advocate for more responsible and renewable energy development. In order to protect America's public lands and the wildlife they support, we must act now. By working with scientists, lawyers, and developers, we can ensure that public lands are managed appropriately and that those who violate environmental laws are held accountable. If we do not work together to preserve our nation's landscapes, waterways, and wildlife, we risk losing them altogether.

Other individuals argue that it is imperative that we take action to make use of our nation's land. We need to work now to improve America's troubled economy and to create jobs and homes for future generations. Our nation's heritage is one of seizing opportunity and working to improve conditions instead of simply accepting them. In order to support a growing population with ever increasing needs, our nation must expand its infrastructure and agricultural resources to meet the growing demand. Clearing some public lands will allow us to grow more food, build more roads and residential areas, and even make use of the plentiful energy resources such as coal and natural gas that our country already has. Such expansion projects will mean more jobs for many people who are currently unemployed, which will help individuals weather the economic crisis. In addition, mining and drilling will reduce our nation's dependence on foreign oil as an energy source. If we do not work together to make use of our nation's natural resources, we risk further economic and international instability.

## **Vita**

Jessica Michelle Barber was born on September 29, 1984, in Harrisburg, Pennsylvania. She graduated from Central Dauphin East High School in Harrisburg, Pennsylvania in 2003. Jessica received her Bachelor of Science in Psychology and French from Lebanon Valley College, Annville, Pennsylvania, in 2007. She earned a Master of Science in Psychology from Virginia Commonwealth University in 2009 and has taught several courses at VCU over the past three years. In addition, Jessica is currently completing a yearlong doctoral policy internship with the American Psychological Association's Public Interest Government Relations Office in Washington, DC.