

ON SECOND THOUGHT:  
LOW-EFFORT THOUGHT PROMOTES HIERARCHY VALUES

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## Abstract

Values are associated with political attitudes and political conservatism is promoted with low-effort thought. Does low-effort thought similarly promote the conservative value of hierarchy while reducing the value of equality? Values are conceptualized as stable, yet research suggests that values may be processed with automatic and controlled processes. I examined the automaticity of hierarchy values across four studies. In Study 1, bar patrons with higher blood alcohol levels rated hierarchy values as more important and egalitarian values as less important. In Study 2, participants asked to evaluate values superficially rated hierarchy values as more important and egalitarian values as less important than those asked to deliberate carefully. Study 3 sought to replicate Study 2 adjusting for the influence of affect. Participants asked to evaluate values superficially rated hierarchy values as more important but did not shift in equality values. Study 4 used ego depletion to manipulate cognitive effort while assessing values. Participants' value ratings under ego depletion did not significantly differ from those in the control group. Results of three studies suggest that low-effort thought processing may encourage support for hierarchical values at the expense of egalitarian values.

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## On Second Thought:

### Low-Effort Thought Promotes Hierarchy and Undermines Equality

Schwartz defines a value as “a (1) belief (2) pertaining to desirable end states or modes of conduct, that (3) transcends specific situations, (4) guides selection or evaluation of behavior, people, and events, and (5) is ordered by importance relative to other values to form a system of value priorities” (Schwartz, 1994, p. 20). Schwartz’s theory of values (e.g., Schwartz, 1994; Schwartz et al., 2012) distinguishes ten core types of values that are considered a universal response to challenges that societies must cope with to survive (i.e., needs of individuals as organisms, coordinated social interaction, requirements for the smooth functioning and survival of groups).

Values motivate and underlie attitudes and behaviors, but social norms can suppress the relation between values and behavior (Bardi & Schwartz, 2003). Values differ from attitudes in that they are abstract ideals and standards, where attitudes are evaluations of specific targets (e.g., Maio, Olson, Bernard, & Luke, 2003). The relationship between values and attitudes is strengthened when attitudes serve a value-expressive function, compared to other functions such as utilitarian functions (Maio & Olson, 1995). Values are linked to valence, as are attitudes, such that important values are viewed positively as well (Feather, 1995; Maio et al., 2003). Maio et al. (2003) argued that ideologies, attitudes and values all rely on feelings, beliefs and past behavior, which can stem from direct, personal experience or indirect experience (e.g., institutions, family). Values are influenced to a greater extent by indirect experience, or information from other people (Maio et al., 2003).

As Schwartz (1996) pointed out, attitudes are not guided by a single value, but rather by tradeoffs among values. Values operate as an interdependent system such that the pursuit of

opposing values conflict—as support for a value increases, support for an opposing value decreases (Schwartz, 1994; See Figure 1). For example, the pursuit of power, control and dominance over others would oppose pursuit of universalism, protection for the welfare of all people. If power is rated as highly important, universalism will necessarily be rated as relatively unimportant. The structure of the interdependent system and general hierarchy of values is stable across cultures, but the relative importance of values can vary to a certain extent within and between cultures (e.g., Schwartz & Bardi, 2001). The study of values (and value conflicts) underlying social attitudes can be informed by and simultaneously provide valuable insight into psychological processes behind attitudes and attitude change.

Although values are conceptualized as stable across specific situations, I argue that values may follow a dual-process model of automatic and effortful thought. Values may be relatively stable over long periods of time, but value expression may shift as the result of situational factors. I propose that low-effort thought will promote the conservative value of hierarchy while reducing the opposing value of equality.

### **Dual process models**

Dual process models of attitudes and attitude change may be applicable to understand value shifts because values underlie attitudes and behaviors (e.g. Bardi & Schwartz, 2003; Maio & Olson, 1995). Attitudes can have a value-expressive function, where people tend to like targets that are in line with their personal values and dislike targets that oppose personal values (e.g., Katz, 1960; Maio & Olson, 1995; Maio et al., 2003).

Dual process models of judgment and decision making suggest that people operate with two systems of reasoning. The automatic system uses shortcuts to process information quickly, and the controlled system uses slow, deliberate processing (for a review see Bargh & Ferguson,

2000). Automatic attitudes are well-learned and expressed with low-effort, while explicit, controlled attitudes require greater motivation and cognitive capacity to express (e.g., Evans, 2008). Automatic, or low-effort, thought can conserve energy and ease processing, but can lead to biases in person perception. For example, people can rely on stereotypes strategically to manage and access information under high cognitive load (e.g., Devine, 1989). When people focus on making situational inferences it can be more effortful to take dispositional information into account (Krull & Erickson, 1995). Under-processing is not the only source of bias, however, as high-effort, controlled processing can lead people to under-value intuitions (e.g., body language as a lie detection cue versus linguistic cues) when making judgments of others (Gilbert & Krull, 1988).

Automatic and effortful models of attitudes also have implications for persuasion and attitude change. Both the Heuristic-Systemic Model of Information Processing (HSM; e.g., Chaiken, 1980) and the Elaboration-Likelihood Model (ELM; Petty & Cacioppo, 1986) suggest that attitude change can occur at the level of systemic, central processing or at the level of heuristic, peripheral processing. Both models posit that effortful, systemic processing is likely to result in stable, long-lasting attitude change, while peripheral routes are unstable and temporary.

Manifestations of dual-processes are generally held in consensus across theories, but the mechanisms underlying dual-process attitudes remain contested (for review see Evans, 2008; Payne & Gawronski, 2010). Mechanisms have been attributed to dual memory systems (Greenwald & Banaji, 1995; Smith & DeCoster, 2000), validation of associations or affective reactions (e.g. Gawronski & Bodenhausen, 2006; Strack & Deutsch 2004), intelligence (e.g., Stanovich, 1999), and abstract and concrete processing (e.g., Evans, 2006), among other mechanisms. It is beyond the scope of the current studies to speak to the suggested mechanisms

of dual-processes models. I simply investigate whether values operate in a pattern consistent with automatic and controlled processing. Dual-process accounts of attitudes may help explain variations in values under different levels of thought processing since values are abstract standards that underlie attitudes (e.g., Bardi & Schwartz, 2003).

### **Are values situationally stable?**

Values are conceptualized as stable across situations and across time (Feather, 1971; Rokeach, 1973; Schwartz, 1997) and are relatively stable during adulthood (Bardi, Lee, Hofmann-Towfigh, & Soutar, 2009), but values can shift in importance. Changes in values can occur as the result of value conflicts in life changes (Bardi et al., 2009) and these values shifts predict change in related beliefs across time (Goodwin, Polek, & Bardi, 2012). When values do change, they maintain an interdependent structure—as support for a value increases, opposing values tend to decrease (Bardi et al., 2009; Maio, Pakizeh, Cheung, & Rees, 2009). Priming a particular value not only increases related behavior, but also decreases opposing behavior (Maio et al., 2009).

Values can change as the results of experimental manipulation through self-confrontation—a method of value change which primes self-dissatisfaction with held values that are counter to expectations of competence or morality (e.g., Grube, Mayton, & Ball-Rokeach, 1994; Rokeach, 1975). Self-confrontation was used on a mass scale in The Great American Values Test (Ball-Rokeach, Rokeach, & Grube, 1984). Ball-Rokeach and colleagues created a television program that prompted viewers to compare their own values with the values of other Americans. Their pretest-posttest analysis demonstrated that viewers who watched the entire program valued freedom and equality more, evaluated black people and women more positively, and were more likely to contribute to pro-environment, antisexist, and antiracist solicitations—

even weeks after the program appeared. Rokeach and Grube (1979) have argued, however, that self-confrontation is unlikely to shift values arbitrarily as people are selective in the direction of value change they will accept. Self-confrontation is only effective to the extent that individuals perceive that they are not conforming to the standards of an important social group.

Values have also been experimentally manipulated through priming. For example, people performed better on word puzzles after they read an article about achievement (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001) and weighted environmental factors more in a consumer choice after forming an impression of a person who adhered to environmental values (Verplanken & Holland, 2002). Values have also been primed through sentence unscrambling tasks, weighted questionnaires (e.g., only questions related to self-transcendent or self-enhancement values), and speeches focusing on Protestant Work Ethic or egalitarian values (Biernat, Vescio, & Theno, 1996; Roccas, 2003; Verplanken & Holland, 2002). Priming and self-confrontation methods suggest that values may be more malleable and situationally dependent than previously theorized.

Bardi and Goodwin (2011) suggested that there are automatic and effortful routes to value change, as with attitude change (e.g., Chaiken, 1980; Petty & Cacioppo, 1986). Values are central to self-concept (Brewer & Roccas, 2001) and people tend to readily, consciously identify and remember values when needed (Schwartz & Bilsky, 1987). There is also an unconscious component to values such that people behave in accordance with their values without conscious awareness (Bardi & Schwartz, 2003; Schwartz, 1996). The automatic route to values can be primed and this strengthens the links of schemas that include the primed value (Bardi & Goodwin, 2011). In contrast, the effortful route to initial value change can begin with environmental cues that cause people to challenge, re-evaluate, and potentially change values.

The limited research on value change has focused on manipulating value salience through self-confrontation and priming. The current work seeks to examine how value orientation may differ as a function of situational cues unrelated to values—specifically values under different levels of thought processing. People may be less likely to consider social norms in their responses when controlled processing is inhibited, but instead rely on values that come quickly and easily. Some values may be relatively dominant compared to others in that they follow from low-effort, automatic thought processing. Specifically, values related to hierarchy may be favored with low-effort thought compared to controlled, deliberative processing

### **Values and Political Attitudes**

Values underlie attitudes and can be expressed via political attitudes (Feldman, 2003). Values predict support for and belief in a variety of political ideologies. Equality values (both in distribution of outcomes and opportunities) are a main predictor of political candidate preferences (Miller & Shanks, 1996; Rokeach, 1973), racial attitudes (Sears, Henry, & Kosterman, 2000), and placement of the left-right ideological spectrum (Bobbio, 1996; Jost, Glaser, Kruglanski, & Sulloway, 2003; Verba et al., 1987). Barnea & Schwartz (1998) found that voting for an Israeli political party was based on ideological dimensions (state and religion, classical liberalism), which was, in turn, predicted by corresponding values. Italians on the center left of the left-right ideological spectrum have been found to value universalism, benevolence, and self-direction and conversely devalue power, achievement, tradition, and conformity (Caprara, Schwartz, Capanna, Vecchione, & Barbaranelli, 2006). Support for the liberal value of equality in an Italian sample was positively associated with self-transcendent values (benevolence and universalism) which emphasize equality among people and concern for the welfare of others (Schwartz, Caprara, & Vecchione, 2010). Support for equality in the same

sample was also negatively associated with self-enhancement values (achievement, power, stimulation, and hedonism), which emphasize control over others and self-interest in pursuing goals. Since values predict political attitudes, dual process accounts of political attitudes may help understand values as well.

### **Low-Effort Thought and Political Attitudes**

Conservatism may be a basic, easy way of thinking, while other ideologies may require cognitive effort to override these initial, conservative responses. Low-effort, primary processes can influence political judgments (Eidelman, Crandall, Goodman, & Blanchard, 2012). When participants' executive function was impaired (i.e., via blood alcohol content, time pressure, cognitive load, and explicit low-effort instructions), they were more likely to endorse conservative policies and ideas. The core ideology of political conservatism emphasizes preference for the status quo and acceptance of hierarchy and inequality (Jost et al., 2003). Research on existence bias (Eidelman, Crandall, & Pattershall, 2009) suggests that people infer goodness from mere existence and that preference for the status quo increases under cognitive load. Automatic processing may also promote hierarchy as another key feature of conservatism. Hierarchy can be defined as differential social power, prestige and privilege as a result of group membership (group-based hierarchy) or individual characteristics (individual-based hierarchy; Sidanius & Pratto, 1999). Conversely, equality is considered an even distribution of power, resources, and/or prestige regardless of group membership or individual characteristics.

Hierarchical values may follow a dual process model of cognition—although people explicitly reject inequality of treatment and opportunity, hierarchy may be valued at a basic, effortless level. Social stratification can ease processing by providing rules for distribution of social and material resources (both positive and negative) and predicting role-based behavior



(Leavitt, Dill, & Eyring, 1973). In the American context, there seems to be widespread explicit attitudes that society should strive for and value equality (Sears et al., 2000). Americans across demographic groups believe an ideal wealth distribution would be more egalitarian than the current distribution (Norton & Ariely, 2011). We may dislike hierarchy for many reasons, such as a belief that social organization in this form is cold, impersonal, inefficient, and corrupt (Leavitt, 2005). There is a tension between a society's emphasis on equality of opportunity and the need to justify or rationalize one's (lower) social standing in society (e.g., Lane, 1959). Recent research has argued for the ease of both equality and of hierarchy.

**Equality heuristic?** Messick and Schell (1992) argued that there is an equality heuristic. When people allocate resources they rely on equal distribution as a rule of thumb or anchor and adjust distribution based on circumstances, such as external-internal attributions. This tendency to rely on equal distribution is enhanced with increased cognitive load. Participants were more likely to request common resources for their own benefit with attentional resources available, compared to those whose attention was divided (Roch, Lane, Samuelson, Allison, & Dent, 2000). Kameda, Takezawa, Ohtsubo, & Hastie (2010) argued that people are especially likely to rely on egalitarianism as a fundamental principle under conditions of uncertainty. They suggested that egalitarianism provides a means of risk-reduction because risk is pooled collectively—equality is a means of caution.

Equality can be practically inefficient however—people may agree that equality is appropriate, but not on what dimensions should be used to establish equality. For example, resources could be divided based on simple membership in a group, status of membership in a group (e.g., child v. older adult), amount of effort or achievement, length of membership in a group, or consistency or stability of the resource in question, among other dimensions (e.g.,

Messick, 1993). People are also more likely to violate the equality heuristic when dividing non-partitioned resources, especially in large groups (e.g., a bag of sand as opposed to a pile of bricks; Allison, McQueen, & Schaerfl, 1992). Allison et al. posited that people tend to overestimate what constitutes an equal portion as the number of portions increases and this self-serving bias in non-partitioned resources is less likely to be detected by others. They also suggest that larger groups heighten competition and raise fears of resource deprivation. The equality heuristic may only apply to the distribution of tangible, partitioned resources—not non-partitioned, abstract social resources such as power and prestige. Social status and power are likely to exist as hierarchies and be fungible in creating inequality of resources (Pratto et al., 2010), even though equality may serve as an anchor-point in dividing resources.

**Ease of hierarchy attitudes.** There is much evidence to suggest that people form, detect, and process hierarchy easily and instinctively. All human societies are structured hierarchically based on group membership (Sidanius & Pratto, 1999). Inequality tends to develop spontaneously even when people begin equally and are not motivated to compete (Pratto, Pearson, Lee, & Saguy, 2008). Even low-status group members show an implicit preference for dominant group members and perpetuate these systems of dominance (e.g., Jost, Pelham, & Carvallo, 2002; Rudman, Feinberg, & Fairchild, 2002). People tend to detect social status information quickly, even when cognitive ability is limited (Ambady, Bernieri, & Richeson, 2000; Costanzo & Archer, 1989; Moors & De Houwer, 2005). These subtle cues of dominance and deference instinctively motivate individuals to either complement or compete for dominance (Mazur & Cataldo, 1989). People are inclined to like interaction partners more when placed in complementary, hierarchical roles (Dryer & Horowitz, 1997; Tiedens & Fragale, 2003; Tiedens, Unzueta, & Young, 2007). Social dominance relations between individuals are even detected and

expected by infants (Mascaro & Csibra, 2012; Thomsen, Frankenhuis, Ingold-Smith, & Carey, 2011), suggesting that people come to understand and reproduce social relationships as hierarchical early in life. Zitek and Tiedens (2012) show that hierarchical relationships are processed more fluently than egalitarian relationships and that this processing fluency leads to a preference for hierarchy.

The degree of inequality in a society and the beneficiaries of this unequal structure are justified through legitimizing myths (Sidanius & Pratto, 1999). These myths are alternatively hierarchy enhancing and hierarchy attenuating, ultimately serving to maintain a point of hierarchical equilibrium, or point where society is organized hierarchically, but is not “morally offensive or structurally destabilizing” (Sidanius & Pratto, 1999, pp. 52). Hierarchy may provide a psychological advantage in that it requires little effort or justification. That is, support for hierarchy may follow from automatic processes. Given conservatism (including hierarchy attitudes) follows from low-effort thought processes and value expression may differ under automatic and controlled processing, will low-effort thought promote the conservative value of hierarchy?

### **The Current Studies**

I propose that conservative values and ideology are well learned and act as an automatic, effortless way of thinking, while other ideologies require cognitive effort to develop and endorse. Support for hierarchy, as a core component of political conservatism (e.g., Jost, et al., 2003), should follow from quick and easy thought. Conversely, support for equality should require difficult, effortful thought processes to “correct” for this initial tendency toward hierarchy. People should rate equality values lower in importance as guiding principles in their lives and

hierarchy values higher in importance as thought processes become less effortful and more efficient.

I disrupted effortful thought processes and examined subsequent endorsement of hierarchy and equality values in four studies. Effortful thought was disrupted via alcohol intoxication (Study 1), explicit instructions to respond with low-effort thought, high-effort thought, or affective reaction (Studies 2 & 3), and ego depletion (Study 4). Across these studies, I predicted that low-effort thought would promote the value of hierarchy while reducing the opposing value of equality. If low-effort thought does influence evaluations of hierarchy and equality in the predicted direction, these studies would suggest that low-effort thought promotes not only conservative ideas and policies, but also conservative values, such as acceptance of hierarchy.

### **Study 1**

Since alcohol intoxication impairs deliberative processing while leaving superficial processing largely uninfluenced (e.g., Abrams, Fillmore, & Marczinski, 2003; Bartholow, Dickter, & Sestir, 2006), Study 1 used alcohol as a way to examine the effects of depth of thought processing on ratings of social values. Bar patrons rated Schwartz values and blew into a breathalyzer to determine blood alcohol content. If low-effort thought promotes acceptance of hierarchy, the disruption of effortful processing via alcohol consumption should lead to lower ratings of equality values while hierarchy values should be evaluated as more important.

### **Method**

#### **Participants**

One-hundred fourteen bar patrons in Lawrence, KS agreed to complete a survey in exchange for \$1 and the opportunity to learn their blood alcohol content (BAC). Six people did

not complete the entire survey, and one participant's BAC was not recorded; these participants were excluded from subsequent analyses. The remaining 107 participants (65 men, 36 women, 6 undisclosed) ranged in age from 21-60 ( $M = 25.43$ ,  $SD = 7.68$ ). Participants were 72% White American, 7.5% Latino/a, 5.6% Multi-racial, 5.6% self-described as "other," 4.7% African American, 3.7% Asian/Pacific Islander, and .9% American Indian/Alaskan Native.

### **Procedure**

Experimenters stood outside bar exits in pairs. Experimenters approached every third patron as they exited the bar and asked if they would be willing to complete a short survey and learn their blood alcohol content. Patrons completed the survey individually, though several had friends waiting nearby ( $N = 16$ ). Those who agreed completed the survey and blew into the breathalyzer. Participants were then told their blood alcohol content, paid, and thanked for participating.

### **Measures**

**Values.** Participants rated the extent to which three values, drawn from Schwartz's theory of value structure and content (Schwartz, 1992; 1994), were important as guiding principles in their lives on a 9-point Likert scale ranging from -1 (*Opposed to My Values*) to 7 (*Very Important*). The 10 Schwartz values were pilot-tested using 104 KU students for the degree to which values related to hierarchy using a 5-point Likert scale (1 = *Hierarchy*; 5 = *Equality*; See Appendix A). Based on pilot testing, participants rated the importance of *power* ( $M = 1.26$ ,  $SD = .65$ ), *benevolence* ( $M = 3.49$ ,  $SD = 1.26$ ), and *universalism* ( $M = 4.61$ ,  $SD = .72$ ), followed by a brief description of the value (See Appendix B). Benevolence and universalism were averaged to create an Equality Values score ( $M = 5.67$ ,  $SD = 1.35$ ;  $r = .31$ ).

**Blood Alcohol Content (BAC).** I assessed BAC using an AlcoMate Premium breathalyzer (AK GlobalTech Corporation, *Palisades Park, NJ*). Participants were asked to blow a steady stream of air into the breathalyzer until a reading was displayed. The breathalyzer was calibrated prior to data collection and a fresh mouthpiece was used for each participant. Participants represented a wide range of BAC levels from .000 to .171 ( $M = .06$ ,  $SD = .05$ ).

**Political Ideology.** Political ideology was assessed using a single-item scale ranging from 0 (*Liberal*) to 9 (*Conservative*;  $M = 3.63$ ,  $SD = 2.58$ ; See Appendix C).

### Results

Values were centered based on individual value means prior to data analysis to correct for individual differences as is standard (see Schwartz, 2006). I regressed BAC, self-reported political ideology, and the interaction between BAC and ideology on the rated importance of the value of equality. Regression analyses revealed that, as alcohol intoxication increased, endorsement of equality values significantly decreased,  $\beta = -.22$ ,  $t(106) = -2.31$ ,  $p = .023$ . There was also a significant effect of political ideology,  $\beta = -.20$ ,  $t(106) = -2.15$ ,  $p = .034$ ; as conservatism increased, endorsement of equality values decreased. When the interaction between BAC and political ideology was added as a predictor in the model, it did not significantly predict valuing equality,  $\beta = -.24$ ,  $t(106) = -1.07$ ,  $p = .29$ , or improve model fit,  $\Delta R^2 = .01$ ,  $p = .29$  (See Table 1). This suggests that BAC influenced participants' ratings of equality values regardless of individual differences in political ideology. BAC was uncorrelated with political ideology overall ( $r = -.01$ ,  $p = .906$ ).

As exploratory analyses, I examined curvilinear regression trends of equality values on BAC. Model fit was not improved by testing for BAC as a quadratic predictor,  $\Delta R^2 = .00$ ,  $p = .926$ . Inclusion of BAC as a cubic predictor marginally improved model fit,  $\Delta R^2 = .03$ ,  $p = .088$ .

This suggests that the effect of BAC may follow a cubic trend,  $\beta = -1.65$ ,  $t(106) = -1.72$ ,  $p = .088$ . Based on the graph of the cubic trend (See Figure 2), it appears that the slope of equality values on BAC was negative when BAC was less than .05. This slope was almost flat at moderate values of BAC (between approximately .05 and .10) and became negative again when BAC exceeded .10.

I also regressed BAC, self-reported political ideology, and the interaction between BAC and ideology on the rated importance of the value of power. Regression analyses revealed that, as alcohol intoxication increased, endorsement of power value significantly increased,  $\beta = .22$ ,  $t(106) = 2.31$ ,  $p = .023$ . There was a significant effect of political ideology,  $\beta = .20$ ,  $t(106) = 2.15$ ,  $p = .034$ ; as conservatism increased, endorsement of power increased. When the interaction between BAC and political ideology was added as a predictor in the model, it did not significantly predict valuing power,  $\beta = .24$ ,  $t(106) = 1.07$ ,  $p = .29$ , or improve model fit,  $\Delta R^2 = .01$ ,  $p = .29$  (See Table 2). This suggests that BAC influenced participants' ratings of the value of power regardless of political ideology.

As exploratory analyses, I examined curvilinear regression trends of power values on BAC. Model fit was not improved by testing for BAC as a quadratic predictor,  $\Delta R^2 = .00$ ,  $p = .926$ . Inclusion of BAC as a cubic predictor marginally improved model fit,  $\Delta R^2 = .03$ ,  $p = .088$ . This suggests that the effect of BAC may follow a cubic trend,  $\beta = -1.65$ ,  $t(106) = -1.72$ ,  $p = .088$ . Based on the graph of the cubic trend (See Figure 3), it appears that the slope of power values on BAC was positive when BAC was less than .05. This slope was almost flat at moderate values of BAC (between approximately .05 and .10) and became positive again when BAC exceeded .10.

A dependent, or paired-samples, *t*-test suggested that participants rated equality values ( $M = .88$ ,  $SD = .94$ ) as significantly more important than the value of power ( $M = -1.77$ ,  $SD = 1.87$ ),  $t(106) = 9.77$ ,  $p < .001$ ,  $d = .94$ . Participants viewed equality as more important than hierarchy overall. There was a perfect negative correlation,  $r = -1.00$ ,  $p < .001$ , between equality values and power values because values were individually mean centered. The correlation between values prior to standardization was also significantly negative,  $r = -.42$ ,  $p < .001$ .

### **Discussion**

As blood alcohol content increased, bar patrons reduced in equality values. In contrast, bar patrons valued power more as blood alcohol content increased. Results are consistent with the idea that hierarchy may follow from initial thought processes, while equality requires greater cognitive effort to endorse—even when participants held liberal political attitudes.

There is no evidence that differences in value endorsement were due to pre-existing attitudes—BAC was uncorrelated with political ideology, and there was no significant interaction between BAC and ideology. This explanation of pre-existing attitudes is unlikely since self-reported political attitudes (conceptually related to equality attitudes) did not correlate or interact with BAC. These data are correlational and reverse causality may be possible. People who view equality as relatively unimportant may be more likely to drink and have high BAC. To rule out the possibility of reverse causality, Study 2 directly manipulates effortful thought to demonstrate that low-effort leads to shifts in value priorities.

### **Study 2**

In Study 2, I experimentally manipulated thought processing by instructing participants to rate values while thinking either deliberately or superficially, following Eidelman et al. (2012). If endorsement of hierarchy is basic or effortless, then reducing effortful thought that may allow



people to “correct” for this tendency should reduce endorsement of equality values, but raise importance of hierarchy values.

## **Method**

### **Participants**

One-hundred six KU undergraduates participated in exchange for course credit. Four participants did not complete all questionnaires and were subsequently excluded from analysis. The remaining 102 participants (50 men, 49 women, 3 undisclosed) were 69.0% Caucasian, 9.0% Asian/Pacific Islander, 9.0% multi-racial, 6.0% Black/African American, 4.0% Latino/a, 1.0% Native American, and 2.0% “other.” Participant ages ranged from 18-38 years old ( $M = 19.88$ ,  $SD = 2.59$ ).

### **Procedure**

Participants completed the survey individually on paper in the laboratory. They were randomly assigned to instructions to use either careful, deliberative thought (high-effort), or quick, superficially thought (low-effort) while completing surveys on their attitudes toward hierarchy and equality. Participants reported the same basic demographic information assessed in Study 1 (See Appendix C). Experimenters debriefed participants and thanked them for their participation.

### **Processing Effort Manipulation**

In the *high-effort processing condition*, experimenters instructed participants to “complete the questionnaires at your own pace. Take your time and think carefully about your responses.” In the *low-effort processing condition*, experimenters instructed participants to “complete the questionnaires as quickly as you can. It is very important to respond with your first, gut-level answer.”

## Measures

**Evaluation of Hierarchy and Equality.** Participants rated the 10 value types taken from Schwartz's Value Survey (self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism) followed by a brief description of the value (e.g., "*Power. Social status and prestige, control or dominance over people and resources*"; Schwartz & Boehnke, 2004). Participants rated how important each value was as a guiding principle in their life using the same scale as in Study 1; See Appendix D). Benevolence and universalism ( $r = .28$ ) were averaged to create an Equality Values score. Power and achievement ( $r = .22$ ) were averaged to create a Hierarchy Values score, in accordance with the rated association of values with hierarchy and equality found in pilot testing (*power*:  $M = 1.26$ ,  $SD = .65$ ; *achievement*:  $M = 2.55$ ,  $SD = 1.25$ ; *benevolence*:  $M = 3.49$ ,  $SD = 1.26$ ; *universalism*:  $M = 4.61$ ,  $SD = .72$ ; see Study 1).

**Political Ideology.** Political ideology was assessed using a single-item scale ranging from 0 (*Liberal*) to 9 (*Conservative*;  $M = 4.39$ ,  $SD = 2.07$ ; See Appendix C).

## Results

Values were centered based on individual value means prior to data analysis (See Schwartz, 2006). Values were significantly negatively correlated prior to standardization ( $r = -.26$ ,  $p = .009$ ). After individually mean-centering values, there was a significant negative correlation,  $r = -.48$ ,  $p < .001$ , between equality values ( $M = .06$ ,  $SD = 1.10$ ) and hierarchy values ( $M = -.21$ ,  $SD = .91$ ). This correlation was significantly negative within both the low-effort ( $r = -.39$ ,  $p = .005$ ) and high-effort ( $r = -.49$ ,  $p < .001$ ) conditions.

To assess the influence of effortful thought processing on hierarchy and equality values, I conducted a mixed-model ANCOVA with effortful thought (high-effort; low-effort) and political

ideology as between-subjects factors and the two value ratings as a within-subjects factor. The interaction between values and thinking condition was marginally significant,  $F(1, 98) = 3.30, p = .072, \eta_p^2 = .03$  (See Figure 4). Analysis of simple main effects revealed that participants in the low-effort thought condition rated hierarchy values as significantly more important ( $M = .01, SD = .15$ ) compared to the high-effort thought condition ( $M = -.43, SD = .12$ ),  $F(1, 98) = 6.03, p = .016, \eta_p^2 = .06$ . Participants in the low-effort thought condition also rated equality values as significantly less important ( $M = -.23, SD = .15$ ) compared to the high-effort thought condition ( $M = .33, SD = .126$ ),  $F(1, 98) = 7.62, p = .007, \eta_p^2 = .07$ .

There was a significant interaction between values and political ideology,  $F(1, 98) = 4.40, p = .039, \eta_p^2 = .04$ . I examined simple slopes using regression analysis, controlling for thinking condition. Political ideology did not significantly predict hierarchy values,  $\beta = -.05, t(101) = -.53, p = .60$ , but did predict equality values,  $\beta = -.35, t(101) = -3.86, p < .001$ . As participants increased in conservatism, they valued equality less. This suggests that politically conservatism may have been a stronger predictor of opposition to equality compared to support for power and status.

Participants rated equality values as slightly more important overall ( $M = .05, SD = 1.10$ ) than hierarchy values ( $M = -.21, SD = .91$ ), although this difference was not significant,  $F(1, 100) = 2.48, p = .119$ . The interaction between values, thinking condition, and political ideology was not significant,  $F(1, 98) = .35, p = .560, \eta_p^2 = .004$ . This suggests that ease of thought processing influenced participants' ratings of the values regardless of political ideology.

There was no significant effect of thinking conditions on the values of conformity, hedonism, security, stimulation, self-direction or tradition,  $ps > .07$ . For all means and standard deviations across conditions see Table 3.

## Discussion

When participants were instructed to use low-effort thought, they evaluated hierarchy values as significantly more important compared to participants instructed to use high-effort thought. Conversely, participants using low-effort thought valued equality less than participants who deliberated carefully. Results supported the hypothesis that depth of thought processing influences the rated importance of human values. Importantly, there was no interaction between political ideology and thinking condition. This suggests that participants shifted toward hierarchy and away from equality with low-effort thought across the political ideological spectrum. Only values related to hierarchy and equality significantly differed between low-effort and high-effort thought as expected—no other values were influenced by depth of thought processing. When individuals did not consider their goals and motivations carefully, they believed that hierarchical goals were more important in their lives. Superficial, or shallow, thought processing may encourage support for hierarchical systems at the expense of egalitarian systems.

The manipulation in this study either encouraged high-effort thought by asking participants to respond slowly and carefully or encouraged low-effort thought by asking participants to respond quickly with their first answer. These manipulated instructions are consistent with dual process models of attitudes where controlled processing is slow and deliberative and automatic processing is quick and highly accessible (e.g., Evans, 2008). It is possible, however, that low-effort thought instructions introduced affect into a largely cognitive task. Participants were asked to either think carefully or respond with their “gut-level” answer. One could argue that these instructions prompted participants to either respond cognitively or emotionally rather than with different levels of effortful thought processing. This inadvertent contamination of the low-effort thought instructions with emotional implications compels me to

propose a three-condition study to clarify the effects of low-effort thought, high-effort thought, and affective processes on valuation of hierarchical and egalitarian principles.

### **Study 3**

Since instructions in Study 2 may have introduced affect into the cognitive task, I sought to clarify the relationship between low-effort thought and values in Study 3. Participants indicated their values using high-effort thought, low-effort thought, or affective reaction to examine the distinct effects of depth of thought processing.

Multiple assessments of values were also included to assess whether value shifts are specific to Schwartz values or occur across a variety of constructs assessing the value towards social equality. These assessments were included in part to assess whether shifts in hierarchy and equality occur in values and attitudes more generally. A shift in attitudes could suggest that hierarchical attitudes are also promoted with low-effort thought or that values promoted with low-effort thought have implications for evaluation of policies related to hierarchy and equality. Finally, participants completed an assessment of Need for Closure (Webster & Kruglanski, 1994). This assessment was included to ensure that the manipulation was influencing depth of thought processing, independent of epistemic needs to reduce uncertainty.

I expected that when participants used low-effort thought, they would rate values related to hierarchy as more important and values related to equality as less important compared to those who used high-effort thought. Affective reaction may influence the perceived importance of values in complex ways. In this study, it was treated in an exploratory manner as a means of distinguishing the effects of low- and high-effort thought from emotional confounds.

### **Method**

#### **Participants**

Participants consisted of 144 KU undergraduates who received course credit for their participation. Five participants were excluded from further analysis due to session interruptions and one was excluded because they did not meet minimum age requirements (18 years old). Of the remaining 138 participants (87 women), ages ranged from 18-34 ( $M = 19.06$ ,  $SD = 2.24$ ). The majority of participants were Caucasian/White (79.7%), with 6.5% Multi-racial, 5.1% Asian/Pacific Islander, 3.6% African American/Black, 2.9% Hispanic/Latino(a), 1.4% self-identified as “other” and .7% Native American.

### **Procedure**

Participants completed questionnaires independently in the laboratory in groups of two to six. Groups were randomly assigned to one of three conditions: low-effort thought, high-effort thought, or affective reaction. At the end of the questionnaire, participants reported the same basic demographic information assessed in Study 1 (See Appendix C).

### **Effort Processing**

In the *high-effort thought* condition, participants were instructed to “think hard about each term before responding. Don’t give your first response. Instead really put forth effort and consider the issue. Take your time and give a careful and thoughtful response.” The *low-effort thought* instructions directed participants to “give your first, immediate response to the terms. Don’t think too hard about your response; don’t debate yourself. Instead, go quickly and give your first, initial response to the terms as soon as you read them.” Finally, participants in the *affective reaction* condition were asked to “give your first, gut-level reaction to the terms. Don’t think too hard about your response. Instead consider how you feel about each term when responding.”

### **Questionnaires**

**Schwartz Values.** Participants rated 18 values drawn from Schwartz's theory of values (Schwartz, 1994). These values included the same 10 values as in Studies 1 and 2 with the addition of eight items. These eight items were added to increase generalizability of responses and to examine specific values within broader value types that may be influenced by low-effort thought, high-effort thought, and affective reaction. Items were added based on pre-testing in which three cognitive psychology graduate students rated the association of terms with hierarchy and equality. These items were taken from the subscales of the 56-item Schwartz Values Survey (Schwartz, 1994) and were rated on a 9-point scale where 1 = *Equality* and 9 = *Hierarchy*. The value terms *authority*, *honoring of parents and elders*, *obedient*, and *social power* were rated as most related to hierarchy ( $M = 7.25$ ,  $SD = .66$ ) while the terms *equality*, *freedom*, *world at peace*, and *social justice* were most related to equality ( $M = 2.25$ ,  $SD = 1.75$ ). With the addition of these eight items to the 10 core value types, participants rated the importance of 18 values using a 9-pt Likert scale, ranging from -1 (*Opposed to My Values*) to 7 (*Of Supreme Importance*; See Appendix E).

**Social Dominance Orientation (SDO).** To examine participants' attitudes towards and preference for social inequality, they completed the Social Dominance Orientation Scale (Pratto et al., 1994). This 16-item scale asked people to rate their agreement with statements on a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*). This scale assesses preferences for social inequality on two dimensions: group-based dominance, and opposition to equality (Jost & Thompson, 2000; See Appendix F). This scale was highly reliable in the current study,  $\alpha = .92$ .

**Protestant Work Ethic (PWE).** To examine the extent to which participants believed that hard work yields positive outcomes and conversely that laziness is a root cause of societal problems, they completed the Protestant Work Ethic Scale (Mirels & Garrett, 1971). This scale

was included as an alternative assessment of values, specifically the extent to which participants value self-reliance, achievement, and devotion to work. Participants indicated their level of agreement with 19 statements on a 7-point Likert scale, (1 = *Very Strongly Disagree* to 7 = *Very Strongly Agree*;  $\alpha = .72$ ; See Appendix G).

**Need for Closure.** To ensure that differences between conditions are not due to epistemic needs, participants completed the 15-item version of the Need for Closure Scale (Roets & Van Hiel, 2011). This scale measures intolerance of ambiguity and the need for definitive answers (Webster & Kruglanski, 1994). Participants indicated their level of agreement using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*;  $\alpha = .83$ ; See Appendix H).

**Political Ideology.** Political ideology was assessed using a single-item scale ranging from 0 (*Liberal*) to 9 (*Conservative*;  $M = 5.06$ ,  $SD = 2.04$ ; See Appendix C).

## Results

Values were centered based on individual value means prior to data analysis (see Schwarz, 2006). I first conducted factor analysis (using promax rotation and the maximum likelihood method) to examine if the traits loaded onto the expected hierarchy and equality factors. Items were excluded if they cross-loaded onto multiple factors or loaded with a score of less than .25. Based on this analysis, authority, power, and social power were averaged to create a hierarchy values score ( $M = -1.47$ ,  $SD = 1.18$ ;  $\alpha = .64$ ). Equality, universalism, peace, and justice were average to create an equality values score ( $M = .28$ ,  $SD = .90$ ;  $\alpha = .57$ ). For means and standard deviations of all dependent variables across conditions, see Table 4.

Correlational analysis demonstrated that hierarchy values and equality values were negatively associated ( $r = -.56$ ,  $p < .001$ ). SDO was positively associated with hierarchy values ( $r = .46$ ,  $p < .001$ ), and negatively associated with equality values ( $r = -.53$ ,  $p < .001$ ). Neither



hierarchy nor equality values were significantly associated with political ideology ( $r_{\text{hierarchy}} = .05$ ,  $p = .580$ ;  $r_{\text{equality}} = -.14$ ,  $p = .116$ ), PWE ( $r_{\text{hierarchy}} = .11$ ,  $p = .207$ ;  $r_{\text{equality}} = -.14$ ,  $p = .113$ ), or need for closure ( $r_{\text{hierarchy}} = -.01$ ,  $p = .874$ ;  $r_{\text{equality}} = -.01$ ,  $p = .897$ ). For all correlations within each condition, see Table 5. For correlations prior to standardization of value measures, see Table 6.

To examine the influence of effort processing on values, I conducted a mixed-model ANCOVA with processing condition and political ideology as between-subjects variables and value ratings as a within-subjects factor. There was a significant difference between ratings of equality values and hierarchy values,  $F(1, 131) = 25.62$ ,  $p < .001$ ,  $\eta_p^2 = .16$ , such that equality values were rated significantly more important than hierarchy values. The interaction between processing condition and values was not significant,  $F(2, 131) = .48$ ,  $p = .618$ ,  $\eta_p^2 = .007$ , nor was the interaction between values and political ideology,  $F(1, 131) = 1.12$ ,  $p = .293$ ,  $\eta_p^2 = .008$ . The three-way interaction between values, political ideology, and condition was also not significant  $F(2, 131) = .19$ ,  $p = .829$ ,  $\eta_p^2 = .003$ <sup>1</sup>.

Analysis of planned comparisons between conditions revealed significant differences in rated importance of hierarchy among conditions. Participants in the low-effort condition rated hierarchy as significantly more important ( $M = -1.19$ ,  $SD = 1.20$ ) than in the high-effort condition ( $M = -1.60$ ,  $SD = 1.09$ ),  $p = .047$ , one-tailed. There was no significant difference between the low-effort and affect condition ( $M = -1.54$ ,  $SD = 1.15$ ),  $p = .082$ , the affect and high-effort condition,  $p = .416$ , or in equality values between conditions,  $ps > .14$ , all tests one-tailed (See Figure 5).<sup>2</sup>

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<sup>1</sup> When gender and race were included as covariates, the effects of condition remained non-significant, all two-tailed  $ps > .52$ .

<sup>2</sup> When benevolence and achievement were included in the hierarchy and equality value scores all effects of condition non-significant, all two-tailed  $ps > .18$

A series of one-way ANOVAs tested the effects of processing condition on SDO, PWE, and need for closure. The effect of processing condition was not significant on SDO, PWE, need for closure, or political ideology (all  $F_s < 1$ ). There was a significant effect of thinking condition on hedonism,  $F(2, 135) = 4.77, p = .010$ , such that hedonism was valued significantly more under high-effort thought ( $M = .15, SD = 1.49$ ) compared to low-effort thought ( $M = -.73, SD = 1.68; p = .022$ ) and affective reaction ( $M = -.71, SD = 1.64; p = .028$ ). There was no significant difference between low-effort thought and affective reaction,  $p = .998$ . There was no significant effect of thinking conditions on the values of achievement, benevolence, conformity, freedom, honor, obedience, security, self-direction, stimulation, or tradition,  $ps > .11$ .

### **Discussion**

When participants used low-effort thought, they were expected to rate hierarchy values as more important and equality values as less important than participants using high-effort thought. Results partially supported this hypothesis. When participants used low-effort thought, they valued hierarchy more compared to participants using high-effort thought. There were no significant differences between low-effort thought and affective reaction or high-effort thought and affective reaction in valuing hierarchy. Type of thought processing did not influence evaluations of equality values, contrary to expectations. As expected, depth of thought processing did not influence values unrelated to hierarchy and equality, with the exception of hedonism. This low-rate of unexpected value shifts is what might be expected by chance, given the amount of tests all reported studies. Type of processing also did not influence SDO, PWE or Need for Closure. Results suggest that low-effort thought processing did not influence attitudes related to hierarchical and egalitarian values. This work provides support for the idea that impairment of deliberative thought predicts increased endorsement of hierarchical values.

Although this study supports the notion that valuing hierarchy follows from low-effort thought, it did not replicate effects from Studies 1 and 2 that egalitarianism is promoted with high-effort thought. There may be several reasons why results are incongruent with prior work.

The current study did not include a manipulation check and so it is unclear if the explicit instructions to use low-effort thought, high-effort thought, or affective reaction effectively primed different thought processing among groups. Participants may not have followed directions, either deliberately or unintentionally, although no participants reported any difficulty following directions. Future work should include such a manipulation check, for example, by asking participants to repeat the response directions at the end of the study, by timing responses (high-effort thought should take more time than the other two conditions), or by completing an assessment of executive function. Study 4 directly manipulates the availability of cognitive resources rather than relying on participants to follow directions.

The assessment of hierarchy and equality values varied from measures used in Studies 1 and 2. Additional values pre-tested as related to hierarchy and equality were included in this study to attempt to capture multiple dimensions of these values. However, the final factor structure excluded values used in studies 1 and 2, benevolence and achievement. This is perhaps unsurprising given that the ten main value types form distinct factors or regions (e.g., Schwartz, 2012). The selective inclusion of eight values in addition to the ten main value types (based on pilot testing) may have confused measurement of the value structure. Since values are interdependent (Schwartz 1994; 1996), the inclusion of some values, but not others may have biased responses. Participants may have unintentionally weighted some values more than others because the value type appeared more frequently on the survey or because it was more salient.

Future studies should focus only on opposing value types or on all values rather than mixing the two methods. Study 4 uses the original, 10-item value survey to avoid this potential bias.

#### **Study 4**

Studies 1, 2, and 3 provide evidence that hierarchy values are promoted with automatic thought processes. Studies 1 and 2 also suggest that equality is valued less with low-effort, compared to high-effort thought. Study 4 expands upon the previous studies by directly manipulating depth of thought processing through the *availability* of cognitive resources. Participants completed either a difficult task requiring executive control or an easy, effortless task. As ego depletion literature suggests, tasks that require high concentration should exhaust mental energy needed for subsequent tasks (Baumeister, Bratslavsky, Muraven, & Tice, 1998) and disrupt controlled processing (Govorun & Payne, 2006; Schmeichel, Vohs, & Baumeister, 2003). Participants persisted for less time on demanding puzzles and anagrams when controlling their diet, choosing a speech topic, and suppressing their emotions (Baumeister et al., 1998). When resources are depleted, people are also more likely to act aggressively (Stucke & Baumeister, 2006), less likely to perform well on tests of logic and reasoning (Schmeichel et al., 2003), less able to detect deception (Reinhard, Scharmach, & Stahlberg, 2012), and less able to resist persuasion (Wheeler, Briñol, & Hermann, 2007). Recent accounts of ego depletion suggest that engaging in self-control causes a shift in motivational orientation toward gratification of and away from inhibition of desires on subsequent tasks (Inzlicht & Schmeichel, 2012). Ego depletion may motivate people to pursue their desires with decreased inhibitory abilities. Diminished self-control may motivate the pursuit of self-enhancement values, power and achievement

Participants should rely on low-effort, easy thought processes as they assess their value priorities when cognitive resources are depleted. To the extent that endorsement of hierarchy results from efficient thought processes, participants should rate equality lower in importance after completing a difficult task requiring acts of self-control compared to those who complete a simplified task. Hierarchy values should be rated as more important as a result of depleted resources.

## **Method**

### **Participants**

Participants consisted of 127 KU undergraduates who participated in exchange for course credit. Seventeen participants were excluded because their identification numbers were improperly recorded ( $N = 13$ ) or because they indicated suspicion as to the true nature of the tasks during debriefing ( $N = 4$ ). The remaining sample consisted of 110 participants (72 women) whose ages ranged from 18 to 28 ( $M = 18.87$ ,  $SD = 1.51$ ). The majority of participants were Caucasian/White (86.4%) with races/ethnicities also including African American/Black (5.5%), Latino/a (4.5%), Asian (1.8%), Multi-racial (.9%) and self-identified “other” (.9%).

### **Procedure**

Participants came into the laboratory in groups of up to four. They completed the task individually and were randomly assigned to one of two experimental conditions (ego depletion v. control). Participants were told the study was examining cognitive aspects of social attitudes. They completed an ego depletion task or a control task via the Stroop paradigm followed by a questionnaire relating to support for and perceived importance of values. Since affirming values can bolster self-regulation (Schmeichel & Vohs, 2009), participants completed a second ego depletion or control task using anagrams before completing additional questionnaires about their

social attitudes. Ego depletion or control assignments were consistent within participants—participants completed either both ego depletion tasks or both control tasks. Participants reported their mood to ensure that any differences between conditions were not due to priming negative or positive mood, but were due to changes in self-regulation, as is standard in ego depletion research (e.g., Balliet & Joireman, 2010; Schmeichel & Vohs, 2009; Vohs, Baumeister, Ciarocco, 2005). Participants reported the same demographic information assessed in Study 1 (See Appendix C). Finally, participants were debriefed and thanked for their participation.

### **Ego Depletion Manipulations**

**Stroop Task.** The Stroop task requires control of executive attention (Engle, 2002; Macleod, 1991) and is a common ego depletion task (e.g., Vohs, Baumeister, & Ciarocco, 2005). Participants completed the Stroop task (called the “Color task” to participants) using Inquisit software. Participants indicated the color in which words or blocks were printed using corresponding keys (d, f, j, and k) on the keyboard. In the *control condition*, participants only viewed words in which the word and color of the word were congruent (e.g., the word “blue” printed in blue). In the *ego depletion condition*, participants were given the more difficult task of indicating the color in which words and the color of the word were either congruent or incongruent (mostly incongruent). For example, participants may see the word “blue” printed in yellow and would have to click the key for the word “yellow.”

**Anagrams.** For the second ego depletion task, participants completed either difficult or easy anagrams. In the *control condition*, participants worked on 10 anagrams from the Chicago Tribune website designed for children. In the *ego depletion condition*, participants worked on 10 anagrams from the Chicago Tribune website designed for adults. The final anagram was unsolvable to ensure that even if participants were skilled at anagrams, they were sufficiently

challenged (See Appendix I). Participants worked until they had either solved all the anagrams or worked for 10 minutes. The number of correctly solved anagrams was recorded.

## Measures

**Schwartz Values Survey (SVS).** Participants completed the same measure of values as in Study 2; however the value of authority was mistakenly included instead of the value of tradition (See Appendix J). The unstandardized correlations between achievement and power ( $r = .14$ ) and between universalism and benevolence ( $r = .11$ ) were relatively low. These low correlations are consistent with prior literature as a methodological artifact because values are ipsative (Feldman 2003; Schwartz, 1994).

**Visual Representations of Hierarchy.** Since Americans tend to hold egalitarian social norms and reject explicit, hierarchical *statements* (e.g., Leavitt, 2005), participants rated visual representations of hierarchical and egalitarian relationships. Participants may be willing to express positive views towards hierarchy when confronted with a *depiction* of actual relationships – even if they reject *statements* that promote hierarchical social order. The diagrams were taken from Zitek and Tiedens (2012), and showed hierarchical relationships, egalitarian relationships, and chunked relationships (See Appendix K). As in Zitek and Tiedens (2012), the chunked diagram was included for divergent validity because it differentiates groups of people without specifying rank order. Participants rated the diagrams using 7-point Likert scales for the extent to which they liked the diagram (1 = *Strongly Dislike*; 7 = *Strongly Like*), thought the relationships between people as depicted was efficient (i.e., smooth interactions, not as in thought efficiency; 1 = *Very Inefficient*; 7 = *Very Efficient*), and beneficial to the individuals in the relationship (1 = *Benefit Significantly*; 7 = *Suffer Significantly*; reverse coded). This scale

demonstrated sufficient reliability for the hierarchy diagram ( $\alpha = .67$ ), the equality diagram ( $\alpha = .68$ ), and the chunked diagram ( $\alpha = .77$ ).

**Social Dominance Orientation (SDO).** Participants completed the same SDO scale used in Study 3 (See Appendix F;  $\alpha = .94$ ).

**Protestant Work Ethic (PWE).** Participants completed the same PWE scale used in Study 3 (See Appendix G;  $\alpha = .75$ ).

**Humanitarianism-Egalitarianism Scale (HE).** To examine participants' orientation toward communalism or adherence to ideals of equality, social justice, and concern for others, they completed the 10-item Humanitarianism-Egalitarianism Scale (Katz & Hass, 1988). Participants indicated their agreement with statements (e.g., *everyone should have an equal chance and an equal say in most things*) using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). This measure was included as an alternative assessment of equality values. This scale has been found to be highly reliable in past research ( $\alpha = .83$ ; Katz & Hass, 1988; See Appendix L) and was highly reliable in the current study as well ( $\alpha = .92$ ).

**Positive and Negative Affect Schedule (PANAS).** To assess participants' mood at the time of the survey, they completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This 20-item scale assesses positive and negative mood states. Due to experimenter error, only 17-items were recorded. Participants used a 5-point Likert scale (1 = *Very Slightly or Not at All*, 5 = *Extremely*) to indicate the extent to which they felt each mood in the present moment (See Appendix M). Examples of positive items include: *alert, interesting, and determined*. Examples of negative items include: *nervous, upset, and hostile*. This measure was highly reliable for both positive ( $\alpha = .91$ ) and negative affect ( $\alpha = .82$ ). This measure was



included as an assessment of divergent validity to ensure that any differences between groups was not due to positive or negative affect, but rather due to resource depletion.

**Political Ideology.** Political ideology was assessed using a single-item scale ranging from 0 (*Liberal*) to 9 (*Conservative*;  $M = 4.78$ ,  $SD = 2.06$ ; See Appendix C).

## Results

Values were again centered based on individual value means prior to data analysis (See Schwarz, 2006). See Table 7 for correlations between dependent measures before and after standardization. Notably, PWE and the diagram ratings (equality, hierarchy, and chunked) were not significantly correlated with any other measure of hierarchy attitudes, including ratings of other diagrams (all  $ps > .08$ )<sup>3</sup>. This suggests that PWE and the diagrams were not an optimal assessment of attitudes towards hierarchy. For all correlations within each condition, see Table 8.

### Manipulation Check

I first examined the efficacy of the ego depletion manipulation by examining differences in task performance and affect between groups using a series of independent samples *t*-tests.

**Stroop Task.** Participants in the ego depletion condition made significantly fewer correct responses in the Stroop task ( $M = 94.94$ ,  $SD = 5.08$ ) than the control condition ( $M = 96.83$ ,  $SD = 3.38$ ),  $t(109) = -2.28$ ,  $p = .025$ ,  $d = .44$ . Participants in the ego depletion condition also had significantly longer average response latencies ( $M = 1131.18$ ,  $SD = 295.36$ ) than the control group ( $M = 888.03$ ,  $SD = 200.12$ ),  $t(109) = 5.02$ ,  $p < .001$ ,  $d = .96$ . Even when incongruent trials were not included in analysis (only comparing congruent and control trials), participants in the ego depletion condition had longer response latencies ( $M = 1038.52$ ,  $SD = 245.01$ ) compared to

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<sup>3</sup> The chunked diagram was marginally associated with Humanitarianism-Egalitarianism ( $r = -.17$ ,  $p = .081$ ) and the hierarchy diagram ( $r = .16$ ,  $p = .092$ ); PWE and the equality diagram were also marginally positively correlated ( $r = .17$ ,  $p = .082$ ). For all other effects  $p > .14$ .

the control ( $M = 888.03$ ,  $SD = 200.12$ ),  $t(109) = 3.51$ ,  $p = .001$ ,  $d = .67$ . Performance on the Stroop task (latency and accuracy) did not significantly correlate with hierarchy and equality values, all  $ps > .37$ .

**Anagram Task.** Participants in the ego depletion condition solved significantly fewer anagrams correctly ( $M = 1.84$ ,  $SD = 1.47$ ) than the control condition ( $M = 9.45$ ,  $SD = .89$ ),  $t(109) = -32.49$ ,  $p < .001$ ,  $d = 6.26$ . Accuracy in completing anagrams did not significantly correlate with hierarchy and equality values, all  $ps > .28$ . These manipulation checks suggest that participants had more difficulty successfully completing both ego depletion tasks.

### **Affect**

Participants in the ego depletion did not have significantly different positive ( $M = 3.28$ ,  $SD = .77$ ) or negative affect ( $M = 1.64$ ,  $SD = .60$ ) compared to the control condition ( $M_{\text{positive}} = 3.24$ ,  $SD_{\text{positive}} = .86$ ;  $M_{\text{negative}} = 1.56$ ,  $SD_{\text{negative}} = .55$ ),  $ts < 1$ , as expected. This suggests that the ego depletion tasks did not influence positive or negative mood, as expected.

### **Ego Depletion Effects**

To examine the influence of ego depletion on values, I conducted a mixed-model ANCOVA with ego depletion condition and political ideology as between-subjects variables and value ratings as a within-subjects factor. Participants rated equality values ( $M = .20$ ,  $SD = 1.09$ ) significantly higher than hierarchy values ( $M = -.33$ ,  $SD = .92$ ) across all conditions,  $F(1, 106) = 7.52$ ,  $p = .007$ ,  $\eta_p^2 = .066$ . Contrary to predictions, there was no significant effect of ego depletion condition on value ratings,  $F(1, 106) = .75$ ,  $p = .389$ ,  $\eta_p^2 = .007$ . There was also no significant effect of political ideology on value ratings,  $F(1, 106) = 2.66$ ,  $p = .106$ ,  $\eta_p^2 = .025$  and no interaction between condition and ideology on values  $F(1, 106) = 1.59$ ,  $p = .210$ ,  $\eta_p^2 = .015$ .

A series of independent *t*-tests examined the effects of processing condition on the relationship diagrams, SDO, PWE, and humanitarianism-egalitarianism. Contrary to expectations, ratings of the hierarchy diagrams, equality diagrams, chunked diagrams, SDO, PWE, and humanitarianism-egalitarianism did not significantly differ between ego depletion and control conditions, all *ts* < 1. There were also no significant effects of thinking conditions on the values of conformity, authority, hedonism, security, self-direction or stimulation, *ps* > .07. Results suggest ego depletion did not have an effect on evaluations of hierarchy and equality compared to the control condition across a variety of measures. See Table 9 for means and standard deviations of all variables within each condition.

I conducted a series of two-way ANOVAs to examine the potential interaction between gender and ego depletion on values, the relationship diagrams, SDO, PWE, and humanitarianism-egalitarianism. It is possible that, because men are dominant group members compared to women, ego depletion would influence views of hierarchy and equality differently as a function of gender. There were no significant interactions between gender and condition on any of the dependent measures (all *ps* > .06)<sup>4</sup>.

### Discussion

This study expanded upon the prior three studies by manipulating the availability of cognitive resources experimentally and examining subsequent evaluations of hierarchy and equality values. In contrast to expectations, this study provided no direct evidence that depleted cognitive resources influenced evaluations of hierarchy and equality across a variety of measures. Results did not support the theory that self-regulation ability influences hierarchy and

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<sup>4</sup> Gender and condition only had a marginal interaction on evaluations of the chunked diagram (*p* = .068); for all other effects *p* > .12. When race was included as a covariate, the interaction between gender and condition remained non-significant with no significant main effects (all *ps* > .07).

equality values, values unrelated to hierarchy and equality, or related social attitudes, such as Humanitarianism-Egalitarianism (Katz & Hass, 1988) and Social Dominance Orientation (Pratto et al., 1994).

There may be several reasons that the ego depletion manipulation did not have the expected effect on values. Participants completed the study in groups and, while no participants indicated being influenced by others in debriefing, it is possible they were concerned about responding in a socially desirable manner (Paulhus, 1984). Future research should have participants complete the study in separate cubicles or timeslots.

Participants in the ego depletion condition had longer response latencies in the Stroop task and completed significantly less anagrams correctly than the control condition. Although this indicated that the manipulation was effective, results also suggest that the task may have been *too* difficult and participants simply stopped expending effort. For example, the last anagram in the ego depletion condition was unsolvable, yet 70.2% of participants entered a response before time ran out, suggesting that they may have given up on solving anagrams correctly and started entering random responses. Disengagement from a task or goal may be adaptive in self-regulation to avoid wasting effort and energy (e.g., Shah, 2005). If participants disengaged, this would indicate that they did not exert or deplete resources. Future research could use slightly easier anagrams or less time for anagrams to ensure that participants still engage with the task mentally and deplete cognitive resources, or use a manipulation with larger documented effect sizes.

### **General Discussion**

The studies investigated hierarchy and equality values as influenced by depth of thought processing. The results of three of four studies conducted supported the hypothesis that low-

effort thought promotes hierarchy values and reduces equality values. Participants generally valued hierarchy more and valued equality less when deliberative thought was impaired or reduced.

Three studies supported the hypothesis that low-effort thought promotes the value of hierarchy. In Study 1, blood alcohol content predicted higher ratings of hierarchy values, independent from political ideology. Participants in Study 2 rated hierarchy values more important when using low-effort compared to high-effort thought. In Study 3, hierarchy was more important to participants using low-effort thought compared to high-effort thought and affective reaction. Study 4, however, provided no evidence that ego depletion influences perceived importance of hierarchy.

Results of Studies 1 and 2 suggest equality is valued to a lesser extent with low-effort thought. Participants with higher blood alcohol content valued equality less in Study 1. Participants instructed to use low-effort thought in Study 2 rated equality values as less important than participants instructed to use high-effort thought. Participants in Study 3 did not rate equality values differently based on high-effort, low-effort, or affective reaction condition. Equality values were also uninfluenced by the ego depletion manipulation in Study 4.

Attitudes of only dominant group members cannot account for findings that low-effort thought promotes hierarchy values. Both men and women using low-effort thought valued hierarchy more studies 1, 2 and 3 and valued equality less in studies 1 and 2. The current samples did not have enough participants of varying races and ethnicities to test for effects of race interacting with condition. Results, however, did not change in significance when race was included as a covariate across all four studies.

If low-effort thought promotes hierarchy and reduces equality, hierarchy may be valued as an automatic, well-learned way of thinking while equality takes more effort to value. The current studies suggest that hierarchy is quickly and easily valued to build upon the knowledge that hierarchy is easily formed, detected, maintained, and processed (e.g., Jost et al., 2002; Moors & De Houwer, 2005; Pratto et al., 2008; Zitek & Tiedens, 2012). Equality is explicitly valued (e.g., Leavitt et al., 1973; Sears et al., 2000), but the value of equality decreases in importance as deliberative thought is impaired. This suggests that hierarchy may be primarily valued, while second-order, controlled processing strengthens the value of equality.

It is possible that a preference for hierarchy under low-effort thought helps explain why low-effort thought promotes political conservatism (Eidelman et al., 2012). The core ideology of political conservatism emphasizes preference for the status quo and acceptance of inequality (Jost et al., 2003). Preference for the status quo is evident under controlled processing and cognitive load (Eidelman et al., 2009). The current work expands upon this research to suggest that hierarchy is valued as an automatic way of thinking. Hierarchy may be a dominant response, while equality requires greater effort to value. Since values underlying attitudes and behaviors, shifts in values may mediate shifts in political attitudes. Future work should include measures of attitudes toward political policy to examine value shifts as potential mediators between low-effort thought and political conservatism.

This work suggests that values can be influenced by unrelated, situational factors, even though values are conceptualized as stable (e.g., Schwartz, 1992). The current studies suggest that value representations can change with automatic processing (compared to controlled processing), without directly priming values or making values salient. Rather, values shifted as a function of environmental characteristics unrelated to values. This study provides support for a

dual-process model of values. Hierarchy was valued more and equality was valued less when controlled processing is inhibited. Prior research suggests that people express values without conscious awareness (e.g., Bardi & Schwartz, 2003). Values may have an unconscious component, even though values are explicitly remembered, identified, and integrated into the self (Brewer & Roccas, 2001; Schwartz & Bilsky, 1987).

The conclusions of this study are qualified by the results of Studies 3 (in part) and 4. Study 4 does not support the hypothesis that hierarchy values increase in importance with low-effort thought. Studies 3 and 4 do not provide evidence that equality values shift with low-effort thought. These results suggest that values may be stable under different levels of thought processing. It is possible that values are difficult to shift, but still may change with ample low-effort thought or other situational manipulations.

### **Limitations and Future Directions**

Shifts in values in Studies 3 and 4 possibly were suppressed since both studies were conducted in groups. Since equality is explicitly and normatively valued (e.g., Sears et al., 2000), this may explain why equality was not reduced with low-effort thought in Studies 3 and 4. Participants could have over-weighted values that are culturally desirable to give a better impression of themselves to others (Fisher & Katz, 2000; Paulhus, 1984). Socially desirable responding has been positively correlated with values that emphasize social harmony, such as benevolence, and negatively correlated with values that challenge social harmony, such as power (Schwartz, Verkasaslo, Antonovsky, & Sagiv, 1997). The motivation to respond in a socially desirable manner when answering questions in groups may have contaminated the automaticity of low-effort thought. Future studies ask participants to complete questionnaires privately to ensure that they do not succumb to social pressure in responding.

Participants in the current studies completed assessments of values based on the ten main value types from Schwartz's theory of values. This assessment differs from traditional value assessments in both length and question type (i.e., the Schwartz Values Survey and the Portrait Values Questionnaire; Schwartz, 1992; 1996; Schwartz, et al., 2001; Schwartz, 2006). I chose to use concise assessments of the main value types to maximize the effect of low-effort thought manipulations. The current studies suggest that this concise measurement may be a valid assessment of values as well. Hierarchy and equality values were negatively correlated across all studies, suggesting that the measurement captured opposing or conflicting values. Convergent validity is evident as Social Dominance Orientation (Pratto et al., 1994) was positively associated with hierarchy and negatively associated with equality (Studies 3 & 4) and Humanitarianism-Egalitarianism (Katz & Hass, 1988) was negatively associated with hierarchy and positively associated with equality (Study 4). Correlations between items within hierarchy and equality indices were relatively low across studies; however this is consistent with prior literature as a methodological artifact of ipsative values (Feldman 2003; Schwartz, 1994). Although this measurement of values is abbreviated compared to traditional measures, the current studies suggest that this measure demonstrates adequate validity.

The processes under which values shift between low-effort and high-effort thought requires clarification in future research. There is widespread consensus on the properties of dual-process thought, but the *mechanisms* underlying these processes remain fiercely debated (for a review see Evans, 2008). Distinctions between automatic and controlled thought have been explained by dual memory systems (Greenwald & Banaji, 1995; Smith & DeCoster, 2000), validation of associations or affective reactions (e.g. Gawronski & Bodenhausen, 2006; Strack & Deutsh 2004), intelligence (e.g., Stanovich, 1999), abstract and concrete processing (e.g., Evans,



2006) and seemingly every combination of these mechanisms. It is therefore unclear whether hierarchy values are viewed as more important in the current research because they are well-learned and embedded in memory or because participants implicitly hold the belief that hierarchy values are positive and important. The specific mechanisms underlying shifts in the importance of hierarchy and equality values cannot yet be determined definitively. Research into value shifts with low-effort thought may help understand why attitudes shift as a function of automatic and controlled thought processing.

The current studies provide evidence that values shift toward hierarchy and away from equality as thought processing becomes shallower. Values underlie attitudes and behaviors (e.g., Bardi & Schwarz, 2003) and it is reasonable to predict that shifts in values will mediate subsequent shifts in attitudes and behaviors as well. The current research was conducted to examine the basic phenomena—whether shifts in values can occur as the result of indirect environmental factors. Future studies should expand this work by using behavioral indicators of values, such as helping behavior or distribution of resources, to examine whether shifts in values under different levels of thought processing shift behavioral expressions of values. This type of research would indicate the boundaries of value shifts based on indirect environmental factors. Since values guide behavior (Schwartz, 1994), it is important to assess whether these temporary environmental factors change only self-reported values or enacted values as well.

## **Conclusions**

The current work provided some good support for the hypothesis that low-effort thought promotes the value of hierarchy and reduces the value of equality. Hierarchy seems to be deeply ingrained, whether due to cultural norms or personal beliefs. It may be difficult to implement egalitarian social and political systems because egalitarianism seems to require greater cognitive

effort. Hierarchy may have a modest, but primary advantage over equality in that it seems to be valued quickly and easily. The current research suggests that values may be difficult to shift, but when low-effort thought is strong enough, they shift toward hierarchy and away from equality.

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## Tables

Table 1

*Hierarchical regression analyses of blood alcohol content and political ideology on equality values in Study 1 (N = 107)*

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Blood Alcohol Content (BAC)	-4.47	1.93	-.22*	-1.42	3.45	-.07
Political Ideology	-.07	.034	-.20*	-.01	.065	-.04
BAC X Political Ideology				-.852	.796	-.24
$R^2$	.087			.097		
Adj $R^2$	.069			.070		
<i>F</i> for change in $R^2$	4.94**			1.15		

*Note* \* $p < 0.05$ , \*\* $p < .01$



Table 2

*Hierarchical regression analyses of blood alcohol content and political ideology on power values in Study 1 (N = 107)*

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Blood Alcohol Content (BAC)	8.95	3.867	.22*	2.83	6.898	.07
Political Ideology	.15	.068	.20*	.03	.130	.04
BAC X Political Ideology				1.70	1.593	.241
$R^2$	.087			.097		
Adj $R^2$	.069			.070		
<i>F</i> for change in $R^2$	4.94**			1.15		

*Note* \* $p < 0.05$ , \*\* $p < .01$

Table 3.

*Means and standard deviations of dependent variables within condition in Study 2*

Measures	Low-Effort Thought		High-Effort Thought	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Achievement	1.05	.78	.96	1.02
Benevolence	-.47	1.34	.07	1.43
Conformity	-1.51	1.83	-1.89	1.75
Hedonism	-.13	1.43	-.29	1.55
Power	-1.03	1.40	-1.81	1.76
Security	1.05	1.00	.88	1.17
Self-Direction	.67	1.08	1.02	.85
Stimulation	.59	.95	.65	.88
Tradition	-.21	1.42	-.18	1.41
Universalism	.01	1.28	.59	1.70
Hierarchy Values Composite	.01	.83	-.43	.94
Equality Values Composite	-.23	.95	.33	1.16
Political Ideology	4.44	2.20	4.35	1.97

Table 4.

*Means and standard deviations of dependent variables within condition in Study 3.*

Measures	Low-Effort Thought		High-Effort Thought		Affective Reaction	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Achievement	.50	1.41	.74	.96	.99	.83
Authority	-.41	1.21	-.81	1.01	-.89	1.33
Benevolence	-.11	1.29	-.24	1.20	-.24	1.18
Conformity	-2.21	1.72	-1.71	2.16	-1.91	1.82
Equality	.75	1.42	.59	1.22	.97	1.18
Freedom	1.32	.92	1.31	1.03	1.39	.95
Hedonism	-.73	1.68	.15	1.49	-.71	1.64
Honoring of Parents and Elders	1.00	.99	.86	1.14	.85	.98
Obedient	.20	1.32	.11	1.40	.55	.99
Power	-1.07	1.49	-1.47	1.68	-1.66	1.71
Security	1.16	.82	1.23	.97	1.16	.96
Self-Direction	.93	1.19	.98	.99	.62	1.35
Social Justice	.39	1.22	.04	1.18	.29	1.29
Social Power	-2.09	1.77	-2.51	1.80	-2.29	1.69
Stimulation	.60	1.15	.51	1.21	.53	1.15
Tradition	-.11	1.89	.04	1.44	.04	1.48
Universalism	-.07	1.19	.11	1.35	-.19	1.52
A World at Peace	-.02	1.73	.08	1.54	.50	1.30
Hierarchy Values	-1.19	1.20	-1.60	1.09	-1.61	1.25
Equality Values	.26	1.00	.20	.89	.39	.78
SDO	2.98	1.13	3.20	1.02	3.08	1.14
PWE	4.61	.51	4.73	.60	4.71	.67
NFC	4.52	.81	4.67	.89	4.58	.79
Political Ideology	5.18	2.00	4.87	2.01	5.17	2.15

Table 5.

*Correlations among dependent variables within condition in Study 3.*

Condition		1	2	3	4	5	6
Low-Effort	1. Hierarchy values	-					
	2. Equality values	-.58***	-				
	3. SDO	.58***	-.69***	-			
	4. PWE	.00	-.04	.16	-		
	5. NFC	-.20	.09	-.07	.23	-	
	6. Political ideology	-.01	-.04	.25	.27	-.18	-
High-Effort	1. Hierarchy values	-					
	2. Equality values	-.48***	-				
	3. SDO	.47**	-.52***	-			
	4. PWE	.24	-.14	.26	-		
	5. NFC	.02	-.06	.20	-.04	-	
	6. Political ideology	.06	-.21	.35*	.48***	.28*	-
Affective Reaction	1. Hierarchy values	-					
	2. Equality values	-.67***	-				
	3. SDO	.41**	-.33*	-			
	4. PWE	.11	-.24	.23	-		
	5. NFC	.17	-.06	.19	.58***	-	
	6. Political ideology	.07	-.18	.31*	.23	.09	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 6.

*Correlations among dependent variables with unstandardized values in Study 3.*

	1	2	3	4	5	6
1. Hierarchy values	-					
2. Equality values	.10	-				
3. SDO	.32***	-.44***	-			
4. PWE	.16	-.01	.22**	-		
5. NFC	.04	.05	.12	.24**	-	
6. Political ideology	.11	-.02	.30***	.32***	.08	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 7.

*Correlations among dependent variables in Study 4: Standardized and unstandardized value measures.*

	1	2	3	4	5	6	7	8	9
1. Hierarchy values	-	-.03	.33***	-.30**	.06	.16	.05	-.05	-.08
2. Equality values	-.50***	-	-.22*	.27**	-.03	-.07	.01	-.02	-.02
3. SDO	.31**	-.35***	-	-.59***	.03	.21*	-.06	-.08	.05
4. HE	-.35***	.34***	-.59***	-	.06	-.11	-.11	-.09	-.17
5. PWE	.02	-.08	.03	.06	-	.12	.08	.17	.11
6. Political ideology	.11	-.16	.21*	-.11	.12	-	-.14	-.07	.02
7. Hierarchy diagram	.07	.01	-.06	-.11	.08	-.14	-	.13	.16
8. Equality diagram	-.01	.02	-.08	-.09	.17	-.07	.13	-	.13
9. Chunked diagram	-.10	-.02	.05	-.17	.11	.02	.16	.13	-

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Correlations with values prior to standardization are presented above the diagonal, and correlations with values after individual mean-centering are presented below the diagonal.

Table 8.

*Correlations among dependent variables within condition in Study 4.*

	1	2	3	4	5	6	7	8	9
1. Hierarchy values	-	-.35**	.21	-.17	.11	.17	.07	-.09	.04
2. Equality values	-.56***	-	-.02	.14	-.21	.07	-.06	-.03	.17
3. SDO	.39**	-.59***	-	-.53***	.07	.09	.10	-.08	.07
4. HE	-.55***	.55***	-.69***	-	.02	.05	-.23	-.21	-.27*
5. PWE	-.08	.05	-.01	.18	-	.25	-.18	.08	-.01
6. Political ideology	.08	-.32*	.32*	-.32*	-.05	-	-.32*	-.10	-.04
7. Hierarchy diagram	.07	.09	-.22	.06	.06	.05	-	-.01	.23
8. Equality diagram	.04	.07	-.07	.07	.30*	-.03	.29*	-	.21
9. Chunked diagram	-.19	-.13	.03	-.06	.26	.07	.09	.06	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Correlations for Ego Depletion ( $n = 57$ ) are presented above the diagonal, and correlations for Control ( $n = 53$ ) are presented below the diagonal.

Table 9.

*Means and standard deviations of dependent variables within conditions in Study 4*

Measure	Ego Depletion		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Achievement	.98	1.16	.94	1.22
Authority	-.65	1.29	-1.16	1.59
Benevolence	-.16	1.58	-.32	1.75
Conformity	-1.81	1.75	-2.06	1.53
Hedonism	-.85	1.62	-1.04	1.61
Power	-1.79	1.46	-1.48	1.66
Security	1.24	1.07	1.20	.99
Self-Direction	.91	1.14	1.24	1.10
Stimulation	.79	1.04	.90	.87
Universalism	.68	1.21	.58	1.61
Hierarchy Values Composite	-.38	.73	-.27	1.10
Equality Values Composite	-.26	.89	.14	1.27
SDO	3.10	1.13	2.90	1.24
PWE	4.42	.67	4.53	.46
Humanitarianism-Egalitarianism	5.30	1.23	5.16	.96
Hierarchy Diagram	3.42	1.14	3.62	1.05
Equality Diagram	3.95	1.24	4.08	1.24
Chunked Diagram	4.19	1.04	4.25	1.27



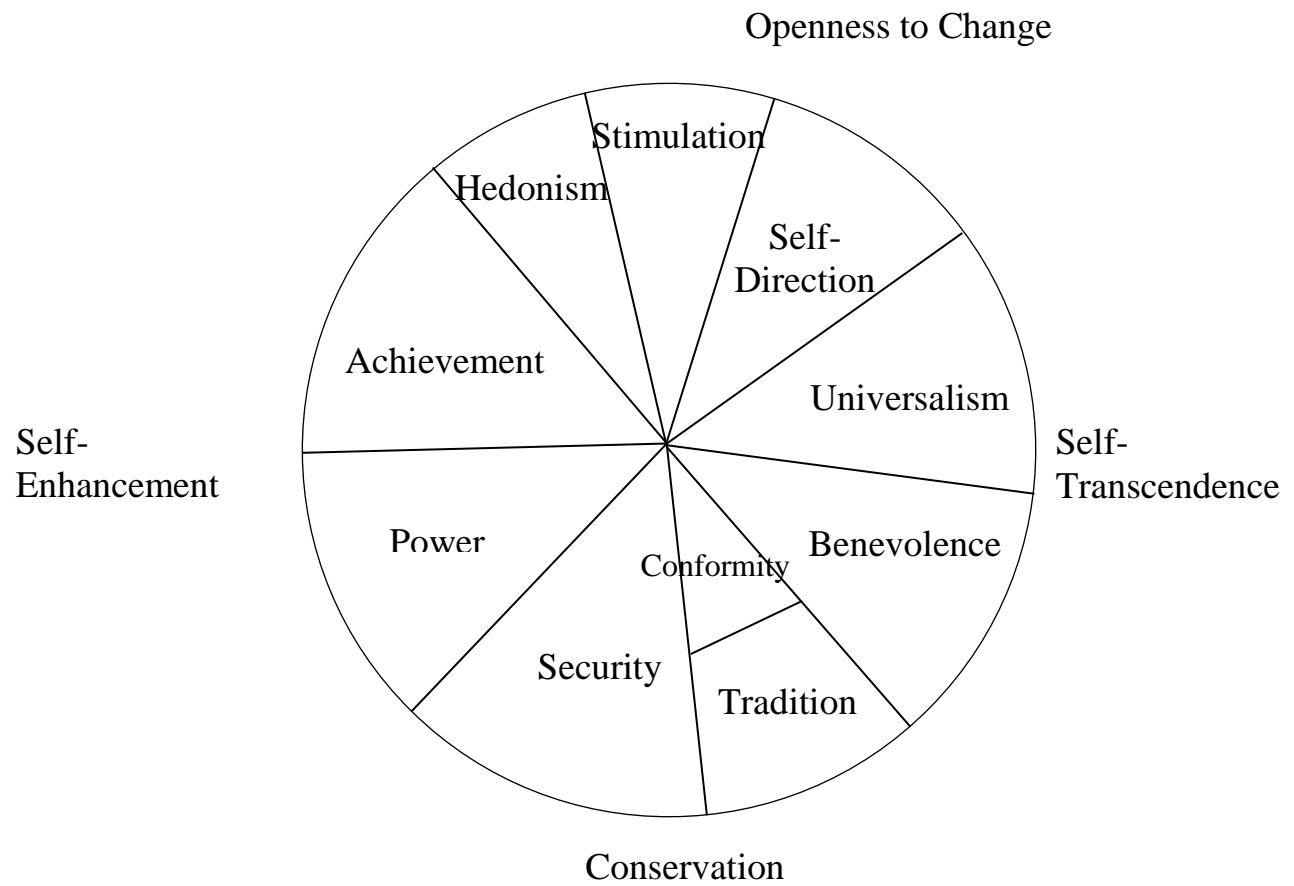
**Figures**

Figure 1.

Schwartz's theoretical structure of values

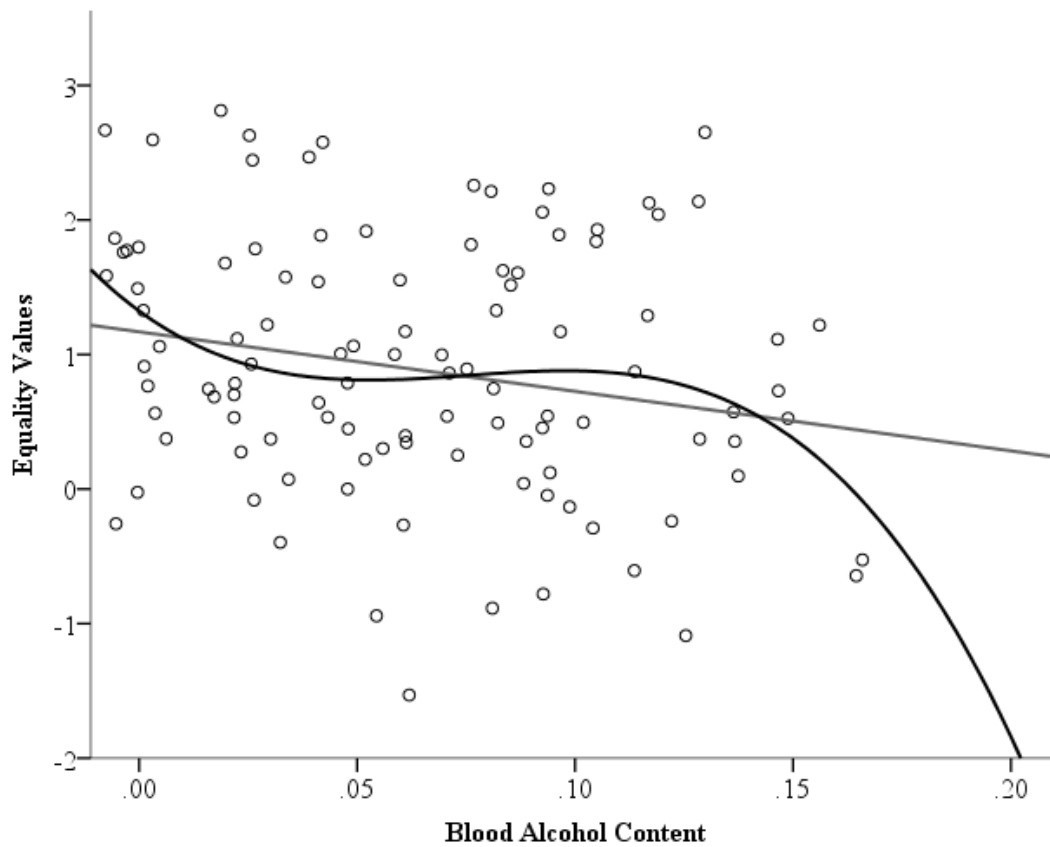


Figure 2.

*Regression of equality values on blood alcohol content: Linear and cubic trends*

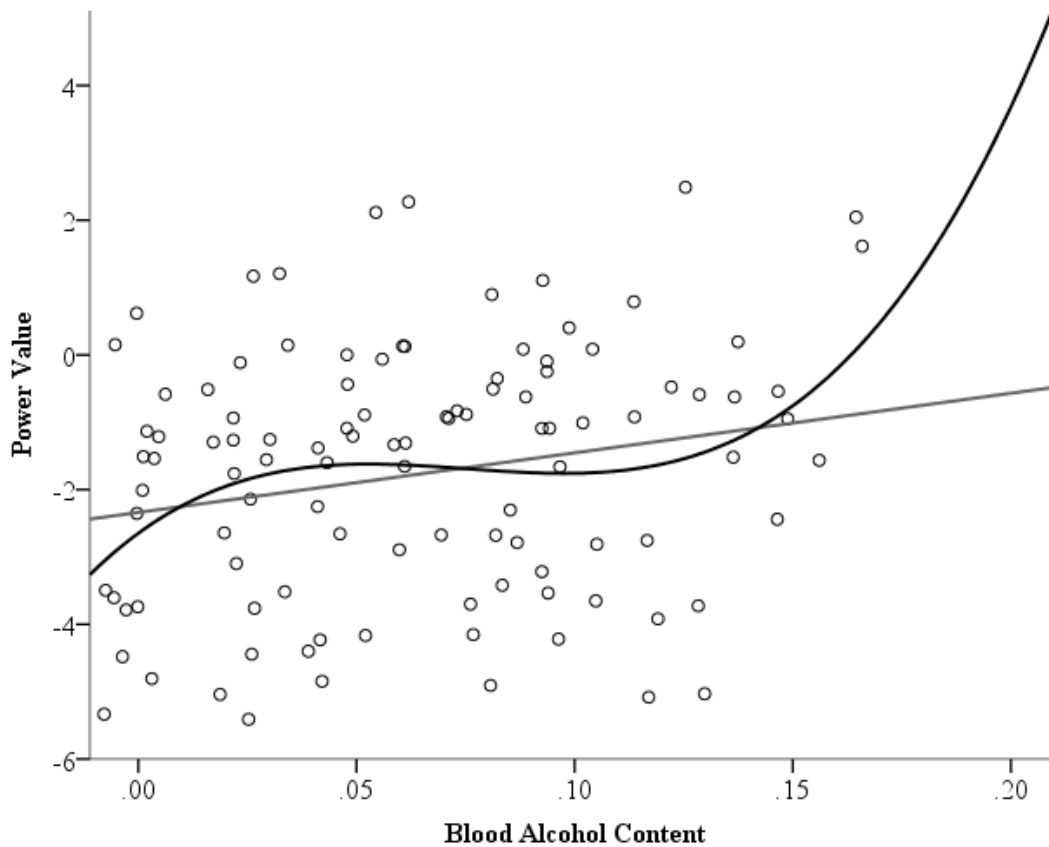


Figure 3.

*Regression of power values on blood alcohol content: Linear and cubic trends*

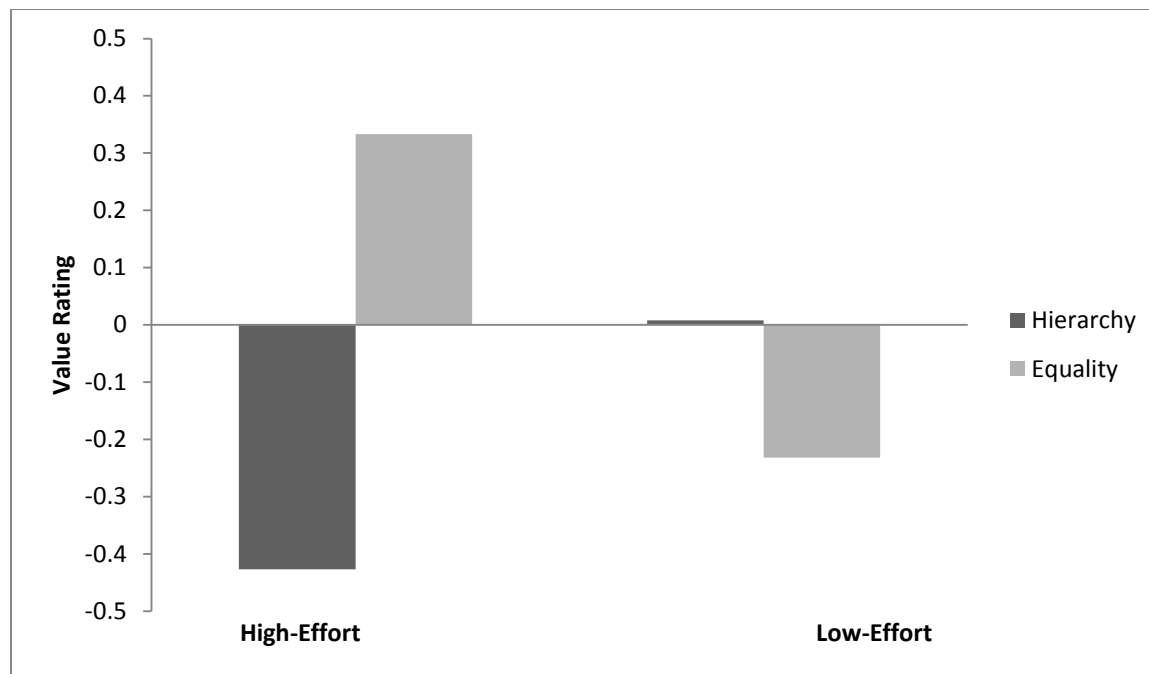


Figure 4.

*Effects of low-effort and high-effort thought on values in Study 2*

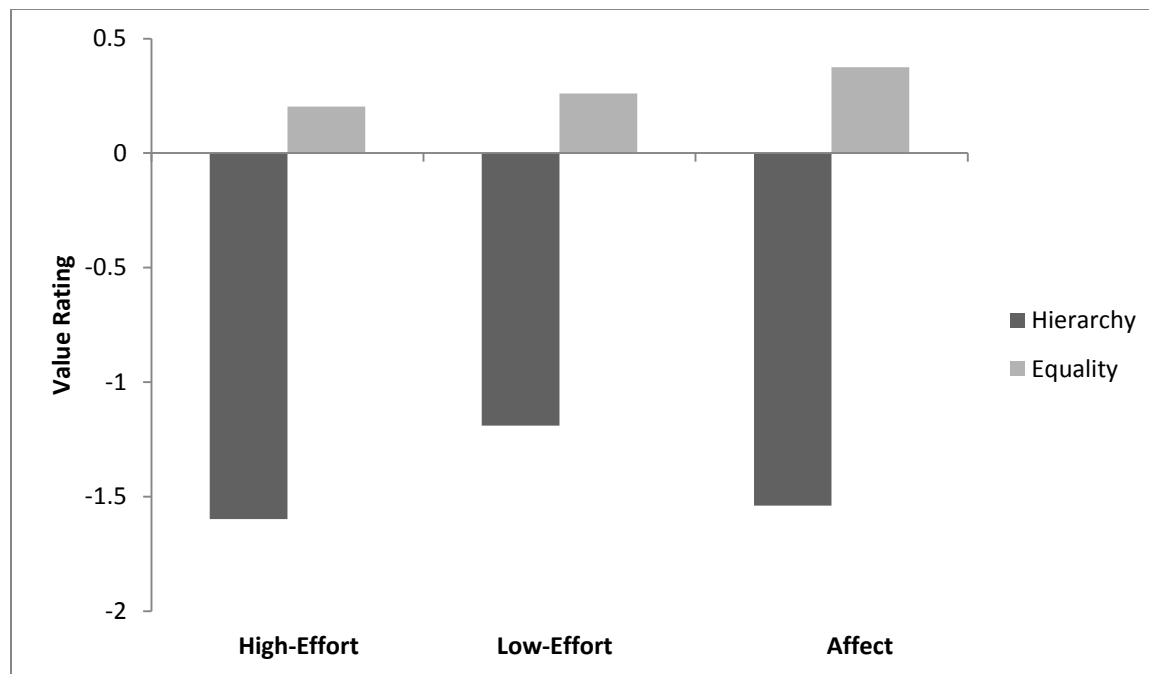


Figure 5.

*Effects of low-effort and high-effort thought on values in Study 3*

## Appendix A Values Pilot Test

**INSTRUCTIONS:** Please rate the extent to which you believe the listed values are associated with *hierarchy* or *equality* using the scale provided. There are no right or wrong answers and neither hierarchy nor equality are necessarily good or bad. We simply wish to see how important values are related to the concepts of hierarchy and equality.

1	2	3	4	5
<b>Hierarchy</b>		<b>Neither Hierarchy or Equality</b>		<b>Equality</b>

- \_\_\_\_\_ **Self-Direction.** Independent thought and action; choosing, creating, exploring.
- \_\_\_\_\_ **Stimulation.** Excitement, novelty, and challenge in life.
- \_\_\_\_\_ **Hedonism.** Pleasure and sensuous gratification for oneself.
- \_\_\_\_\_ **Achievement.** Personal success through demonstrating competence according to social standards.
- \_\_\_\_\_ **Power.** Social status and prestige, control or dominance over people and resources.
- \_\_\_\_\_ **Security.** Safety, harmony, and stability of society, of relationships, and of self.
- \_\_\_\_\_ **Conformity.** Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
- \_\_\_\_\_ **Tradition.** Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self.
- \_\_\_\_\_ **Benevolence.** Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
- \_\_\_\_\_ **Universalism.** Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

## Appendix B

### Study 1 Schwartz Values

Researchers from the KU Psychology Department are interested in your attitudes and values. On the values below, *please rate how important each value is for you as a guiding principle in your life.*

<i>Opposed To My Values</i>	<i>Low</i>	<i>Very Important</i>	
-1 0 1 2 3 4 5 6 7			<b>Benevolence.</b> Preserving and improving the welfare of people you see a lot and know very well (the ‘in-group’).
-1 0 1 2 3 4 5 6 7			<b>Power.</b> Social status and prestige, control or dominance over people and resources.
-1 0 1 2 3 4 5 6 7			<b>Universalism.</b> Understanding, appreciation, tolerance, and protection for the welfare of <i>all</i> people and for all of nature.





## Appendix D

### Study 2 Schwartz Values

The following is a lists of values, each in alphabetical order. Each value is accompanied by a short description. **Your task is to rate how important each value is for you as a guiding principle in your life.** The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life. -1 is for rating any values opposed to the principles that guide you. 7 is for rating a value of supreme importance as a guiding principle in your life: *ordinarily there are no more than two such values (SVS)*. Study each list and think of how much each value may act as a guiding principle in your life.

-1	0	1	2	3	4	5	6	7	
Opposed To My Values	Not Important			Important			Very Important	Of Supreme Importance	
-1	0	1	2	3	4	5	6	7	<b>Self-Direction.</b> Independent thought and action; choosing, creating, exploring.
-1	0	1	2	3	4	5	6	7	<b>Stimulation.</b> Excitement, novelty, and challenge in life.
-1	0	1	2	3	4	5	6	7	<b>Hedonism.</b> Pleasure and sensuous gratification for oneself.
-1	0	1	2	3	4	5	6	7	<b>Achievement.</b> Personal success through demonstrating competence according to social standards.
-1	0	1	2	3	4	5	6	7	<b>Power.</b> Social status and prestige, control or dominance over people and resources.
-1	0	1	2	3	4	5	6	7	<b>Security.</b> Safety, harmony, and stability of society, of relationships, and of self.
-1	0	1	2	3	4	5	6	7	<b>Conformity.</b> Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
-1	0	1	2	3	4	5	6	7	<b>Tradition.</b> Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self.
-1	0	1	2	3	4	5	6	7	<b>Benevolence.</b> Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
-1	0	1	2	3	4	5	6	7	<b>Universalism.</b> Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

## Appendix E

### Study 3 Schwartz Values

The following is a list of values, each in alphabetical order. Each value is accompanied by a short description. **Your task is to rate how important each value is for you as a guiding principle in your life.** The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life. -1 is for rating any values opposed to the principles that guide you. 7 is for rating a value of supreme importance as a guiding principle in your life: *ordinarily there are no more than two such values* (SVS). Study each list and think of how much each value may act as a guiding principle in your life.

When you have completed the ranking of both sets of values, the result should represent an accurate picture of how you really feel about what's important in your life.

- |                    |  |
|--------------------|--|
| -1 0 1 2 3 4 5 6 7 | <b>Achievement.</b> Personal success through demonstrating competence according to social standards.   |
| -1 0 1 2 3 4 5 6 7 | <b>Authority.</b> The right to lead or command.  |
| -1 0 1 2 3 4 5 6 7 | <b>Benevolence.</b> Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').            |
| -1 0 1 2 3 4 5 6 7 | <b>Conformity.</b> Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms. |
| -1 0 1 2 3 4 5 6 7 | <b>Equality.</b> Equal opportunity for all   |
| -1 0 1 2 3 4 5 6 7 | <b>Freedom.</b> Freedom of action and thought  |
| -1 0 1 2 3 4 5 6 7 | <b>Hedonism.</b> Pleasure and sensuous gratification for oneself.  |
| -1 0 1 2 3 4 5 6 7 | <b>Honoring of Parents and Elders.</b> Showing respect.  |
| -1 0 1 2 3 4 5 6 7 | <b>Obedient.</b> Dutiful, meeting obligations.   |
| -1 0 1 2 3 4 5 6 7 | <b>Power.</b> Social status and prestige, control or dominance over people and resources.  |
| -1 0 1 2 3 4 5 6 7 | <b>Security.</b> Safety, harmony, and stability of society, of relationships, and of self.   |
| -1 0 1 2 3 4 5 6 7 | <b>Self-Direction.</b> Independent thought and action; choosing, creating, exploring.  |
| -1 0 1 2 3 4 5 6 7 | <b>Social Justice.</b> Correcting injustice, care for the weak   |
| -1 0 1 2 3 4 5 6 7 | <b>Social Power.</b> Control over others, dominance.   |

-1 0 1 2 3 4 5 6 7

**Stimulation.** Excitement, novelty, and challenge in life.

-1 0 1 2 3 4 5 6 7

**Tradition.** Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self.

-1 0 1 2 3 4 5 6 7

**Universalism.** Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

-1 0 1 2 3 4 5 6 7

**A World at Peace.** Free of war and conflict

## Appendix F

### Social Dominance Orientation

INSTRUCTIONS: Below are a series of statements with which you may either agree or disagree. For each statement, please indicate the degree of your agreement/disagreement by selecting the appropriate node. Remember that your first response is usually the most accurate.

1	2	3	4	5	6	7
Very Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Moderately Agree	Very Strongly Agree

Disagree	Agree	
1 2 3 4 5 6 7		Some groups of people are simply inferior to other groups.
1 2 3 4 5 6 7		In getting what you want, it is sometimes necessary to use force against other groups.
1 2 3 4 5 6 7		It's OK if some groups have more of a chance in life than others.
1 2 3 4 5 6 7		To get ahead in life, it is sometimes necessary to step on other groups.
1 2 3 4 5 6 7		If certain groups stayed in their place, we would have fewer problems.
1 2 3 4 5 6 7		It's probably a good thing that certain groups are at the top and other groups are at the bottom.
1 2 3 4 5 6 7		Inferior groups should stay in their place.
1 2 3 4 5 6 7		Sometimes other groups must be kept in their place.
1 2 3 4 5 6 7		It would be good if groups could be equal.
1 2 3 4 5 6 7		Group equality should be our ideal.
1 2 3 4 5 6 7		All groups should be given an equal chance in life.
1 2 3 4 5 6 7		We should do what we can to equalize conditions for different groups.
1 2 3 4 5 6 7		Increased social equality.
1 2 3 4 5 6 7		We would have fewer problems if we treated people more equally.
1 2 3 4 5 6 7		We should strive to make incomes as equal as possible.
1 2 3 4 5 6 7		No one group should dominate in society.

## Appendix G Protestant Work Ethic

INSTRUCTIONS: Below are a series of statements with which you may either agree or disagree. For each statement, please indicate the degree of your agreement/disagreement using the following scale:

1	2	3	4	5	6	7
Very	Moderately	Slightly	Neither	Slightly	Moderately	Very
Strongly	Disagree	Disagree	Agree	Agree	Agree	Strongly
Disagree			or			Agree
			Disagree			

**Disagree**                      **Agree**

1 2 3 4 5 6 7

Most people spend too much time in unprofitable amusements

1 2 3 4 5 6 7

Our society would have fewer problems if people had less leisure time

1 2 3 4 5 6 7

Money acquired easily (e.g., through gambling or speculation) is usually spent unwisely

1 2 3 4 5 6 7

There are few satisfactions equal to the realization that one has done their best at a job

1 2 3 4 5 6 7

The most difficult college courses usually turn out to be the most rewarding

1 2 3 4 5 6 7

Most people who don't succeed in life are just plain lazy

1 2 3 4 5 6 7

The self-made person is likely to be more ethical than the person born to wealth

1 2 3 4 5 6 7

I often feel I would be more successful if I sacrificed certain pleasures

1 2 3 4 5 6 7

People should have more leisure time to spend in relaxation

1 2 3 4 5 6 7

Any person who is able and willing to work hard has a good chance of succeeding

1 2 3 4 5 6 7

People who fail at a job have usually not tried hard enough

1 2 3 4 5 6 7

Life would have very little meaning if we never had to suffer

1 2 3 4 5 6 7

Hard work offers little guarantee of success

1 2 3 4 5 6 7

The credit card is a ticket to careless spending

1 2 3 4 5 6 7

Life would be more meaningful if we had more leisure time

1 2 3 4 5 6 7

The person who can approach an unpleasant task with enthusiasm is the person who gets ahead

1 2 3 4 5 6 7

If one works hard enough they are likely to make a good life for themselves

1 2 3 4 5 6 7

I feel uneasy when there is little work for me to do

1 2 3 4 5 6 7

A distaste for hard work usually reflects a weakness of character

## Appendix H Need for Closure

Please rate your level of agreement with each of the following statements.

	1	2	3	4	5	6	7	
	Very Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Moderately Agree	Very Strongly Agree	
	<b>Disagree</b>						<b>Agree</b>	
	1	2	3	4	5	6	7	I don't like situations that are uncertain.
	1	2	3	4	5	6	7	I dislike questions that could be answered in many different ways.
	1	2	3	4	5	6	7	I find that a well-ordered life with regular hours suits my temperament.
	1	2	3	4	5	6	7	I feel uncomfortable when I don't understand the reason why an event occurred in my life.
	1	2	3	4	5	6	7	I feel irritated when one person disagrees with what everyone else in a group believes.
	1	2	3	4	5	6	7	I don't like to go into a situation without knowing what I can expect from it.
	1	2	3	4	5	6	7	When I have made a decision, I feel relieved.
	1	2	3	4	5	6	7	When I am confronted with a problem, I'm dying to reach a solution very quickly.
	1	2	3	4	5	6	7	I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
	1	2	3	4	5	6	7	I don't like to be with people who are capable of unexpected actions.
	1	2	3	4	5	6	7	I dislike it when a person's statement could mean many different things.
	1	2	3	4	5	6	7	I find that establishing a consistent routine enables me to enjoy life more.
	1	2	3	4	5	6	7	I enjoy having a clear and structured mode of life.
	1	2	3	4	5	6	7	I do not usually consult many different opinions before forming my own view.
	1	2	3	4	5	6	7	I dislike unpredictable situations.

**Appendix I**  
**Anagram Task**

Control Task:

<b>Word</b>	<b>Solution</b>
BGU	BUG
OHKO	HOOK
NGLO	LONG
BNTE	BENT
AKS	ASK
EBFE	BEEF
ALFT	FLAT
HGUE	HUGE
BDE	BED
RPRU	PURR

Ego Depletion Task:

<b>Word</b>	<b>Solution</b>
LUYGIT	GUILTY
SEELAW	WEASEL
GACNEY	AGENCY
HEHNPY	HYPHEN
EVCTO	COVET
ROUNCK	UNCORK
FIDARA	AFRAID
EGKAST	GASKET
FIMRON	INFORM
CAFEED	DEFACE
ONECI	unsolvable

## Appendix J

### Study 4 Schwartz Values

The following is a lists of values, each in alphabetical order. Each value is accompanied by a short description. **Your task is to rate how important each value is for you as a guiding principle in your life.** The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life. -1 is for rating any values opposed to the principles that guide you. 7 is for rating a value of supreme importance as a guiding principle in your life: *ordinarily there are no more than two such values (SVS)*. Study each list and think of how much each value may act as a guiding principle in your life.

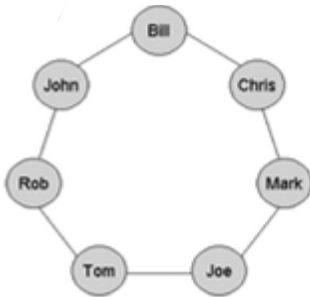
-1	0	1	2	3	4	5	6	7	
Opposed To My Values	Not Important			Important			Very Important	Of Supreme Importance	
-1	0	1	2	3	4	5	6	7	<b>Achievement.</b> Personal success through demonstrating competence according to social standards.
-1	0	1	2	3	4	5	6	7	<b>Authority.</b> The right to lead or command.
-1	0	1	2	3	4	5	6	7	<b>Benevolence.</b> Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
-1	0	1	2	3	4	5	6	7	<b>Conformity.</b> Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
1	0	1	2	3	4	5	6	7	<b>Hedonism.</b> Pleasure and sensuous gratification for oneself.
-1	0	1	2	3	4	5	6	7	<b>Power.</b> Social status and prestige, control or dominance over people and resources.
-1	0	1	2	3	4	5	6	7	<b>Security.</b> Safety, harmony, and stability of society, of relationships, and of self.
-1	0	1	2	3	4	5	6	7	<b>Self-Direction.</b> Independent thought and action; choosing, creating, exploring.
-1	0	1	2	3	4	5	6	7	<b>Stimulation.</b> Excitement, novelty, and challenge in life.
-1	0	1	2	3	4	5	6	7	<b>Universalism.</b> Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.



## Appendix K

### Visual Representations of Hierarchy

Below are a series of statements with which you may either agree or disagree. For each statement, please indicate the degree of your agreement/disagreement using the following scale:



How much do you like or dislike the diagram?

1	2	3	4	5	6	7
Strongly Dislike						Strongly Like

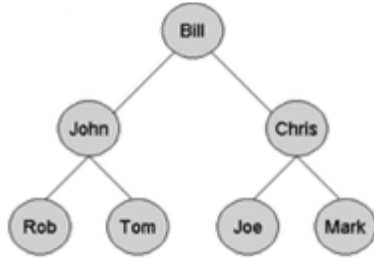
How efficient or inefficient is this relationship between people?

1	2	3	4	5	6	7
Very Inefficient						Very Efficient

How much do the people in the diagram benefit or suffer from this relationship?

1	2	3	4	5	6	7
Benefit Significantly						Suffer Significantly





How much do you like or dislike the diagram?

1                      2                      3                      4                      5                      6                      7  
 Strongly                      Dislike                      Strongly  
 Dislike                      Like

How efficient or inefficient is this relationship between people?

1                      2                      3                      4                      5                      6                      7  
 Very                      Inefficient                      Very  
 Inefficient                      Efficient

How much do the people in the diagram benefit or suffer from this relationship?

1                      2                      3                      4                      5                      6                      7  
 Benefit                      Suffer  
 Significantly                      Significantly

## Appendix L Humanitarianism-Egalitarianism Scale

**INSTRUCTIONS:** Below are a series of statements with which you may either agree or disagree. For each statement, please indicate the degree of your agreement/disagreement by selecting the appropriate node. Remember that your first response is usually the most accurate.

1	2	3	4	5	6	7
Very Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Moderately Agree	Very Strongly Agree

<b>Disagree</b>	<b>Agree</b>	
1 2 3 4 5 6 7		One should be kind to all people
1 2 3 4 5 6 7		One should find ways to help others less fortunate than oneself
1 2 3 4 5 6 7		A person should be concerned about the well-being of others
1 2 3 4 5 6 7		There should be equality for everyone – because we are all human beings
1 2 3 4 5 6 7		Those who are unable to provide for their basic needs should be helped by others.
1 2 3 4 5 6 7		A good society is one in which people feel responsible for one another
1 2 3 4 5 6 7		Everyone should have an equal chance and an equal say in most things
1 2 3 4 5 6 7		Acting to protect the rights and interests of other members of the community is a major obligation for all persons.
1 2 3 4 5 6 7		In dealing with criminals the courts should recognize that many are victims of circumstances.
1 2 3 4 5 6 7		Prosperous nations have a moral obligation to share some of their wealth with poor nations.

### Appendix M Positive and Negative Affect Schedule

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
Very Slightly or Not at All	A little	Moderately	Quite a bit	Extremely

1 2 3 4 5	Active
1 2 3 4 5	Enthusiastic
1 2 3 4 5	Determined
1 2 3 4 5	Attentive
1 2 3 4 5	Inspired
1 2 3 4 5	Strong
1 2 3 4 5	Interested
1 2 3 4 5	Alert
1 2 3 4 5	Excited
1 2 3 4 5	Proud
1 2 3 4 5	Afraid
1 2 3 4 5	Nervous
1 2 3 4 5	Scared
1 2 3 4 5	Upset
1 2 3 4 5	Guilty
1 2 3 4 5	Hostile
1 2 3 4 5	Ashamed
1 2 3 4 5	Jittery
1 2 3 4 5	Irritable
1 2 3 4 5	Distressed