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Inclusion of the environment in the self: Linking values to pro-environmental behaviors

A dissertation submitted in partial satisfaction of the requirements for

the degree Doctor of Philosophy in Psychological and Brain Sciences

by

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EDUCATION

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PUBLICATIONS

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1. **Ehret, P. J.**, & Sherman, D. K. (In press). Reducing college student drinking by integrating self-affirmation and implementation intentions. *Annals of Behavioral Medicine.*

2. Van Boven, L., **Ehret, P. J.**, & Sherman, D. K. (In press). Psychological barriers to public support for climate policy. *Perspectives on Psychological Science.*

3. Van Boven, L., **Ehret, P. J.**, & Sherman, D. K. (In press). Towards surmounting the psychological barriers to climate policy: Appreciating contexts and acknowledging challenges (comment on Weber, 2018). *Perspectives on Psychological Science.*

4. **Ehret, P. J.**, Van Boven, L., & Sherman, D. K. (2018). Partisan barriers to bipartisanship: Understanding climate policy polarization. *Social Psychological and Personality Science.* Advanced online publication.
   Paper awarded APA Division 34's Graduate Student Research Award for outstanding original research

5. **Ehret, P. J.**, Sparks, A., & Sherman, D. K. (2017). Support for environmental protection: An integration of ideological-consistency and information-deficit models. *Environmental Politics, 26*(2), 253-277.

6. Brick, C., McCully, S. N., Updegraff, J. A., **Ehret, P. J.**, Areguin, M.*****, & Sherman, D. K. (2016). The impact of cultural exposure and message framing on oral health behavior: Exploring the role of message memory. *Medical Decision Making, 36*(7), 834-843

7. **Ehret, P. J.**, LaBrie, J. W., Santerre, C., & Sherman, D. K. (2015). Self-Affirmation and Motivational Interviewing (SAMI): Integrating perspectives to reduce resistance and increase efficacy of alcohol interventions. *Health Psychology Review*, *9*(1), 83-102.

8. **Ehret, P. J.**, Monroe, B. M., & Read, S. J. (2015). Modeling the dynamics of evaluation: A multilevel neural network implementation of the iterative reprocessing model. *Personality and Social Psychology Review, 19*(2), 148-176.

9. **Ehret, P. J.**, & Sherman, D. K. (2014). Public policy and health: A self-affirmation perspective. *Policy Insights from Behavioral and Brain Sciences, 1*(1), 222-230.

10. Hummer, J. F., LaBrie, J. W., Grant, S. P., Lac, A., & **Ehret, P. J.** (2014). The role of assessment environment on self-reported alcohol use and perceived group norms: Comparing web-based surveys to a group setting involving handheld keypads. *Drugs: Education, Prevention, and Policy, 21*(2), 147-156.

11. LaBrie, J. W., **Ehret, P. J.**, & Hummer, J. F. (2013). Are they all the same? An exploratory, categorical analysis of drinking game types. *Addictive Behaviors, 38*(5), 2133-2139.

12. **Ehret, P. J.**, Ghaidarov, T. M., & LaBrie, J. W. (2013). Can you say no?: The impact of drink refusal self-efficacy on the relationship between protective behavioral strategies and drinking outcomes. *Addictive Behaviors, 38*(4), 1898-1904.

13. Hummer, J. F., LaBrie, J. W., & **Ehret, P. J.** (2013). Do as I say, not as you perceive: Examining the roles of perceived parental knowledge and perceived parental approval in college students' alcohol-related approval and behavior. *Parenting: Science and Practice, 13*(3), 196-212.

14. Hummer, J. F., Napper, L. E., **Ehret, P. J.**, & LaBrie, J. W. (2013). Event-specific risk and ecological factors associated with prepartying among heavier drinking college students. *Addictive Behaviors, 38*(3), 1620-1628.

15. **Ehret, P. J.**, LaBrie, J. W., & Hummer, J. F. (2012). I can play all night: Examining the relationship between perceived tolerance and drinking game alcohol consumption. *Substance Use and Misuse, 47*(12), 1318-1327.

16. LaBrie, J. W., **Ehret, P. J.**, Hummer, J. F., & Prenovost, K. (2012). Poor adjustment to college life mediates the relationship between drinking motives and alcohol consequences: A look at college adjustment, drinking motives, and drinking outcomes. *Addictive Behaviors, 37*(4), 379-386.

17. LaBrie, J. W., Hummer, J. F., Prenovost, K., **Ehret, P. J.**, & Kenney, S. (2011). Parents know best but are they accurate? Parental normative misperceptions and their relationship to students' alcohol-related outcomes. *Journal of Studies on Alcohol and Drugs, 72*(4), 521-529.

FELLOWSHIPS AND AWARDS

2018	***Awardee,*** UCSB Psychological & Brain Sciences McClintock Award for scholarship, education, and service
2018	***Awardee,*** APA Division 34 Graduate Student Research Award
2017	***Awardee,*** UCSB Psychological & Brain Sciences Statistics Fellow
2017	***Awardee,*** UCSB Fiona & Michael Goodchild Graduate Mentoring Award
2017	***Awardee,*** UCSB Brython Davis Graduate Fellowship
2016	***Awardee,*** Behavior, Energy, and Climate Change Conference Precourt Fellowship
2013 - 2018	***Awardee,*** National Science Foundation Graduate Research Fellowship
2013 - 2014	***Awardee,*** UCSB Crossroads Graduate Fellowship
2012 - 2014	***Awardee,*** University of California Regents Special Fellowship
2010	***Awardee,*** *Magna cum laude*, Renaissance Scholar, Order of the Laurel and Palm, *USC's highest honor, recognizing 24 graduating seniors for excellence in scholarship, leadership, and service*

REPORTS

1. **Ehret, P. J.,** Kuehl, C., Hodges, H., Brick, C., & Anderson, S. (2015). *Saving Goleta's water: Behavioral strategies for encouraging household water conservation.* Report prepared for the Goleta Water District, Goleta, CA.

2. **Ehret, P. J.** (2014). *SAGE Center Forum on Social Psychological Interventions.* SAGE Center for the Study of the Mind, Santa Barbara, CA. https://www.sagecenter.ucsb.edu/node/396

PROFESSIONAL PRESENTATIONS

*Student Advisee

1. **Ehret, P. J.**, Van Boven, L., & Sherman, D. K. (2017, October). *Partisan barriers to bipartisanship: Understanding policy support of Washington State's carbon tax initiative.* Talk presented at the 11th annual Behavior, Energy, and Climate Change Conference, Sacramento, CA.

2. **Ehret, P. J.**, Van Boven, L., & Sherman, D. K. (2017, September). *Partisan barriers to bipartisanship: Placing party over policy with Washington State's carbon tax initiative.* Talk presented at the Colorado Climate Retreat, Boulder, CO.

3. **Ehret, P. J.**, Badea, C., Sherman, D. K., & Boza, M. (2017, January). *Group-affirmation, normative context, and attitudes against the Roma Minority in Romania*. Poster presented at the 18th annual meeting of the Society for Personality and Social Psychology, San Antonio, TX.

4. Ortosky, L. E., **Ehret, P. J.**, & Sherman, D. K. (2017, January). *Uncertainty verification and support for presidential candidates*. Poster presented at the 18th annual Self and Identity Pre-Conference at the Society for Personality and Social Psychology, San Antonio, TX.
   - *Awarded best poster, Self & Identity Pre-Conference*

5. **Ehret, P. J.**, Van Boven, L., & Sherman, D. K. (2016, October). *Psychological barriers to bipartisan public support for carbon pricing policy.* Talk presented at the 10th annual Behavior, Energy, and Climate Change Conference, Baltimore, MD.

6. Enders, C. A.*****, **Ehret, P. J.**, & Sherman, D. K. (2016, January). *Do you act like a Green Gaucho? An exploration of social identity and pro-environmental behavior*. Poster presented at the 5th annual Sustainable Psychology Pre-Conference at the Society for Personality and Social Psychology, San Diego, CA.

7. **Ehret, P. J.**, Sparks, A., & Sherman, D. K. (2016, January). *Integrating ideological-consistency and information-deficit models to predict environmental support.* Poster presented at the 5th annual Sustainable Psychology Pre-Conference at the Society for Personality and Social Psychology, San Diego, CA.

8. **Ehret, P. J.** (2016, January). *Using zero-inflated negative binomial regressions to model drinking data from a social psychological intervention.* Invited presentation at UCSB's Quantitative Methods in the Social Sciences Colloquium, Santa Barbara, CA.

9. **Ehret, P. J.** & Sherman, D. K. (2016, January). *Integrating interventions: A combined self-affirmation and implementation intentions intervention decreases drinking among college students.* Poster presented at the 17th annual meeting of the Society for Personality and Social Psychology, San Diego, CA.

10. **Ehret, P. J.** (2015, August). *Understanding water conservation behavior: What social science and behavioral economics can tell us.* Invited presentation at the quarterly San Gabriel Valley Water Association meeting, Whittier, CA.

11. **Ehret, P. J.**, Sparks, A., & Sherman, D. K. (2015, June). *Who goes green? The interaction of ideology and education on environmental support.* Paper presented at the 3rd annual UCSB Environmental Politics Conference, Santa Barbara, CA.

12. **Ehret, P. J.**, & Sparks, A. (2014, April). *Pro-life, pro-guns, pro-…environment?: Examining the green conservative.* Paper presented at the 72nd annual conference of the Midwest Political Science Association, Chicago, IL.

13. **Ehret, P. J.**, & Sherman, D. F. (2014, February). *Invoking the green identity: Can it motivate increased environmentally sustainable behavioral intentions?* Data blitz presented at the 3rd annual Sustainable Psychology Pre-Conference at the Society for Personality and Social Psychology, Austin, TX.

14. **Ehret, P. J.**, & Sherman, D. K. (2014, February). *Feeling safe, feeling efficacious: Exploring how public and membership collective self-esteem lead to increased safety self-efficacy*. Poster presented at the 15th annual meeting of the Society for Personality and Social Psychology, Austin, TX.

15. Schembari, B. C., Lento, R. M., Newcomer, A. R., **Ehret, P. J.**, & Goeke-Morey, M. C. (2013, November). *The influence of sexual trauma and age of onset of risky behaviors on suicidal behaviors among U.S. high school students.* Poster presented at the 29th annual International Society for Traumatic Stress Studies conference, Philadelphia, PA.

16. **Ehret, P. J.**, & LaBrie, J. W. (2013, January). *Dressing up and partying down: Sex differences and the influence of theme party drinking norms.* Data blitz presented at the 3rd annual Social Personality and Health Network Pre-Conference at the Society for Personality and Social Psychology, New Orleans, LA.

17. **Ehret, P. J.**, & LaBrie, J. W. (2012, June). *Drinking until you win: The impact of perceived tolerance and drinking game type on maximum in-game alcohol consumption*. Poster presented at the 35th annual meeting of the Research Society on Alcoholism and abstract published in *Alcoholism: Clinical and Experimental Research, 36,* 225A.

18. **Ehret, P. J.**, Ghaidarov, T. M., LaBrie, J. W., & Andere, E*****. (2012, June). *Can you say no?: Examining the relationship between drinking refusal self-efficacy and protective behavioral strategy use on alcohol outcomes*. Poster presented at the 35th annual meeting of the Research Society on Alcoholism and abstract published in *Alcoholism: Clinical and Experimental Research, 36,* 132A.

19. Hummer, J. F., Napper, L. E**., Ehret, P. J.**, & LaBrie, J. W. (2012, June). *Event-specific risk and ecological factors associated with prepartying among heavier drinkers*. Poster presented at the 35th annual meeting of the Research Society on Alcoholism and abstract published in *Alcoholism: Clinical and Experimental Research, 36,* 136A.

20. Read, S. J., & **Ehret, P. J.** (2011, August). *Overriding racial stereotypes: A multilevel neural network implementation of the iterative reprocessing model of social evaluation*. Reviewed paper presented at the 2011 International Joint Conference on Neural Networks, San Jose, CA.

21. **Ehret, P. J.**, Hummer J., & LaBrie, J.W. (2011, April). *Coping and conformity drinking motives mediate the relationship between college adjustment and alcohol-related consequences*. Poster presentation at the 91st annual convention of the Western Psychological Association, Los Angeles, CA.

22. Hummer, J. F., Neighbors, C., LaBrie, J. W., Lewis, M. A., Lee, C. M., Desai, S., Kilmer, J. R., Larimer, M. E., & **Ehret, P. J.** (2010, November). *Group identification as a moderator of the relationship between perceived social norms and alcohol consumption*. Poster presented at the 44th annual convention of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

23. Read, S. J., & **Ehret, P. J.** (2010, October). *He's black?! But he's also a doctor: A neural network implementation of the iterative reprocessing model of racial stereotype evaluations*. Presentation at the 4th annual meeting of the Social and Affective Neuroscience Society, Chicago, IL.

TEACHING EXPERIENCE

Introductory Psychology *Undergraduate course* *Section Lecturer*	Summer 2015: Led lecture for three sections of 23-40 students, designed lecture content and activities, and prepared test materials
Honors Seminar *Undergraduate course* *Guest Lecturer*	Spring 2017
Sustainability Psychology *Undergraduate course* *Guest Lecturer &* *Teaching Assistant*	Spring 2015
Clinical Psychology *Graduate course* *Guest Lecturer*	Winter 2016

UNDERGRADUATE MENTORING

2015 - 2016	Katherine Enders *Honors Student* *Awarded Chancellor's Award for excellence in undergraduate research*
	Brenna Giordano *Honors Student*
2013 - 2014	Nicole Kashani *Honors Student* *Awarded Philip Steven Rethis Memorial Award for special character, determination, and scholarship*
	Maira Areguin *Lead Research Assistant*
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PROFESSIONAL SERVICE

Committee Member	UCSB Graduate Affairs Committee Member (October 2015 to September 2016) Sustainability Psychology Pre-Conference Committee Member (September 2016 to present) SAGE Center Forum on Social Psychological Education Interventions Co-organizer (November 2014)
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ABSTRACT

Inclusion of the environment in the self: Linking values to pro-environmental behaviors

by

Phillip John Ehret

Personal values are theorized to be fundamental drivers of individuals' behavior. However, the empirical work investigating the value-behavior relationship is relatively limited and often does not consider how values relate to self-concepts (e.g., individuals' different life roles). A more systematic examination of how values relate to the self may provide new insights on the value-behavior relationship, specifically because values which are included in the self-concept may predict large categories of behaviors, such as pro-environmental behaviors, more than values not included in the self-concept. The first part of this dissertation examined three elements of values—value ratings, value rankings, and value salience—and their associations with both general and role-specific pro-environmental behaviors. Across three studies (total $N = 521$), environmental value salience (i.e., how frequently one thinks about protecting the environment) was strongly and most consistently related to environmental behaviors, above and beyond environmental value ratings and rankings. The second part of the dissertation integrated this insight with a values-based behavior change theory, self-affirmation theory. Self-affirmation theory posits that when individuals affirm their most important value, they will exhibit less defensiveness and be more likely to change their behaviors. Although values are central to this behavior change approach, this theory has not been linked to broader value theorizing. The integration of the results of the first three studies and self-affirmation theory led to a new perspective on how self-affirmation might function in the environmental domain, and how a modified self-

affirmation manipulation which includes a value-linking component may be able to strengthen the inclusion of the environment in the self among participants and increase pro-environmental behaviors. In three experiments (total $N = 789$), the value-linking affirmation was able to increase environmental value salience by increasing perceived inclusion of environmental values in the self. Greater inclusion of the environment in the self was then related to greater pro-environmental behaviors. The experimental work was supported by a test of the validity of a new environmental behavior intention scale. The dissertation provides new insights to the theoretical understanding of the value-behavior relationship, and how the inclusion of environmental values in the self can be manipulated to increase pro-environmental behaviors.

TABLE OF CONTENTS

Chapter 1: Introduction

William James described the self as "the me and the I," with the "me" representing "the sum total of all that [a man] can call his" and the "I" representing the part of the self that "at any given moment is conscious" (James, 1910, p. 41). This fundamental insight about the self, that the self consists of many features (e.g., beliefs, memories, and emotions) but only a portion of those are active and ostensibly influencing an individual at a given moment, continues to influence contemporary self theories. For example, the multiple self-aspects framework (McConnell, 2011) formalizes how different self-aspects influence a range of psychological and behavioral outcomes. However, other psychological theories do not always consider how different self-concepts may influence theory-related outcomes. Value theories (Rokeach, 1973; Schwartz, 1992), for example, often do not often consider the role that the self and different self-concepts may play in regard to the relationship between values and behaviors. Integrating insights about the importance of self-concepts with values theories may provide a new theoretical lens to understand values and potentially strengthen the value-behavior relationship. Values are an important construct to study as they are considered predictors of broad sets of behaviors (Bardi & Schwartz, 2003; Dietz, Fitzgerald, & Shwom, 2005; Hines, Hungerford, & Tomera, 1987), which makes them particularly important in problem contexts where meaningful outcomes often require changing broad swaths of relevant behaviors such as increasing pro-environmental behaviors to address climate.

Prior value theory and research primarily focused on identifying a universal value structure, and how this value structure was exhibited across different cultures (Schwartz, 1992, 1994). Although, value theories emphasize the importance of values more broadly, arguing that they are a fundamental driver of behaviors (Rokeach, 1973; Schwartz, 2012),

there has been considerably less empirical work investigating the how values relate to different self-concepts as well as the value-behavior relationship compared to the structure and content of values (Bardi & Schwartz, 2003). In the first part of my dissertation, I propose that values are particularly relevant when trying to predict broad groups of behaviors, and I test this in Chapter 2 by conducting a theoretically informed examination of three elements of values (both in general and in specific self-concepts) that have not been fully theoretically or empirically examined and their potential relationships with behaviors.

In the second part of my dissertation, I integrate the insights from my investigations of the value-behavior relationship with a value-based behavior change approach to design a new behavior-change manipulation. Self-affirmation theory has been successfully used to change behavior in multiple domains by having individuals affirm important personal values (Sherman & Cohen, 2006; Steele, 1988). Although this approach relies on affirming values in its manipulations, it has largely been disconnected from broader value theories. By integrating affirmation theory, value theories, and the results from the first part of the dissertation, I designed and tested in Chapter 4 if a novel linking affirmation changed self-reported behaviors.

I tested these ideas in the environmental domain, a context where behavior change across a range of behaviors is urgently needed to address one of, if not the most, pressing societal issues we face, climate change. Individuals' behaviors in the United States are directly responsible for 20% of national carbon emissions (and up to 71% indirectly; Shammin, 2012; Shammin & Bullard, 2009). Thus, efforts to change multiple individual level pro-environmental behaviors (e.g., transportation choices, energy use, water use, food choice, and space temperature conditioning) can have a profound impact on the environment

and climate change (Gardner & Stern, 2008). By better understanding the relationship between values and general pro-environmental behaviors, and using that knowledge to change behaviors, this dissertation can continue to advance the theoretical understanding of values and contribute to mitigating the effects of climate change.

Values

Values theorists have long emphasized values as important drivers behaviors with researchers such as Gordon Allport (1961) claiming that values are a "dominating force in life" (p. 543). Individuals holding strong values of protecting the environment might, as a result of their values, engage in many types of pro-environmental behavior. Despite the assumed fundamental role of values in guiding many of the behaviors individuals engage in, values are a somewhat small field in social psychology as noted by a limited review of introductory social psychological textbooks that provided no discussion of any value theories (Rohan, 2000). Further, the term "value" has been used inconsistently across psychological research, leading to greater confusion of exactly what values are (Rohan, 2000). For this dissertation, I rely on the definition of values provided by the leading value theorist, Shalom Schwartz (1992):

> Values (1) are concepts or beliefs, (2) pertain to desirable end states or behaviors, (3) transcend specific situations, (4) guide selection or evaluation of behavior and events, and (5) are ordered by relative importance. (p. 4)

Values and pro-environmental behaviors

Although values have been relatively underexplored in social psychology, environmental psychologists have recognized the potential role values play in predicting pro-environmental behaviors. The values-beliefs-norms (VBN) theory is the most prominent and

well research value-based approach to understanding environmental action and its conceptualization of values is consistent with Schwartz's value theory (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). The VBN theory posits that values are a fundamental predictor of environmental behavior. Values, within the VBN framework, have been shown to predict environmental citizenship actions, policy support, and personal behaviors (Stern et al., 1999). Another proposed environmental behavior process model, based on a review of the literature, similarly posits the fundamental role of values (Fransson & Garling, 1999). Both models support the assumed role environmental values hold in predicting individuals' environmental behaviors.

Studies outside of the any formal theoretical framework have also found a relationship between environmental values and behavior. For example, a large correlational study tested the relationships between biospheric, altruistic, egoistic, and hedonic values and their relationships to environmental behaviors (Bouman, Steg, & Kiers, 2018). Broadly, the study found the predicted correlations between the values and energy-use behaviors and environmental policy support (e.g., biospheric values were positively related to pro-environmental outcomes, and hedonic values were negatively related to the same outcomes). Another study found that biospheric value versus economic value appeals were more effective at promoting environmental behaviors (Bolderdijk, Steg, Geller, Lehman, & Postmes, 2013). In this study, the researchers found that biospheric appeals to check tire pressures led to more individuals checking their tire pressures than economic appeals, suggesting that appeals to environmental values can lead to pro-environmental behavior. These environmental value theories and empirical studies provide evidence for the relationship between values and environmental behaviors (for a broad review, see Dietz et

al., 2005), but they often show weaker relationships than might be expected for such fundamental predictors of behaviors.

There may be three reasons why prior work has found limited support for robust relationships between environmental values and environmental behaviors. First, nearly all the existing work on values in the environmental domain (and other behavioral domains as well) defines values very broadly. In large part, this is due to researchers trying to establish universal values and value structures that hold across cultures (Rokeach, 1973; Schwartz, 1992). Typically, in the environmental domain, studies that use values to test relationships with other outcomes of interest such as behaviors investigate self-transcendent values and/or biospheric values. Self-transcendent values are values related to the concern for the welfare of others (e.g., world peace) as well as the environment (e.g., unity with nature) (Schwartz, 1992), and biospheric values are more specific (and often considered a dimension of self-transcendent values) in that they are concerned primarily with the natural world (e.g., respecting the earth) (Stern, Kalof, Dietz, & Guagnano, 1995). These more abstract values predict environmental outcomes, but their predictive power is limited. One study reported that biospheric values, even when accounting for other values (such as valuing personal comfort and safety), explained 35% of the variance in willingness to act politically for environmental issues (Stern et al., 1995). Two other studies found that self-transcendent values were related to both individual behaviors as well as environmentally related political behaviors, but only explained at most, 21% of the variance in self-reported behavioral intentions (Karp, 1996; Stern, Dietz, & Guagnano, 1998). Other conceptualizations of values outside of the Schwartz's value theory similarly employ broad value categories and find statistically significant, yet small relationships between environmentally-related values (e.g.,

altruism, anthropocentrism) and environmental outcomes (Axelrod, 1994; Thompson & Barton, 1994). It may be that broader definitions of values that include but are not solely environmental values weaken the potential relationship between environmental values and environmental behaviors. Thus, the current studies consider "environmental values" directly, defined as "protecting the environment, looking after the environment, caring for nature, and saving natural resources."[1]

A second limitation of existing value research is that values are most often measured on absolute rating scales. For example, on the Schwartz value survey (Schwartz, 2012), participants rate each value on a scale from -1 *opposed to my principles* to 7 *of extreme importance*. Interestingly, this measurement does not reflect a fundamental property of values, that they are hierarchical in nature (Schwartz, 2012). Other work investigating the value-behavior link also emphasized that values are most predictive of behaviors when they are believed to be part of individuals' self-concept (Verplanken & Holland, 2002), above and beyond if they are rated as important. The authors argue that general value importance ratings may reflect more than just personal importance, potentially also reflecting social norms or reporting biases, and that the strongest value-behavior relationships are observed when values are considered included in people's self-concept, not just rated as 'important.' Relative value rankings can help capture how central a value is to individuals' self-concept. A third and related limitation is that values must be activated or cued to exert influence on individuals' behaviors. As a result, an important value that is not cued would likely have little to no effect on behaviors. These limitations may in part account for findings that values do not often exhibit strong relationships with behaviors (Nordlund & Garvill, 2002) and

[1] The quoted text is the direct definition provided to participants in Studies 1-6.

emphasize the need for new efforts to better understand values and how they can relate to environmental behavior (Dietz et al., 2005). I discuss the last two limitations in more detail in the following sections.

Value hierarchies

Turning back to Schwartz's definition of values, values should be understood in relation to other values (Schwartz, 1992; see also Rokeach, 1973). Yet, very little values research considers how environmental values rank compared to other important personal values. Without considering a single value as part of a value hierarchy, researchers and practitioners are missing important information. Consider two individuals who rank environmental values as "very important" on a Likert scale. If environmental values are just one of five other "very important" values for the first individual, but the *only* "very important" value for the second individual, these two individuals will likely behave in very different ways, with the latter performing more environmental behaviors. Without accounting for how environmental values rank in comparison to other values there is no way of distinguishing between these two individuals and predicting why one may perform more behaviors than the other. The point regarding the need to consider the relative importance of values is emphasized in theoretical discussions of values (Rokeach, 1973; Schwartz, 2012), yet values are still commonly rated independent of other values with few exceptions.

One of the seminal research studies on values did measure value rankings, and found that increasing the rank of values of freedom and equality predicated greater support and likelihood of joining the NAACP (Rokeach, 1973). However, subsequent value studies did not commonly employ value ranking, mostly using value ratings as described above. In the environmental domain, only one study included a value ranking to predict environmental

behaviors (Howes & Gifford, 2009). In this study, individuals rated whether environmental or economic values were more important to them regarding their support for an environmental issue (i.e., offshore oil drilling) in different contexts (e.g., social norms present, immediacy of economic or environmental harm). Ranking environmental values as more important than economic values indeed predicted more environmental support (i.e., opposition to offshore oil drilling). However, this study only included these two values, providing limited information about value hierarchies as only two of the likely many personal values participants held were measured. Despite the hierarchical nature of values being a central dimension of their theoretical conceptualization, empirical research often does not include measures of value rankings. Thus, I specifically test absolute value ratings versus relative value rankings. I propose that relative value rankings will be more strongly associated with behaviors since value rankings capture additional information beyond absolute value importance.

Values and self-concepts

In addition to recognizing the hierarchical structure of values, I propose that these hierarchies may be dynamic and change depending on individuals' active self-concepts. This claim deviates from traditional values theory as values are believed to transcend specific situations (Schwartz, 1992). Nevertheless, there are reasons to expect that relative value rankings (or hierarchies) may by more dynamic than static.

Psychological theories of the "self," "self-concept," or "self-aspects"—often defined as individuals' all-encompassing beliefs about themselves—recognize that the self is dynamic and fluid, and not a unitary, monolithic entity (Markus & Wurf, 1987; McConnell, 2011). That is, individuals' beliefs about who they are vary depending on numerous internal

and external factors such as what subset of self was recently active, what they recently experienced, and their social situation (Markus & Wurf, 1987). Just as individuals' beliefs about themselves may change depending on the active self-concept, so might their value hierarchies. For example, the value of power may be particularly important when one is in his or her role as a workplace manager, but security may be more important when he or she is in his or her role as a parent. By recognizing that the self—and the values embedded within the self—varies, important information about values is gained, potentially increasing the ability to observe a stronger value-behavior relationship.

Although many factors can direct which aspects of a self are active at any given time, research often focuses on situational factors (e.g., presence of others, physical location, activities one is doing), largely because situational factors have a powerful influence on individuals and they are easier to measure and manipulate (Markus & Kunda, 1986). Recent theorizing has formalized the influence of situations on the self in the multiple self-concepts framework, which posits that the global self is comprised of multiple, context-dependent selves (McConnell, 2011). Consistent with this framework, multiple studies have shown how situations interact with role-specific selves to influence a variety of psychological outcomes including self-regulation, affect, attributions, and memory. One study investigating self-regulation first asked students to report on their promotion and prevention motivations in general and in different role-specific identities (i.e., domain-general, student-specific, and best-friend-specific identities; Browman, Destin, & Molden, 2017). Next, the researchers primed students to think of different roles, and then measured the strength of previously reported domain-general and role-specific regulatory motivations to the current motivations of the primed role. Role-specific regulatory motivations were most predictive of current

motivations above and beyond domain-general regulatory motivations, providing support that self-regulation varies by different role-specific self-concepts. In another study, participants were primed to think about a specific self-concept, their student or relationship self-concept, and then provided role-specific evaluative feedback (McConnell, Rydell, & Brown, 2009). The feedback had a greater impact on participants' mood when the feedback was relevant to the primed self-concept. This provides additional evidence that self-concept vary between roles, and this variation can influence emotions. Other research has also found support for varying self-concept and demonstrated that role-specific self-concept influenced both attributions (i.e., judgements of others' behaviors; Brown & McConnell, 2009) and memory encoding (Garczynski & Brown, 2013).

Research supports that individuals hold role-specific self-concept, and that these self-concepts impact a range of psychological outcomes. I propose that to understand how values function, we must recognize that they function within a dynamic self-concept which has numerous role-specific selves. The primary consequence of this proposition being that value ranking hierarchies may change depending on the active self-concept, just as emotion, attributions, and memories do.

Previous research provided some evidence that value rankings may change within individuals as different self-concepts are activated. Researchers applying value theories to different political issues have demonstrated that value rankings change depending on the issue in question. For example, one study reported that for different political issues, "individual rights" and "law and order" had different rankings within individuals (Sparks & Durkin, 1987). Further, issue specific value rankings were more predictive of attitudes towards certain political issues than overall values ranked as "guiding principles"

(Kristiansen & Zanna, 1988). Instead of assuming values must be guiding principles, it has been proposed that individuals possess multiple value systems that are dynamic and do not necessarily transcend situations (Seligman & Katz, 1996; Seligman, Syme, & Gilchrist, 1994). This multiple values system approach is congruent with a dynamic self, in that as different concepts of the self are activated, so too are different value ranking hierarchies that correspond to the active self-concept (Seligman & Katz, 1996).

In support of the multiple value hierarchies view, Seligman and Katz (1996) systematically tested whether individuals would change the rankings of their important life values under different contexts. The authors found that individuals changed the rank order of their values depending on what types of issues they were considering, contrary to what a traditional values approach that emphasizes that values transcend situations would predict (e.g., Rokeach, 1973; Schwartz, 2012). For example, when considering the issue of abortion, individuals often changed the ranking of how important values related to the sanctity of life were compared to the general value hierarchy they provided before a specific issue was presented. In the Howes and Gifford study (2009) reviewed above, where individuals rated whether environmental or economic values were more important to them in regards to their support for an environmental issue in different contexts, ranking environmental versus economic values varied across the different situations. Further, these situational rankings predicted environmental support while controlling for general value ranking. Although both situational and general value rankings were significant predictors of environmental support, the findings were mixed on which was more predictive. The authors did not make strong conclusions regarding the predictive strength of situational versus general value rankings. Nevertheless, these studies supported that value rankings likely do change between different

contexts, and thus it seems likely that value rankings specific to a given context (i.e., role-specific value rankings) would be more predictive of behaviors in that context than general value rankings.

Value salience

In addition to examining value rankings compared to value ratings and their associations with behavior, I also explore how frequently one thinks about a value (value salience) may relate to behaviors. It is possible that value hierarchies are not as malleable as I proposed above. Instead, the predictive strength of values lies more in whether or not a value is "activated" or not (Schwartz, 2012). Schwartz proposes that values are activated when they are relevant to a given behavior. Considering whether to take a new job offer may activate the value of achievement but not necessarily universalism. Thus, a general value hierarchy may not vary in structure, but the influence of the values will vary depending on which value is activated. I propose that recording explicit reports of how much one thinks about a given value reflects the degree to which the value is chronically "activated" in their different self-concepts.

Prior research has found that attitude accessibility, how easily a given attitude comes to mind, strengthens the attitude-behavior relationship. One study manipulated attitude salience by priming participants to think about their attitudes regarding affirmative action before evaluating a plaintiff in a fictional court case (Snyder & Swann, 1976). Among those who had their attitudes primed to be more salient and thus accessible, there was a stronger correlation between initial attitudes and judgements about the plaintiff. In related work, researchers found that there was a stronger relationship between attitudes and political candidate perceptions and voting behaviors when individuals' attitudes towards those

candidate were more accessible, as measured by how quickly they pushed a button to record their agreement with a statement such as "A good president for the next 4 years would be Ronald Reagan" (Fazio & Williams, 1986). These findings suggest that individuals' attitude strength is distinct from how much one thinks about the attitude (whether primed to think about or measured via response latency), and that greater attitude accessibility increases the strength of the relationship between attitudes and behaviors. Thus, regarding values instead of attitudes, the more people think about environmental values, the more likely they may predict pro-environmental behaviors, above and beyond value importance (whether measured through absolute ratings or relative rankings).

Dissertation Studies

Studies 1-3 are correlational studies that tested how environmental value rankings, ratings, and salience were related to both role-specific and general pro-environmental behaviors. Although these three elements of values (i.e., ratings, rankings, and salience) are conceptually similar, testing for differential relationships is useful in identifying which of these three elements should be targeted in manipulations to maximize potential behavior change. Studies 4-6 are experimental studies that tested how a new value-linking affirmation was related to general pro-environmental behaviors. This second set of studies was directly informed by the results of the first three studies; a more thorough introduction to this second set of studies is provided in Chapter 4. I also include a chapter (Chapter 3) that uses Rasch modeling to validate a new environmental behavior intentions scale, and I discuss the challenges of measuring pro-environmental behaviors and attitudes.

Main hypothesis, Studies 1-3

H1: Role-specific environmental value rankings will have stronger associations with role-specific pro-environmental behaviors than general environmental value rankings, environmental value ratings, and environmental value salience.

Secondary hypotheses, Studies 1-3

H2: General environmental value rankings will have stronger associations with general pro-environmental behaviors than environmental value ratings and environmental value salience.

H3: Environmental value salience will be significantly associated with both general and role-specific pro-environmental behaviors above and beyond environmental value ratings and rankings.

Chapter 2: Correlates of Pro-Environmental Behavior

This chapter includes three studies testing the relationships between environmental value rankings (general and role specific), salience, and ratings and self-reported pro-environmental behaviors. Studies 1 and 2 were conducted with participants from Amazon's Mechanical Turk, and Study 3 was conducted with undergraduate students. The main prediction was that role-specific environmental value rankings would have the strongest association with role-specific environmental behaviors, above and beyond environmental value ratings and salience. To test this, a new role-specific environmental value ranking measure was used and continually revised through each of the three studies to provide more accurate measurements of role-specific environmental value rankings.

Study 1

Design and participants

Study 1 was an online survey that took around 10 minutes to complete and was completed on participants' own computers. Participants (N = 251) were recruited from Amazon's Mechanical Turk (MTurk). The sample was 46.6% female (n = 117) and 53.4% male (n = 134). Ethnicity varied: 75.7% Caucasian (n = 190), 11.2% Asian (n = 28), 6.7% Black (n = 17), 6.4% other or multiracial (n = 15). Further, 12.7% (n = 32) reported they were Hispanic/Latino(a). Participants were, on average, 33.51 years old (SD = 11.29) and had a median education level of 2-year college degree. They were paid one dollar for participation.

MTurk samples have certain advantages and limitations. The greatest advantage of MTurk samples is that they provide a more diverse pool of potential participants than relying only on university subject pools which are primarily first and second year psychology majors

(Behrend, Sharek, Meade, & Wiebe, 2011). Psychological studies which rely on university subject pools are known to have limitations given the homogeneity of American undergraduate psychology students, particularly when trying to generalize findings to more diverse populations (Arnett, 2008; Gosling, Vazire, Srivastava, & John, 2004; Henrich, Heine, & Norenzayan, 2010). MTurk samples are also much more economical than other sampling services, allowing for larger samples to be collected. As a result, MTurk studies are common in psychological studies (Paolacci & Chandler, 2014), and many classical psychological effects have been replicated with MTurk samples (e.g., Behrend et al., 2011; Berinsky, Huber, & Lenz, 2012). However, there are known limitations to these samples. They are often more educated, more female, and report higher incomes than national averages (Paolacci & Chandler, 2014). MTurk samples should not be considered representative of the general US population (Berinsky et al., 2012), and further, they are likely an experienced and non-naïve population considering most MTurkers participate in multiple psychological studies and experiments in their roles as MTurk workers (Chandler, Mueller, & Paolacci, 2014). Although this non-naivety leads to data quality concerns, research generally finds that data quality is not a major concern (Peer, Vosgerau, & Acquisti, 2014) and that various attention check questions designed to ensure participants are paying attentions can lead to arbitrary and over-exclusion of participants (Chandler et al., 2014). As such, I do not use any attention check questions or exclude participants based on their response patterns; if there are data quality issues, this should weaken effects and thus lead to more conservative effect estimates.

Considering time and financial constraints, I collected the largest sample I could. I recruited as large a sample as possible in early studies to have the greatest power to detect

potentially small effect sizes. I conducted a post-hoc power analysis and found that the smallest correlation and regression coefficient I could test with 80% power with my final sample for Study 1 was a correlation of $r \geq .18$ and a regression coefficient of $f^2 \geq .03$, both small effect sizes (Faul, Erdfelder, Lang, & Buchner, 2007).

Procedure and scales

After agreeing to the information sheet, participants completed an environmental value ratings scale, an environmental value salience scale, and the role-specific values (RSV) instrument. Next, participants completed two pro-environmental behavior questionnaires, one which asked about role-specific environmental behaviors and another which asked about general environmental behaviors. Finally, they completed a demographics questionnaire. It is important to recognize that the survey design may have introduced bias into the different environmental value scales and the behavior scales. Given that the three environmental value scales and that the behavior scales were asked one right after the other, answers to one scale likely biased answers to another. This may have produced artificially inflated correlations between the environmental value scales and behavior scales, respectively. Using more filler questions to separate similar scales or measuring the constructs at different time points would have reduced potential bias, but was not feasible given time and financial constraints.

Environmental value ratings. Participants were first asked to indicate how important 11 primary life values were to them. These values were selected from the Schwartz value survey which was designed to provide a comprehensive set of life values (Schwartz, 1992). Values included: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, security, and protecting the environment. Each value was accompanied by an explanatory phrase provided by the original scale (e.g., “PROTECTING

THE ENVIRONMENT (looking after the environment, caring for nature, saving natural resources)"), and participants indicated the importance of the value on a seven-point Likert scale from 1 *Not important* to 7 *Of supreme importance*. The value of interest was "protecting the environment," and the other values were included to reduce bias in value importance reporting.

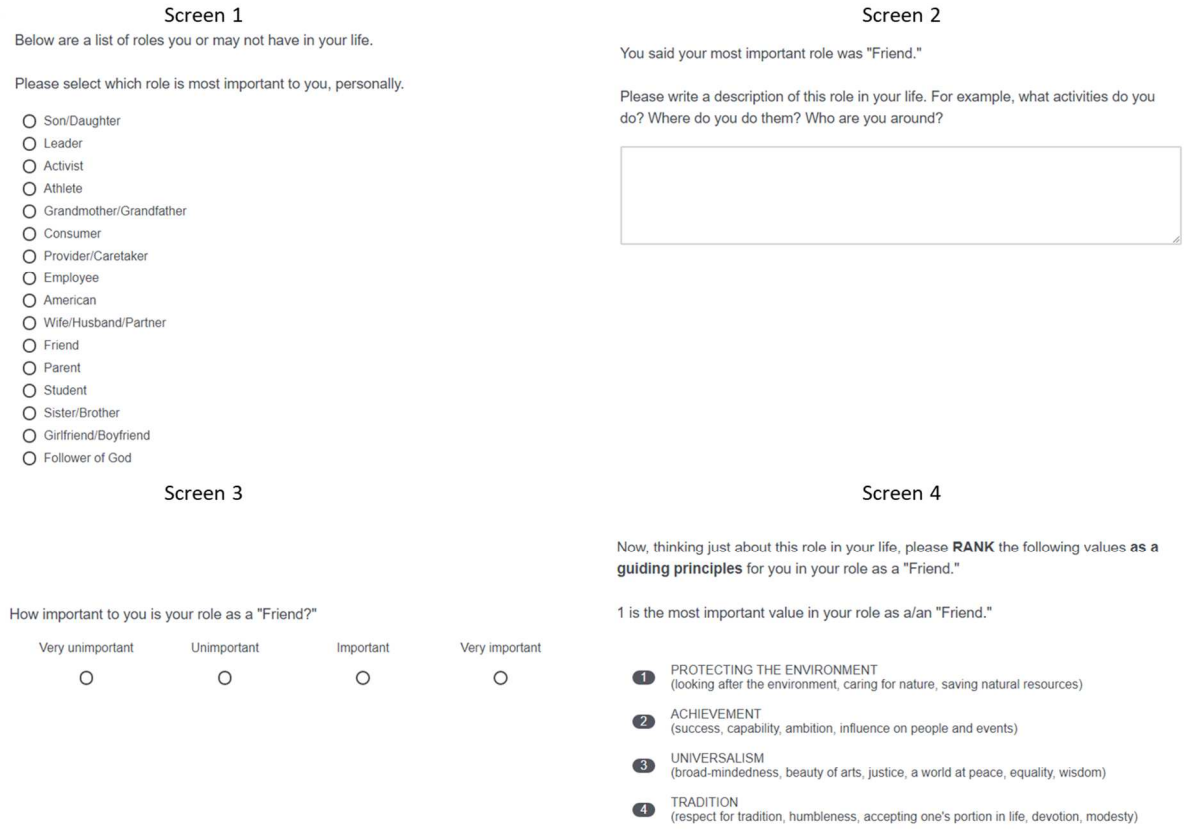
Environmental value salience. The environmental value salience scale mirrored the environmental rating scale and included the same 11 values, except that a different prompt and scale anchors were used. The scale instructed participants to "Please indicate how much you think about each of the following values." The scale points ranged from 1 *I never think about this* to 7 *I almost always think about this*.

General environmental value ranking. The environmental value ranking scale again mirrored the environmental rating scale, except participants were asked to "Please, rank the importance of the following values as a life-guiding principle for you." Participants could then click and drag the 11 values into an order that reflected their relative importance. Lower numbers represented more important values (e.g., 1 was their most important value).

RSV instrument. The RSV instrument was developed and pilot tested to be a measure of role-specific environmental value rankings. See Appendix A for pilot testing procedures and results. The RSV instrument first instructed participants to choose from a list a role that was most important to them, personally. Next, participants wrote a brief description of the role they selected and indicated how important it was to them. I then asked participants, "Now, thinking about this role in your life, please rank the following values as guiding principles for you in your role as a [most important role selection]." There were 11 values, the same values as used the environmental rating and salience scales. Figure 1

presents an example of the RSV instrument. The role-specific environmental value ranking was recorded.

Figure 1. The four screens of the RSV instrument. Screen 4 in the figure does not present all 11 values given space constraints, but participants were able to view and rank all 11 values.



Pro-environmental behaviors. Two scales were used to measure role-specific and general pro-environmental behaviors. For both scales, participants reported how often they did each of 11 different behaviors (e.g., I make a special effort to buy recyclable products, I pick up litter, I try to reduce my water use) on a seven-point Likert scale from 1 *Never* to 7 *Almost always.* The role-specific scale asked participants how often they did each of the following behaviors "in your role as a/an [most important role]" ($\alpha = .85$). The general

behavior scale asked participants to think about their life in general and report how much they did each of the behaviors (α = .86). All scales are reported in Appendix B.

Results

First, means and correlations were calculated for the study variables (see *Table 1*). Next, a series of multiple regressions were run testing the relative associations between role-specific environmental value rankings, general environmental value rankings, environmental value ratings, and environmental value salience on both role-specific and general pro-environmental behaviors (see Table 2).

Table 1. Means and correlations from Study 1

	Correlations					Mean (*SD*)
	1.	2.	3.	4.	5.	
1. Role-specific environmental behaviors	—					4.23 (1.17)
2. General environmental behaviors	.85	—				4.30 (1.12)
3. Role-specific environmental value rankings	-.41	-.40	—			8.01 (2.48)
4. General environmental value rankings	-.45	-.47	.58	—		7.22 (2.54)
5. Environmental value ratings	.58	.56	-.51	-.64	—	4.61 (1.62)
6. Environmental value salience	.63	.62	-.47	-.58	.75	4.12 (1.75)

Note. All correlations signification at $p < .001$. Lower values for ranking variables represented more important value rankings (i.e., most important value was ranked 1).

Table 2. Regression coefficients for environmental value variables on role-specific and general environmental behaviors from Study 1

	Role-specific environmental behaviors		General environmental behaviors		VIF
	B (*SE*)	β	*B* (*SE*)	β	
Intercept	2.86 (0.44)***		3.20 (0.43)***		
Role-specific environmental value rankings	-0.04 (0.03)	-.08	-0.03 (0.03)	-.07	1.59
General environmental value ranking	-0.02 (0.03)	-.04	-0.04 (0.03)	-.08	2.03
Environmental value rating	0.14 (0.06)*	.20	0.10 (0.06)	.15	2.70
Environmental value salience	0.28 (0.05)***	.43	0.28 (0.05)***	.43	2.37

Note. VIF = variance inflation factor. * $p < .05$, *** $p < .001$.

Each of the environmental value, salience, and rating scales were strongly correlated with general and role-specific environmental behaviors, as well as with each other. Importantly, general and role-specific environmental behaviors were highly correlated ($r = .85$, $p < .001$) which suggested there may not have been much distinction between individuals' behaviors in general and in their most important role. Although expected, it is important to note the strong correlations between the environmental value ranking, salience, and rating scales. The correlations between these scales ranged from .47 to .75 (absolute values). Thus, it is important to determine if each of these scales of environmental values is distinct from each other. The multiple regressions provide a statistical test to determine if each of these environmental value scales independently explained variance in environmental behaviors when accounting for each of the other scales.

The results were similar for both multiple regressions for role-specific and general pro-environmental behaviors. Environmental value salience was both significant and had the largest effect (standardized β = .43) on behaviors for both models. Given the strong zero-order correlations among the independent variables in the regression models, there was a

concern of multicollinearity. The variance inflation factor (VIF) was calculated for the independent variables as measure of multicollinearity. Although there was evidence for multicollinearity (VIF > 1), the VIF values fell well below the threshold for concern (VIF > 10) (Field, 2009). Thus, the standard errors are slightly elevated due to correlations between the independent variables, but not so much that the model cannot be interpreted[2]. The regression results, particularly the standardized βs which allow for direct comparisons between independent variables, and VIF values provided statistical evidence that, although related, the different environmental value variables have differential relationships with environmental behaviors, and that environmental value salience had the strongest relationship with role-specific and general environmental behaviors.

Discussion

The main prediction that role-specific rankings would have the strongest association with role-specific behaviors was not supported. Regardless of behavioral outcome, environmental value salience consistently had the strongest relationship with environmental behaviors. However, there are two concerns with regard to the RSV instrument and how value rankings may or may not relate to behaviors. First, there was a very strong correlation between role-specific and general environmental behaviors. It may be that individuals' most important role was also the role they most commonly found themselves in. Thus, general behaviors were largely reflective of this most important role, and thus the general and role-specific rankings were not distinct. As such, it may not be possible to determine differential relationships between role-specific and general behaviors. Although role-specific and general

[2] Multicollinearity leads to inflated standard errors, which is particularly problematic when interpreting null results given that they may be null due to artificial variance inflation. Given that these models still found significant relationships, multicollinearity is not a major concern.

behaviors were highly correlated, the two ranking scales were not so highly correlated that they were always the same ranking (r = .58). Second, environmental values were often ranked rather low on individuals' ranking order; on average, they were individuals' seventh or eighth most important value out of 11. It may be that value rankings hold little meaningful psychology distinction beyond the top three or four values. For example, it is hard to imagine how much an eighth most important value influences any given situation compared to someone's first or second most important value. I ran additional models that coded environmental value rankings in different ways (e.g., 0 = ranked 3 or lower, 1 = ranked most important or second most important value), and none of the alternative coding schemes revealed any different results. However, these analyses were largely limited by how low environmental values were ranked. Less than 5% of participants indicated environmental values were a first or second most important role-specific or general life value (and less than 10% ranked it in their top three values).

Study 2

Study 1 found that environmental value salience had the strongest relationship with the behavioral outcomes. Study 2 was designed to replicate these findings and to also use a revised version of the RSV instrument to better test the relationship between role-specific value rankings and behavior. The potential relationship between role-specific value rankings and behaviors may have been weakened by the variability in roles chosen by participants. Some roles may have afforded opportunities to engage in more environmental behaviors than others. For example, choosing a role such as "athlete" or "employee" may limit how much one can even choose to engage in environmental behaviors given those role contexts. Despite high environmental value rankings in those roles, there are few if any possibilities to act on

those values. The revised RSV measure provided a limited number of roles that were important life domains, but also life domains where it is reasonable that participants could choose to engage in environmental behaviors.

Design and participants

MTurk participants (N = 199) completed an online survey on their own computers that took around 10 minutes to complete. The sample was 49.2% female (n = 98) and 50.8% male (n = 101). Ethnicity varied: 76.4% Caucasian (n = 152), 8.0% Asian (n = 16), 8.0% Black (n = 16), and 7.6% other or multiracial (n = 15). Further, 9.5% (n = 19) reported they were Hispanic/Latino(a). Participants were, on average, 33.47 years old (SD = 10.46). Participants were paid one dollar for their participation.

I again computed the smallest correlation and regression coefficient I could test with 80% power given my final sample. I was fully powered to detect correlations of $r \geq .20$ and I was fully powered to detect regression coefficients of $f^2 \geq .03$, both small effect sizes (Faul et al., 2007).

Procedure and scales

The procedures were the same as Study 1, expect that participants completed a revised RSV instrument. Participants first completed an environmental value salience scale, an environmental value rating scale, and the revised role-specific values (RSV) instrument. Next, participants completed two pro-environmental behavior questionnaires, one which asked about general environmental behaviors and another which asked about role-specific environmental behaviors. Finally, they completed a demographics questionnaire. All scales are reported in Appendix B.

RSV instrument. The first revision to the RSV instrument was designed to reduce variability in roles by limiting the number of available roles participants could choose. In this study, participants were allowed to select one of the following as their most important role: parent, wife/husband/partner, friend, student, family member, provider/caretaker, or follower of God.

Environmental value scales. All other environmental value ratings, rankings, and salience scales were the same as in Study 1.

Pro-environmental behaviors. I used the same two environmental behavior scales as Study 1: role-specific environmental behaviors ($\alpha = .85$) and general environmental behaviors ($\alpha = .84$).

Results

First means and correlations were calculated for the study variables (see Table 3). Next, a series of multiple regressions tested the relative associations between role-specific environmental value rankings, general environmental value rankings, environmental value ratings, and environmental value salience on both role-specific and general pro-environmental behaviors (see Table 4).

Table 3. Means and correlations from Study 2

	Correlations					Mean (*SD*)
	1.	2.	3.	4.	5.	
1. Role-specific environmental behaviors	—					4.33 (1.09)
2. General environmental behaviors	.87	—				4.37 (1.07)
3. Role-specific environmental value rankings	-.42	-.39	—			8.31 (2.35)
4. General environmental value rankings	-.39	-.41	.55	—		7.06 (2.83)
5. Environmental value ratings	.56	.59	-.37	-.59	—	4.73 (1.63)
6. Environmental value salience	.54	.59	-.38	-.59	.74	4.31 (1.72)

Note. All correlations were significant at $p < .001$. Lower values for ranking variables represented more important value rankings (i.e., most important value was ranked 1).

Table 4. Regression coefficients for environmental value variables on role-specific and general environmental behaviors from Study 2

	Role-specific environmental behaviors		General environmental behaviors		VIF
	B (*SE*)	β	*B* (*SE*)	β	
Intercept	3.25 (0.43)***		2.95 (0.41)***		
Role-specific environmental value rankings	-0.12 (0.03) ***	-.25	-0.09 (0.03) **	-.19	1.45
General environmental value ranking	0.04 (0.03)	.10	-.03 (0.03)	.09	2.02
Environmental value rating	0.23 (0.06) ***	.35	0.22 (0.06) ***	.34	2.39
Environmental value salience	0.16 (0.06)**	.25	0.20 (0.05) ***	.32	2.40

Note. VIF = variance inflation factor. ** $p < .01$, *** $p < .001$.

Once again, each of the environmental value, salience, and attitude scales were strongly correlated with general and role-specific environmental behaviors, as well as with each other. Importantly, general and role-specific environmental behaviors were highly correlated ($r = .87$, $p < .001$) which suggested that there may not be much distinction between individuals' behaviors in general and in their most important role. There were also strong correlations between the environmental value ranking, salience, and rating scales as with Study 1. The correlations between these scales ranged from .37 to .74 (absolute values). As with Study 1, multiple regressions tested if each of these elements of environmental values was distinct from each other.

The results were similar for both role-specific and general pro-environmental behavior regression models, however, they diverged from the findings in Study 1. Replicating Study 1, environmental value salience was significantly associated with role-specific and general pro-environmental behaviors. Unlike Study 1, environmental ratings were also significantly associated with both behavioral outcomes and reported the strongest relationships with the behavior outcomes. As predicted, role-specific value rankings did

significantly relate to role-specific behaviors such that more important rankings (i.e., rankings closer to 1) were related to greater reported role-specific environmental behaviors. Interestingly, role-specific rankings remained significantly associated with general environmental behaviors as well, above and beyond general environmental value rankings which were not significant.

Given the strong zero-order correlations, the VIF was calculated for the independent variables as measure of multicollinearity. There was evidence for multicollinearity (VIF > 1), but the VIF values fell well below the threshold for concern (VIF > 10) (Field, 2009). These results suggested that role-specific rankings, environmental value ratings, and environmental value salience are all related to self-reported environmental behaviors.

Discussion

My main prediction that role-specific values would be associated with role-specific environmental behaviors was supported in Study 2, however it did not have the strongest association with behaviors. The higher individuals ranked environmental values in their selected role, the more environmental values they reported doing in that role. However, role-specific value rankings also had a significant relationship with general environmental behaviors while general environmental rankings were non-significant. This latter relationship was unexpected and may be the consequence of the high correlation between role-specific and general environmental behaviors. When reporting general environmental behaviors, participants may be anchoring their responses to the role(s) that come to mind easily, which may be their most important roles. Further, general behaviors are reported after role-specific behaviors in the survey, potentially adding to the bias the selected role may have on general behaviors since it was primed by previous survey questions. Thus "general" pro-

environmental behaviors may in fact be more representative of the role-specific behaviors than a true general measure of behaviors. Nevertheless, the revised RSV measure may have helped reveal a relationship between role-specific environmental value rankings and behaviors.

Salience was significantly associated with both role-specific and general environmental behaviors, replicating Study 1. Additionally, there was a significant relationship between environmental value ratings the behavior outcomes. Contrary to my predictions, salience had the strongest relationship with behavioral outcomes. Although environmental value ratings were not significant in Study 1, it is not surprising that they are significant in Study 2. Numerous studies, as reviewed in Chapter 1, find relationships between value ratings and behaviors. The important question is whether value rankings and value salience can explain variance in behaviors above and beyond attitudes, which they do.

Given that environmental rankings, ratings, and salience were all statistically significant, it is important to consider the strength of each of these variables' relationship with behaviors. For both role-specific and general behaviors, environmental value ratings had the strongest relationships (βs = .35 and .34, respectively). However, for general environmental behaviors, environmental value salience had nearly as strong of a relationship as environmental value ratings (β = .32). Role-specific value rankings had a stronger relationship with role-specific behaviors (β = -.25) than general behaviors (β = -.19) but had the same or weaker relationship when compared to the relationships between salience and the role-specific (β = .25) and general environmental behaviors (β = .32). Thus, environmental value salience had at least as strong if not stronger relationships with behaviors than rankings, and nearly as strong of a relationship with behaviors as ratings.

Study 3

Although Study 2 found the predicted relationship between role-specific value rankings and role-specific behaviors, it also found a significant relationship between role-specific value rankings and general behaviors. Study 3 was designed to help distinguish a selected role from self-reports on general behavior by assigning a role to all participants, and to provide a third examination of the now twice replicated finding of the relationship between environmental value salience and environmental behaviors.

Design and participants

Study 3 extended Studies 1 and 2 with an undergraduate student sample and with a second revision to the RSV instrument. An undergraduate participant sample was selected as this sample ensured all participants shared the role of "student," which could then be assigned as the role in the RSV instrument. Participants completed an online survey in a psychology laboratory that took around 10 minutes to complete. Participants (N = 71) were undergraduate students and received course credit for participation. The sample was 70.4% female (n = 50) and 29.6% male (n = 21). Ethnicity varied: 51.5% Caucasian (n = 35), 30.9% Asian (n = 21), 14.7% other or multiracial (n = 10), and 2.9% Black (n = 2). Further, 21.1% (n = 15) reported they were Hispanic/Latino(a). Participants were, on average, 19.76 years old (SD = 1.72).

As discussed above, there are limitations to student samples, particularly given the homogeneity of their demographics (Arnett, 2008; Henrich et al., 2010). However, I choose a student sample in this study given that is was the most readily accessible population that all shared a common role, student.

I again computed the smallest correlation and regression coefficient I could test with 80% power given my final sample. I was fully powered to detect correlations of $r \geq .32$ and I was fully powered to detect regression coefficients of $f^2 \geq .09$, both medium effect sizes (Faul et al., 2007).

Procedure and scales

The procedures were the same as Studies 1 and 2, expect that participants completed a revised RSV instrument specifically about their "student" role; they did not choose their role. Participants first completed an environmental value salience scale, an environmental value rating scale, and the revised RSV instrument. Next, participants completed two pro-environmental behavior scales, one which asked about general environmental behaviors and another which asked about role-specific environmental behaviors. Finally, they completed a demographics questionnaire. All scales are reported in Appendix B.

Revised RSV instrument. The revised RSV instrument assigned students to rank their values regarding their role as a student. Given all participants were undergraduates, they all had this role and it was likely an important role in their lives. Pilot testing with a student sample found that 73% reported "student" as one of their top 3 most important roles.

Environmental value scales. All other environmental value ratings, rankings, and salience scales were the same as in Studies 1 and 2.

Pro-environmental behaviors. I used the same two environmental behavior scales as Studies 1 and 2: role-specific (student) environmental behaviors ($\alpha = .67$) and general environmental behaviors ($\alpha = .62$).

Results

First means and correlations were calculated for the study variables (see Table 5). Next, a series of multiple regressions tested the relative associations between role-specific environmental value rankings, general environmental value rankings, environmental value ratings, and environmental value salience on both role-specific and general pro-environmental behaviors (see Table 6).

Table 5. Means and correlations from Study 3

	Correlations					Mean (*SD*)
	1.	2.	3.	4.	5.	
1. Role-specific environmental behaviors	—					4.34 (0.79)
2. General environmental behaviors	.82***	—				4.25 (0.77)
3. Role-specific environmental value rankings	-.35**	-.10	—			8.39 (2.05)
4. General environmental value rankings	-.48***	-.32**	.67***	—		8.23 (2.35)
5. Environmental value ratings	.49***	.40***	-.40***	-.49***	—	4.92 (1.41)
6. Environmental value salience	.61***	.59***	-.45***	-.52***	.61***	4.03 (1.48)

Note. ** $p < .01$, *** $p < .001$. Lower values for ranking variables represented more important value rankings (i.e., most important value was ranked 1).

Table 6. Regression coefficients for environmental value variables on role-specific and general environmental behaviors from Study 3

	Role-specific environmental behaviors		General environmental behaviors		VIF
	B (*SE*)	β	*B* (*SE*)	β	
Intercept	3.48 (0.62)***		2.35 (0.61)***		
Role-specific environmental value rankings	0.02 (0.05)	.05	0.12 (0.05)*	.31	1.85
General environmental value ranking	-0.07 (0.05)	-.21	-0.06 (0.05)	-.19	2.11
Environmental value rating	0.08 (0.07)	.14	0.04 (0.07)	.07	1.70
Environmental value salience	0.23 (0.07)**	.43	0.30 (0.07)***	.59	1.80

Note. VIF = variance inflation factor. * $p < .05$, ** $p < .01$, *** $p < .001$.

Once again, each of the environmental value, salience, and rating scales were strongly correlated with general and role-specific environmental behaviors, as well as with

each other. Despite assigning all students the same role, general and role-specific environmental behaviors were still highly correlated ($r = .82$, $p < .001$) which suggested that there may not be much distinction between individuals' behaviors in general and their behavior as a student. There were also strong correlations between the environmental value ranking, salience, and attitude scales as with Studies 1 and 2. The correlations between these scales ranged from .32 to .67 (absolute values). The one exception was that role-specific environmental value rankings and general environmental behaviors were not significantly correlated ($r = .10$, $p = .393$). As with the two previous studies, multiple regressions tested if each of these scales of environmental values was distinct from each other.

The results were similar for both multiple regressions for role-specific and general pro-environmental behaviors and were more similar to Study 1 than Study 2. Replicating Study 1 and 2, environmental value salience was significantly associated with role-specific and general pro-environmental behaviors. Environmental ratings were not associated with either behavioral outcomes. Role-specific value rankings did not significantly relate to role-specific behaviors but did have a positive relationship with general environmental behaviors such that less important role-specific environmental values were related to more general environmental behaviors.

The VIF was calculated for the independent variables as a measure of multicollinearity. Similar to Studies 1 and 2, there was evidence for multicollinearity (VIF > 1), but the VIF values still fell well below the threshold for concern (VIF > 10) (Field, 2009). In this student sample, environmental value salience was the strongest predictor for both role-specific and general environmental behaviors.

Discussion

The main prediction of role-specific environmental values being associated with role-specific behaviors was again not supported. However, the relationship between environmental value salience and both role-specific and general environmental behaviors was replicated and had the strongest effect size observed across the three studies. Although the revision to the RSV instrument used in this study was in part designed to create a greater distinction between general and role-specific behaviors, it did not seem to be effective given the high correlation between self-reported role-specific and general environmental behaviors. As previously noted, this may be in part because of the study design where participants report general behaviors immediately after role-specific behaviors, where general behavior responses may be biased by role-specific responses. It may also be that for students, given that the majority of their time is likely in the role of a "student," that there is a high correlation between their student-role behaviors and general behaviors. There is also one unexpected finding, the positive relationship between role-specific value rankings and general environmental behaviors. It is not clear why less important role-specific value rankings would lead to greater general pro-environmental behaviors. The prediction would be a null relationship between role-specific and general environmental behaviors when controlling for general environmental value rankings. It is possible this is a type I error, and given that it is not predicted nor replicated in the previous two studies, I do not interpret this finding or consider it meaningful.

General Discussion

Across three studies, among a general MTurk population and undergraduate students, I found a consistent and strong positive relationship between environmental value salience

and environmental behaviors, above and beyond environmental value rankings and ratings. There was not consistent support for the main prediction that role-specific environmental rankings would be most strongly associated with role-specific environmental behaviors, above and beyond salience and ratings. Although I predicted a relationship between value ratings and value salience with behaviors, I did not predict value salience would have the strongest relationship.

There are three important considerations when interpreting the lack of support for my main prediction. First, there is a need for continued revision of the RSV instrument. Allowing participants to choose their own most important role likely introduced a lot of variability in how much each role afforded individuals opportunities to engage in pro-environmental behaviors. For example, a role of "employee" may have limited opportunities to engage in pro-environmental behavior unless individuals have decision making power at an organization. Similarly, people identifying "parent" as their most important role may believe that recycling is linked to creating a healthy environment for their children, whereas others might not see that link. Thus, the variability in roles chosen and perceptions about available behaviors in those roles may reduce the ability to detect a relationship between role-specific value rankings and role-specific behaviors. Trying to hold roles constant as I did in Study 3 may have reduced some variability in available behaviors, assuming all students can engage in similar amount of environmental behaviors, but it may also reduce the ability to distinguish between general and role-specific behaviors if the selected or assigned role is a prominent role in individuals' lives. One potential way to overcome these challenges is to choose more specific and distinct roles, like "tourist." Tourist-specific values may

predict tourist-specific behaviors above and beyond other general measures of environmental values.

A second and related concern regarding environmental value rankings is that on average, whether we look at role-specific or general environmental value rankings, they are ranked quite low (seventh or eighth most important value the of 11 possible values). It is possible and likely that value ranking is most predictive of behaviors when a given value is a top ranked value. It is less clear how a fifth ranked value and an eighth ranked value would differ in their relationships with behaviors compared to a first ranked value and eight ranked value where the relationship might be observed more clearly. This may suggest that value-rankings and their relationships with behaviors will be best tested when the domains chosen often have individuals rank the target value high. For example, hedonism may be highly ranked in role doing a favorite hobby (e.g., eating out, watching movies) but may not be ranked as high for one's life in general. To best test the relationships of value rankings, participants should be guided to choose roles where the target value is either ranked high or low compared to general values. This will provide the necessary variance that I did not observe with environmental values, which were consistently ranked low for all roles and in general.

The third concern with testing the main prediction was the lack of distinction between role-specific and general pro-environmental behaviors. Across all three studies, role-specific and general environmental behaviors were highly correlated, suggesting that they may not represent distinct constructs. If they do not represent distinct constructs, differential relationships with predictors cannot be found. This high correlation may be in part due to bias introduced from the study design given that both behavioral scales were

answered in sequence. It may also be that since we allowed participants to choose a role that was important in their life, that this role was a role they generally find themselves in, and thus, the 'role-specific' behaviors are not distinct from general behaviors. It may again be helpful to help participants choose roles where their role-based behaviors differ significantly from their general behaviors. "Traveler" might be a role where individuals' behaviors differ from their normal routine; they may, for example, buy more disposable products or fail to reuse towels in a hotel room. Given these concerns, coupled with the results from Study 2, which were supportive of the main prediction, it may be unfair to strongly claim that the main hypothesis is untrue. Instead, there may be utility in using role-specific value rankings to predict role-specific behaviors. However, there needs to be more work to resolve the measurement and study design issues discussed above. What did emerge as a strong and consistent finding across all three studies was the positive relationship between environmental value salience and environmental behaviors.

The broad purpose of these three studies was to identify an element of environmental values that would best explain variance in environmental, which would then be used to inform the later behavior change manipulations in the second part of the dissertation. Environmental salience emerged as the most consistent and strongest associate of environmental behaviors. Given that role-specific rankings did not exhibit the predicted relationships and that there was not much distinction between role-specific and general pro-environmental behaviors, I ran a series of regression models regressing general environmental behaviors on environmental value ratings, rankings, and salience only (Table 7). Across the three studies, these models demonstrated that environmental value salience was significantly associated with environmental behaviors, and that the effect size for this

relationship was medium to medium-large. Thus, environmental value salience, how much one thinks about environmental values, provides a new understanding of what may lead to individuals' engagement in pro-environmental behaviors. The implication of this finding for behavior change manipulations is that an effective manipulation should focus on increasing the perceived inclusion of the environment in the self, possibly by linking environmental values to core values. The more the environment is part of the self, the more likely it is for environmental values to be activated in different self-roles, reflected by greater levels of general environmental value salience. If rankings emerged as the strongest associate of environmental behaviors, that would have implied that future manipulations should focus more explicitly on changing value rankings, possibly by using an approach similar to Rokeach (1973) where he contrasted value rankings of undesirable outgroups to motivate ranking change.

Table 7. Environmental value salience, ratings, and ranking predicting pro-environmental behaviors

	Study 1		Study 2		Study 3	
	B (SE)	*β*	*B* (SE)	*β*	*B* (SE)	*β*
Intercept	2.90***		2.96***		2.94***	
	(0.35)		(0.38)		(0.57)	
General environmental value ranking	-0.04	-.10	-0.05***	-.11	< -0.01	< -.01
	(0.03)		(0.03)		(0.04)	
Environmental value rating	0.12*	.18	0.11*	.16	0.03	.06
	(0.05)		(0.06)		(0.07)	
Environmental value salience	0.29***	.45	0.28***	.44	0.29***	.55
	(0.05)		(0.05)		(0.07)	
R^2	.42***		.42***		.35***	

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

Limitations

Studies 1-3 have limitations to consider. First, these are correlational studies, so no causal inferences can be made. This is an important point as the implication of these findings is that value salience is the strongest predictor of behaviors. Yet, there is no direct evidence of that causal relationship. An alternative explanation of the correlational findings could be that the more environmental behaviors individuals do, the more likely they are to think about their environmental values. It is likely that the value salience, and well as value rating and ranking, relationship with behaviors is bi-directional. However, there is more theoretical support for the strongest causal direction being from value salience, ratings, and rankings to behaviors. General value theories explicitly posit values are fundamental predictors of behaviors (Rokeach, 1973; Schwartz, 2012), and environmental value theories similarly posit values predict pro-environmental behaviors (Fransson & Garling, 1999; Stern et al., 1999); no value theories provide any strong support for the reverse relationship likely driven by the motivation of researchers to predict behavioral outcomes as opposed to using behaviors to predict values. Second, as discussed above, there are concerns about the measurement of both value rankings and role-specific versus general environmental behaviors. Third, environmental value ratings and salience relied on single item scales. Although these items were based off of a well validated values scale (Schwartz, 2012), I did not compare them to existing environmental scales such as the New Environmental Paradigm (NEP) scale (Dunlap, Van Liere, Mertig, & Jones, 2000), the most widely used environmental attitude scale (Dunlap, 2008; Hawcroft & Milfont, 2010). Thus, there is a need to test how distinct environmental value salience is from other attitude scales and to compare the relative strength of their relationships with pro-environmental behaviors.

Summary

Although there was not consistent support for the main prediction of role-specific environmental value rankings being most strongly associated with role-specific behaviors, I did find a robust and consistent positive relationship between environmental value salience and environmental behaviors. This finding provides a new target for manipulations that are trying to increase environmental behaviors. Often interventions in the environmental domain try to persuade individuals of the relative or absolute importance of the environment and why they should engage in more pro-environmental action (for review, see Steg & Vlek, 2009). Although there may be utility in that approach, the results of Studies 1-3 suggest that instead of persuading individuals to value the environment more, behavior change approaches that can find new ways of increasing the inclusion of environmental values in the self (leading individuals to think about environmental values more often) may lead to greater pro-environmental action given the stronger link between value salience and behaviors than value ratings or rankings and behaviors. Studies 4-6 test a new manipulation that integrates the insights regarding value salience with an existing value-based theory, self-affirmation (Sherman & Cohen, 2006; Steele, 1988), to increase pro-environmental behaviors.

Chapter 3: Validity of the Reoccurring Environmental Behavior Intentions Scale

Given the lack of causal evidence between environmental salience and general pro-environmental behaviors from Studies 1-3, an important next step is to use experiments to establish causal support for the value salience to behavior relationship. Inherent to these experimental studies is the need to measure environmental behavior-relevant outcomes. The general pro-environmental behavior scale used in Studies 1-3 is not well suited to measure changes after an experimental manipulation given that the scale asks about general behavioral tendencies. Longitudinal studies with long timeframes may be able to detect changes in general tendencies from a manipulation overtime, but another option is to measure behavioral intentions. Although behavioral intentions do not fully predict behaviors, there is a strong relationship between intentions and behaviors (for review, see Webb & Sheeran, 2006). More importantly, intentions can be and are often used to detect differences immediately after a manipulation (e.g., Eom, Kim, & Sherman, 2018; Smith et al., 2012). This chapter tests the validity of the reoccurring environmental behavior intentions scale (REBIS), a new intentions scale that is used in Studies 5 and 6 in the following experimental studies[3].

Existing Environmental Outcome Scales

With the growing number of psychological studies investigating sustainability and climate change related outcomes has come a diverse set of environmental attitude and behavior scales. However, there are few well-established outcome scales in use in the

[3] This chapter is included for partial fulfillment of the quantitative methods in social sciences degree emphasis.

environmental domain, likely due to the many outcomes relevant to sustainability and climate change issues such as issue-specific environmental attitudes (e.g., recycling, water conservation), policy related attitudes and behaviors, and a host of individual-level sustainability behaviors. The two most common environmental attitude scales are the new ecological paradigm (NEP; Dunlap, 2008) and the connectedness to nature scale (CNS; Mayer & Frantz, 2004), but there are few behavioral intentions or behavioral scales used in more than one study. Often, behavioral scales are developed for a specific research question (e.g., recycling behavior; Seacat & Northrup, 2010) and serve that purpose well (see Furr, 2011 for further discussion of the use and limitations of ad hoc scales in social psychological research). However, most environmental behavior intention and behavior scales have not been well validated and are too specific for my goals of measuring more general pro-environmental behaviors. Thus, I created a new environmental behavior intentions measure by modifying a recently established sustainability behavioral scale (i.e., the reoccurring pro-environmental behavioral scale, REBS; Brick, Sherman, & Kim, 2017) and assessed the scale's validity of measuring pro-environmental behavior intentions.

REBS and REBIS

The reoccurring pro-environmental behavior scale (REBS) was recently proposed and used as a measure of voluntary pro-environmental behaviors among citizens of industrialized countries (Brick et al., 2017). The scale went through extensive development, including item qualitative feedback from participants and item selection (see Brick, 2015). The REBS was designed to maximize ecological validity and included both curtailment behaviors (e.g., How often do you turn electronics off?) as well as efficiency behaviors (e.g., How often do you buy high efficiency light bulbs?), and included 21 different behaviors (see

Appendix C for full scale). As constructed, the scale functions as a measurement of existing pro-environmental behavior tendencies, but as discussed earlier, it cannot measure changes in pro-environmental behaviors immediately after a manipulation since any attitudinal changes from a study would not be well reflected by a measure that asks about historical pro-environmental behavior. To address this problem, I designed the reoccurring environmental behavior intentions scale (REBIS) to measure environmental behavior intentions for the next week. By using intentions (e.g., I will use reusable shopping bags more than I usually do), the REBIS can potentially capture changes in pro-environmental behavior intentions resulting from study manipulations and takes advantage of the item selection process conducted for the REBS. I propose that the REBIS measures an individual's intentions towards engaging in behaviors that can help protect the natural environment during the next week.

Rasch Modeling

Psychometric analyses provide support for proposed measurement models; in other words, they help provide evidence of how well a given scale measures a psychological construct of interest. There are multiple measurement models and corresponding analyses available to researchers (Wilson, 2003), but the Rasch modeling approach (Rasch, 1960) has some advantages for evaluating the validity of the REBIS in measuring pro-environmental behavior intentions.

One distinguishing feature of Rasch modeling from more traditional psychometric approaches within psychology is that the model tests how well the data fit the proposed characteristics of the measurement model as opposed to how well the measurement model fits the observed data (Wilson, 2003). In this way, well-fitting items in a Rasch framework

indicate that the items support the proposed measurement model. This approach often is more useful when a researcher is developing items to measure a target construct (which is the case in this chapter), where they can design items intended to fit an a priori measurement model. The alternative approach to fitting a measurement model to the data (e.g., factor analysis) may have the most utility when the researcher has little control over the data and items and needs to best fit the already available data. Rasch models also conceptualize items responses as ordinal data. This is a more accurate conceptualization of data from Likert scales like the REBIS (e.g., 0 *I will do this much less than I usually do*; 4 *I will do this much more than I usually do*) than assuming the data are measured on a continuous scale as other approaches like factor analysis do.

The Rasch model assumes that each individual has some level of a latent trait, often abbreviated as Θ (theta), and that each item on a scale corresponds to a certain trait level where an individual has a 50% chance of endorsing that item[4]. An important aspect of the Rasch model is that each item can relate to a different level of Θ, meaning that some items are more likely to be endorsed by those with lower levels of the trait being measured and other items are more likely to be endorsed by those with higher levels of the trait being measured. Thus, each item can have a different "difficulty." This item difficulty or inflection point is often abbreviated as α (alpha). The relationship between an individual's likelihood of endorsing an item is set as a logistic function of the distance between the item's difficulty and an individual's level of the latent trait. In other words, the measurement model proposes that the likelihood of someone endorsing a certain item is related to whether they are high or

[4] The Rasch model can apply to dichotomous items (e.g., true/false questions) or polytomous items (e.g., any Likert scale). The general Rasch description is discussed in regard to a dichotomous item for ease of explication and expanded to polytomous items in later discussions.

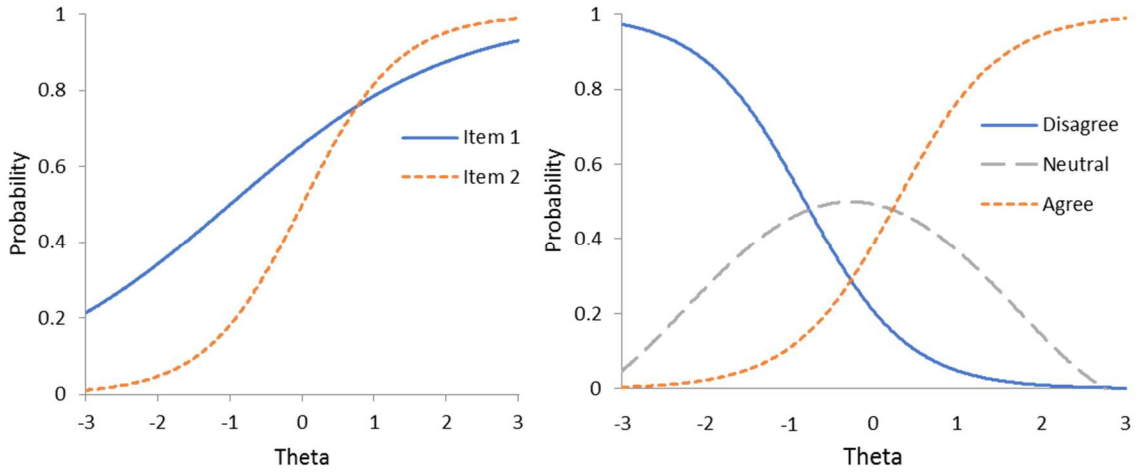
low in the target latent trait. For example, people with greater pro-environmental behavior intentions (their thetas) will be more likely to endorse that they strongly intend to reduce their red meat consumption (an item with a high alpha). Although often unstated, this is the assumed measurement relationship of most psychological scales and why it makes sense to determine if items for the REBIS indeed match this proposed measurement model.

This relationship between individuals' theta (latent trait levels) and items alphas (difficulty of items) is best represented visually with an item characteristic curve (ICC). Figure 2 presents ICCs for two dichotomous items (presented for ease of explication) and a polytomous item (multiple ordered responses such as a Likert scale). On the left panel of Figure 2, two ICCs are displayed for two dichotomous items (e.g., true/false item). The curves show the probability of an individual answering "correctly." A "correct" response corresponds to a higher level of the latent trait. At a Θ of zero, often calibrated to represent the mean level of the latent trait with the scale being in logit units of the latent trait, the ICC shows that there is a higher probability of an individual answering correctly for item 1 than for item 2, about .7 versus .6 probability. The ICCs also demonstrate another important measurement feature of the Rasch model, that items and item responses are in a consistent order. For example, those with lower levels of a latent trait are expected to be more likely to respond to a response option such as "disagree" than a response option of "agree." These ICCs show that item 1 is an easier item to endorse than item 2. Or in other words, those with lower levels of the latent construct will be more likely to endorse item 1 than item 2.

Further, the entire curve of the ICC provides important information on how well the item functions across the spectrum of the latent ability. We see that item 1 has a less steep slope, meaning it is less discriminating than item 2. Rasch modeling can also be applied to

polytomous items, or scales with multiple ordered response items. The right panel of Figure 2 presents the ICC for a polytomous item, where each response option for a given question has its own probability curve. Just as with the dichotomous item, the curves represent the probability of an individual endorsing a scale response given their Θ level. For polytomous items, the peaks of the various response options should be ordered in the predicted direction (e.g., "strongly disagree" before "disagree," "disagree" before "neutral," etc.). This represents an item with scale responses that can discriminate between different individuals of different Θ levels. In the example provided in Figure 2, those with a Θ below -1 are most likely to endorse the "disagree" option, those with a Θ between -1 and 1 are most likely to endorse the "neutral" option, and those with a Θ above 1 are most likely to endorse the "agree" option.

Figure 2. Item characteristic curves for two dichotomous items (left panel) and a polytomous item (right panel). Curves show the probability that participants at a given level of theta will endorse that item or response option.



The Rasch model can evaluate the difficulty of a given item and its responses (often referred to as item difficulty), an advantage when measuring different environmental

behaviors as some behaviors may be more readily done and are less costly, meaning that they are "easier" behaviors to do. For example, it is relatively easy and low cost to unplug electronics than to reduce travel by car; thus, endorsements to do more of each of these behaviors are not equivalent. People much lower in attitude strength towards engaging in pro-environmental behaviors might be more likely to endorse unplugging electronics more than reducing their travel by car. A Rasch analysis allows for a direct investigation of how each item and the item responses relate to different levels of the latent ability being measured, which provides important information on how different individual pro-environmental behaviors relate to the underlying latent construct. An extension of this item difficulty estimation is that the overall scale can be evaluated for different levels of Θ, so one can determine how well the scale measures the latent construct for those higher or lower in the trait (as observed through test information). A final advantage to the Rasch model is that its parameters are not dependent on the sample, which is not true of measurement approaches that seek to fit models to the data and not data to the models. As long as the same latent construct is being measured, Rasch analyses can be applied across and within different populations (Reeve, 2002). Further, this means different samples can be combined, assuming the same scale is used, since the analyses are assumed to be population invariant (Reeve, 2002).

Methods

Data for the current Rasch analysis come from two separate studies that included the REBIS measure. Both samples being combined for the current analyses are very similar in nature and there is no reason to expect that the items would be measuring different latent constructs in each sample, thus there is justification to combine the samples.

Participants and procedure

The combined sample consisted of 500 undergraduate students completing an online survey for course credit. These samples are from Study 5 (n = 279) and Study 6 (n = 221). Full sample characteristics are presented in the next chapter. For polytomous items, a minimum of 250 responses is recommended, with 500 being the preferred sample for an Rasch analyses (Jiang, Wang, & Weiss, 2016; Reeve & Fayers, 2005).

REBIS

The REBIS is comprised of items taken from the REBS, which were modified to measure intentions to engage in a given pro-environmental behavior in the future. Further, five behaviors from the REBS scale were not included since they were not likely to be relevant to a student population (e.g., driving slower than 60 mph; eat from a home vegetable garden). The final REBIS included 16 behaviors (e.g., Use reusable shopping bags, compost food garbage, use a reusable water bottle), where participants were instructed, "For each behavior, report how likely you are to increase or decrease how frequently you do the behavior in the next week." Participants then indicated their likelihood of doing the given behavior in the future on a five-point Likert scale from 0 *I will do this much less than I usually do* to 4 *I will do this much more than I usually do*. Participants could also select that the behavior was "Not applicable to me." For behaviors that were not applicable, they were not included in the analyses[5]. The full scale is presented in Appendix C.

Results

First, I first justify my model selection. Next, I investigated item response

[5] Less than 5% of participants reported that a behavior was not applicable. When data are missing for Rasch analysis, the item for which there is missing data will not be analyzed, but the rest of the participant's data are retained in the analysis; missing data does not require list-wise deletion.

frequencies. I then assessed items and their associated fit and functioning. Finally, I examined the overall functioning of the scale.

Model selection

There are two primary Rasch models available for scales with polytomous response options (i.e., rating scale and partial credit scale models). The partial credit model differs from the rating scale model in that it does not hold constant that the difficulty-of-endorsement between response options is approximately equal. In the context of the REBIS, the response options are the same for all items and were designed to reflect relatively equal steps in terms of difficulty. Thus, there is no strong reason to model these differences (Linacre, 1998), which is what the partial credit model does, leading me to choose the rating scale model for the analysis.

Response frequencies

In order for a Rasch model to evaluate scale measurement, there need to be sufficient responses at each item response level. One potential concern for the REBIS among the current sample of undergraduates is that few would report intentions to engage in less of a specific pro-environmental behavior. Eleven of the sixteen items had fewer than 10 responses for the lowest response option, *I will do much less of this behavior.* Without more data for this response option, the Rasch model cannot accurately estimate the measurement of the scale. As a result, I collapsed the two lowest scale response options for the following analysis.

Estimated item parameters

The rating scale model provides item difficulty ratings, item fit statistics (infit and outfit), and item-total correlation discrimination (see Table 8). Fit statistics are calculated for

each item. These item fit statistics are a tool for investigating how well responses correspond with the expectations of the model (i.e., do the data match the Rasch measurement model). Reasonable infit and outfit values were calculated to be between 0.87 and 1.27[6]; mean square (MNSQ) values above 1 indicate underfit (i.e., item does not discriminate well) and MNSQ values below 1 indicate overfit (i.e., item discriminates better than expected) (Wright & Linacre, 1994).

The model finds generally acceptable infit and outfit MNSQ values, but there are some items with lower than desired MNSQ values. MNSQ values lower than 1.00 indicate that the item responses are too predictable and that the data overfit the model. The four items with significant underfit are "use reusable bags", "buy organic food", "buy local food", "buy environmentally-friendly clothing", and "conserve water." These items are all somewhat related to consumer purchasing decisions, and it may be that they are redundant and not all add useful data to evaluate the measurement model. However, they will not adversely affect measurement evaluation. MNSQ values above 1.00 can distort the measurement evaluation, and only one items was slightly above the threshold for underfit (by 0.01), "reducing meat consumption". Although this item almost reaches the acceptable fit range, it should still be a potential target for revision to reduce underfit.

The item-total *r* or discrimination parameter was also used to assess item fit. This statistic correlates the value of the given item with the total score calculated without the given item, where values > .40 are considered to represent strong fit with the scale (Clark & Watson, 1995). All items meet this criterion. Nevertheless, the meat and dairy consumption

[6] The item-fit range was based on the formula provided by Wu and Adams (2013): $1 \pm 2\sqrt{\frac{2}{N}}$

items had the lowest item-total *r* values of .46 and .49, respectively, meaning that they contributed the least amount of information on discriminating between someone with high or low behavioral intentions. Based off infit and outfit MNSQ values and item-total correlations, nearly all items of the scale exhibited adequate fit to the measurement model.

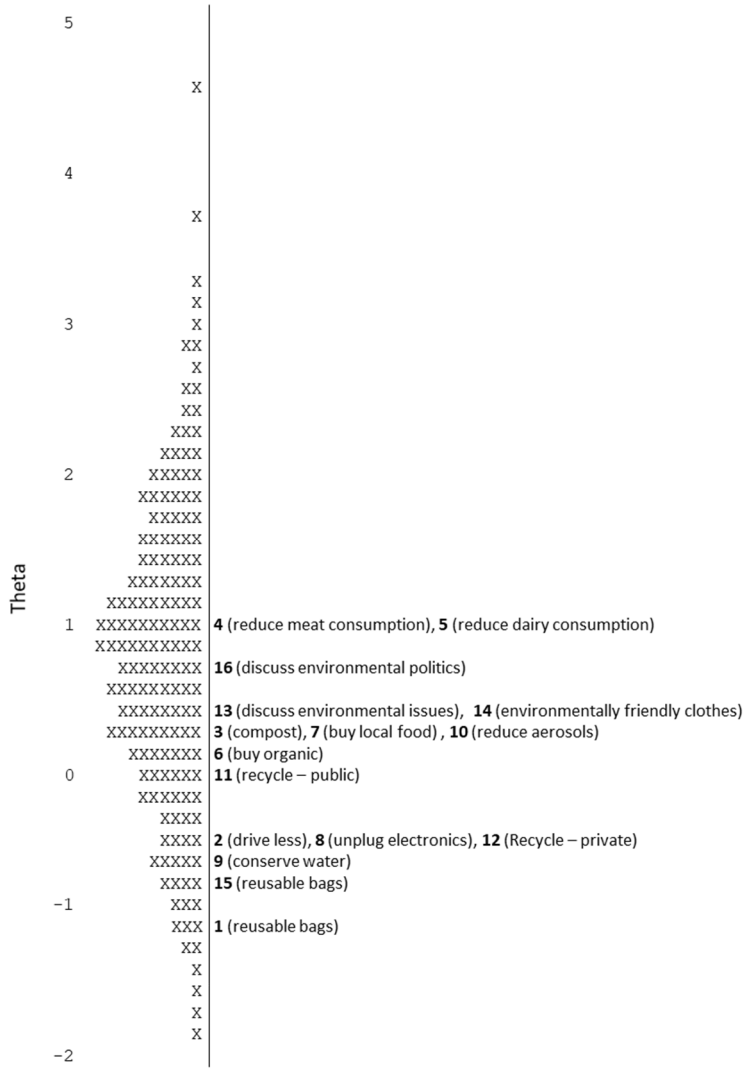
Table 8. Rasch model item fit and parameter estimates

Item	Measure score	Item-total *r*	Item fit	
			Infit MNSQ	Outfit MNSQ
1. Use reusable bags	-1.00	.69	0.90	0.86
2. Reduce car use	-0.53	.64	1.08	1.04
3. Compost	0.22	.58	1.04	1.01
4. Reduce meat consumption	0.90	.46	1.28	1.24
5. Reduce dairy consumption	1.01	.49	1.20	1.14
6. Buy organic	0.03	.68	0.86	0.83
7. Buy local food	0.17	.66	0.77	0.75
8. Unplug electric devices	-0.50	.62	0.98	0.97
9. Water conservation	-0.65	.68	0.77	0.79
10. Reduce aerosol use	0.28	.66	1.07	1.05
11. Recycle in public	-0.13	.61	1.14	1.12
12. Recycle in private	-0.44	.66	0.97	0.94
13. Discuss environmental issues	0.42	.57	0.95	0.95
14. Buy environmentally-friendly clothing	0.32	.63	0.85	0.81
15. Use reusable water bottle	-0.85	.62	1.11	1.10
16. Discuss environmental politics	0.72	.58	0.91	0.89

The measure score provides information on how difficult an item was, with lower scores meaning that an item was relatively easier to endorse (i.e., those with lower intentions are more likely to endorse it) than those with high scores. The difficulty scores ranged from -0.95 to 0.90. The item most likely to be endorsed by those low in behavioral intentions was using reusable shopping bags, and the item least likely to be endorsed by those low in behavioral intentions was reducing dairy consumption. This pattern makes some intuitive sense given that reusing bags is a relatively easier behavior to intend to do than reducing

dairy consumption. The wright map in Figure 3 provides a comparison between the distribution of individuals at their measured levels of behavioral intentions (theta, left panel) and the average difficultly of the REBIS items (right panel). The map shows two notable findings. First, the items are clustered near the lower theta ranges, suggesting that they are relatively easier to endorse (i.e., even those relatively lower in behavioral intentions are endorsing the item). Second, most of the observed high theta values did not have items that would discriminate between these individuals (i.e., no items are located near the upper half of the theta distribution. This means that the sample exhibited fairly high pro-environmental behavioral intentions. Given the location of the items, the REBIS items were "easy" to endorse among this sample.

Figure 3. Wright map comparing the distribution of individuals at their measured levels of behavioral intentions (left of vertical axis) and the average difficultly of the REBIS items (right of vertical axis). Each X represents 3.1 cases.

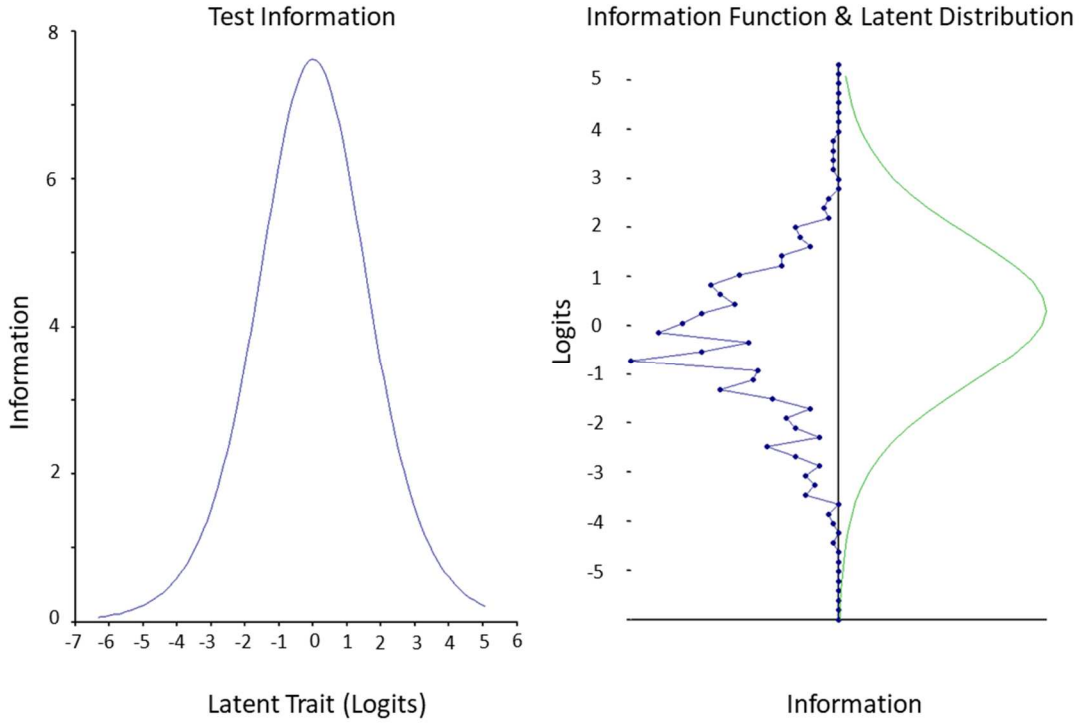


Test information

In addition to looking at specific item functioning, Rasch analyses also provide summary information for the entire scale. Figure 4 presents two plots, the test information and information and latent distribution plots. The test information (left panel) provides relative information on how well the scale can distinguish between individuals at different

levels of the latent trait. The REBIS provided most information at average to slightly below average levels of pro-environmental behavior intentions. Thus, the scale was most precise at estimating pro-environmental intentions among those low followed by those more average in pro-environmental intentions. The scale provided much less information about those very high or very low in pro-environmental intentions. The information function and latent distribution (right panel) compares the test information curve to observed data points, revealing that most of the scale's observed data were around the average ability and slightly below, matching the information curve. This suggests that more observed data contributed to greater test information; this is not particularly surprising but cannot always be assumed.

Figure 4. Total REBI test information. Left panel shows the relative test information across the latent trait spectrum. The right panel shows the test information (curve) along with the observed data (points).



Discussion

Overall, the Rasch analysis supported that the REBIS successfully measured pro-environmental behavior intentions. However, it also revealed important limitations and insights regarding the current scale construction. The overall item fit statistics and scale information did not reveal major fit and functioning issues that would suggest the overall scale and items did not measure pro-environmental intentions. Some items may be redundant and not contribute much information, but they do not negatively impact the measurement. Nevertheless, deeper inspection of the results did identify three areas for scale and measurement improvement.

The first area for improvement is that the meat and dairy consumption items had the lowest discrimination values and had some degree of underfit. That is, they did not discriminate well between people at different levels of pro-environmental intentions. This may be because people do not often think of their diet choices as environmental decisions, and thus, diet behaviors and intentions would not correspond to environmental values. However, correlations presented in the forthcoming Study 4 do suggest some relationship between pro-environmental values and meat-eating frequency. Thus, students may be rather mixed on whether they view diet choices as environmentally relevant, undermining the ability of the diet questions in assessing environmental behavior intentions. Further, the meat and dairy items were the "hardest" items to endorse (as can be seen with Figure 3). Thus it may be worthwhile to keep these items, but revise the question wording to help increase discrimination. For example, the questions might ask more explicitly about changing dietary habits as an intentional effort to reduce greenhouse gas emissions.

A second area for revision would be to add more behavior scale items. Other environmental behavior scales have used up to 40 behaviors in their measurement (Kaiser, Oerke, & Bogner, 2007). Also, more difficult behaviors (e.g., not taking long-haul flights) can help provide more scale items that better discriminate between individuals with high pro-environmental behavior intentions. Another route to increasing the amount of discrimination at higher levels of behavior intentions would be to expand the current scale response options. The current scale found that most participants responded with "no change," doing behavior "more," or doing behavior "much more." By including more endorsement options in this range, the items may be better able to discriminate among people who have average and above average pro-environmental intentions For example, a revised scale may have item response options including: I would never change how much I do this behavior, I will not likely change how much I do this behavior, I may do this behavior only slightly more, I may do this behavior more, I may do this behavior much more, I will take every opportunity to do this behavior more.

Finally, it is important to consider the unidimensionality of a behavior scale measuring pro-environmental behaviors. Prior work with the REBS supported a single behavioral dimension. Although the REBIS and REBS are distinct scales, they use the same behaviors and there does not seem to be a clear multidimensional structure. However, if more behaviors are added to future versions of this scale as I suggested, it will be important to revisit the question of dimensionality. Often dimensionality is based on face validity (Furr, 2011), but this assumption has consequences for the ability of Rasch analyses to successfully analyze scale items. Treating a multidimensional scale as a unidimensional scale will result in poor item fit. Other research that has investigated broader and a greater number of pro-

environmental behaviors has indeed found support for different dimensions of environmental behaviors (i.e., lifestyle behaviors, social environmentalism, envionmental citizenship, and land stewardship; Larson, Stedman, Cooper, & Decker, 2015). Although this study identified different behavioral categories, it still relied on only three to four behaviors to represent each category. Future work will need to both consider multidimensionality as well as make an effort to compile a more comprehensive list of potential pro-environmental behaviors.

Limitations

Before discussing the broader implications of the findings of this chapter, it is important to recognize the limitations of the current validity assessment of the REBIS. The Rasch analysis provided support that the data from the REBIS generally fit with the proposed Rasch measurement model. However, these results do not indicate whether the scale items are actually measuring behavioral intentions or some other latent construct that has the same measurement properties. Although the scale questions and response items provide face validity for the scale measuring pro-environmental behavior intentions, a more systematic conceptual and empirical investigation the REBIS would provide more comprehensive validation for the scale. Following the framework detailed by Wilson (2005) provides a structured approach to defining a construct, designing items, determining an outcome space, and selecting a measurement model. This approach, complemented with pilot studies and other scale testing procedures such as "think-alouds" (Ericsson & Simon, 1980) may provide further insights into measuring pro-environmental behavior intentions. Additional empirical work looking at how the REBIS is related to other established environmental outcomes would also provide important convergent and divergent validity.

It is also important to consider the sample used to evaluate the measurement model. The sample was comprised of undergraduate students from a Californian university. Thus, they are likely pro-environment and already engage in many pro-environmental behaviors. This presents two primary limitations. First, if students are already engaging in many pro-environmental behaviors, it restricts the variability they can exhibit on changing pro-environmental behavior intentions in response to appeals for greater intentions (i.e., a ceiling effect). Second, as observed in the data, there are few students who are anti-environment and report intending to do fewer pro-environmental behaviors. Without individuals in the sample at these lower levels of pro-environmental behavior intentions, the measurement model cannot be fully tested. Future validation efforts will need to include a more diverse sample, particularly in regard to varying levels of pro-environmental behavioral intentions.

The challenge of measuring environmental behavior

Measurement across the field of psychology and within the environmental domain is difficult. The constructs being measured are not directly observable and are often complex. However, these challenges should be a signal for the importance of thoughtful discussions of measurement and psychometric analyses. Instead, it appears that these challenges are often set aside and sometimes not even discussed. A recent systematic review of empirical articles published in the *Journal of Personality and Social Psychology* found that of 433 scales designed to measure psychological constructs, about half contained no citation to any validation study and 20% reported no psychometric information (Fried & Flake, 2018). Despite the growth of social psychological research in the environmental domain (and

corresponding growth of new psychological scales) there are few psychometric evaluations of these scales.[7]

If researchers' assumptions are incorrect about the ability of their scales to measure the construct of interest, an interesting set of results may be misleading as the construct of interest is not what it is believed to be. The consequences of using poor functioning scales goes beyond potentially invalidating the findings of a single paper as these scales are often used in subsequent studies. This can lead to mixed findings and contribute to difficulties with replication (Fried & Flake, 2018). Proper measurement practices should be emphasized broadly within psychology, but particularly in the environmental domain where new scales are being rapidly developed as this domain of psychology continues to grow.

Another challenge to measuring environmental behavior is the conceptualization of what a measure of environmental behavior represents. There are at least two main functions an environmental behavior scale can serve. The first is that it can be a measurement of an underlying latent construct like pro-environmental attitudes, which is how I conceptualize the REBIS. I believe that environmental behaviors are often assumed to represent underlying pro-environmental attitudes. When we think of someone who cares about the environment, we assume that they do behaviors that express their beliefs. From this logic, it makes sense to use behaviors to measure this latent construct, but as the results from this chapter show, it is important to carefully test how specific behaviors and an overall behavior scale might actually map onto pro-environmental attitudes and behavior intentions.

[7] There are exceptions. The NEP and CNS have been evaluated multiple times (Dunlap et al., 2000; Hawcroft & Milfont, 2010; Mayer & Frantz, 2004; Perrin & Benassi, 2009), and some other new scales have received thorough psychometric evaluations (e.g., Alisat & Riemer, 2015; Kaiser et al., 2007).

A behavioral scale can also be used to simply measure what behaviors an individual does, without any assumptions of those behaviors' relationships to any underlying latent psychological constructs. These types of measures are important for studies trying to determine simply how often individuals engage in pro-environmental behavior. There are two challenges to these types of scales. The first is that they are subject to bias. As discussed in the preceding paragraph, environmental behaviors can measure pro-environmental attitudes. Thus, a scale seeking to measure objective environmental behavior from self-reports has the risk of unintentionally measuring pro-environmental attitudes, which could bias the scale. It is likely someone higher in pro-environmental attitudes may over-report their pro-environmental behaviors and someone lower in pro-environmental attitudes may under report. This could be a function both of social desirability bias and in skewed perceptions of individuals' own behaviors, potentially reporting behaviors to verify their self-concept. This problem is shared across self-report behavioral scales (King & Bruner, 2000), and the best solution is to try and measure observable behavior whenever possible.

A second challenge with measuring objective pro-environmental behavior is that many environmental behaviors are influenced by external factors. The attitudes-behaviors-constraint theory emphasizes the strong role context and external constraints play in individuals' ability to actually engage in pro-environmental behaviors (Guagnano, Stern, & Dietz, 1995). Thus, objective behaviors scales, and to some degree behavior scales designed to measure pro-environmental attitudes, need to be able to account for these contextual constraints. I attempted to do this in the REBIS by allowing participants to indicate a behavior was not applicable to them. However, this may be an overly simplistic way to

address contextual constraints. While there is no easy solution, this is a concern that should be considered in continued environmental behavior scales.

Behavior-based environmental attitude

Psychological measurement, and the psychometric analyses that evaluate such measurement efforts, rest on the assumption that a certain set of items in a questionnaire represent a latent psychological factor (de Ayala, 2009). Thus, before any psychometric analyses are done, it is important to consider if a certain set of items, such as engaging in environmental behaviors, represent a latent variable, such as pro-environmental attitudes.

The attitude-behavior gap common observed in environmental research, the findings that environmental attitudes and related constructs only weakly predict behaviors (Bamberg & Möser, 2007; Hines et al., 1987), raises concerns about whether environmental behaviors or behavioral intentions represent individuals' actual attitudes toward the environment. In other words, might the prediction gap between attitudes and behaviors be because the behaviors do not represent the attitudes. Prior work, however, has argued for and found support for a scale consisting of a variety of environmental behaviors to represent individuals' pro-environmental attitudes (Kaiser et al., 2007). As these researchers point out, a single behavior with implications for the environment, such as eating less red meat, can have multiple determinants, including pro-environmental attitudes, desire to save money, or being more healthy. Thus, single behaviors may have a weak relationship with pro-environmental attitudes. However, individuals with more positive pro-environmental attitudes will likely engage in multiple pro-environmental behaviors as an expression of their pro-environmental attitude. Using behavioral self-reports of over 900 adolescents, researchers created an environmental attitude scale that consisted of 40 different pro-

environmental behaviors adolescents might engage in (e.g., I switch off lights, I buy products in refillable packages, I separate waste, I tried to persuade my parents to buy an energy-efficient car). Using both Rasch modeling and factor analysis, the researchers found that their scale of environmental behaviors had high reliability, suggesting that the different behavior items measured a latent variable of pro-environmental attitudes. Further, the behavior-based attitudes scale had high convergent validity with conventional scales of environmental behavior. Although this scale had strong psychometric properties, its items were tailored for an adolescent population, limiting its generalizability to other populations, particularly adults. Nonetheless, this study suggests that a scale consisting of multiple environmental behaviors can measure pro-environmental attitudes, and also helps to explain why the relationships between attitudes and single environmental behaviors may be weak.

Conclusion

The Rasch analysis provided psychometric support for the validity of the REBIS in measuring individuals intentions toward engaging in behaviors that can help protect the natural environment. Although not all items functioned as desired, the scale overall appeared to function well, providing preliminary support for the use of the scale in measuring pro-environmental behavior intentions. This chapter also speaks in part to larger concerns about how well environmental behaviors are measured and how researchers conceptualize environmental behavior measurement. It is beyond the scope of this dissertation to develop an entirely new approach to conceptualizing and measuring environmental attitudes and behaviors, but I hope that this chapter adds to the discussions on what the conceptual roles are of environmental behavior scales, what limitations and challenges exist in measuring

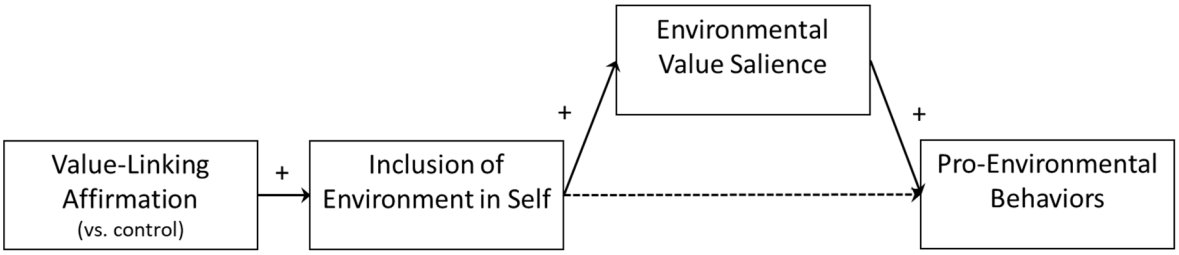
environmental attitudes and behaviors, and the importance of recognizing and addressing these limitations in the environmental psychology domain.

Chapter 4: Linking Most Important Values to Environmental Values

The first three studies found that greater environmental value salience was positively associated with self-reported environmental behaviors above and beyond environmental value ratings and rankings. The implication of this finding is that increasing the inclusion of environmental values in the self (reflected in greater value salience), may be a potential means to increasing pro-environmental behaviors. Studies 4-6 test a modified self-affirmation manipulation that was designed to increase inclusion of environmental values in the self by creating a link between individuals' most important value and environmental values.

Self-affirmation theory considers how affirming personal values can be used to reduce defensiveness and facilitate behavior change (Sherman & Cohen, 2006). However, this approach (sometimes called a values affirmation) has not been conceptually linked with larger theories of values. Viewing self-affirmation theory through the lens of general value theories (Rokeach, 1973; Schwartz, 2012) and considering the results of Studies 1-3, provides new insights about the value-behavior relationship and how to leverage this relationship to change behaviors. I propose that a value-linking affirmation, where individuals affirm their most important value and then write about how environmental values are related to that value, leads to behavior change through a causal process model (see Figure 5). I predict the linking affirmation will increase perceptions of the inclusion of environmental values in the self (i.e., perceptions of how close environmental values are to one's most important value). The more environmental values are included in the self, the more individuals are predicted to think about environmental values and, in turn, the more likely they are to engage in pro-environmental behaviors.

Figure 5. Theoretical process model of the relationship between the linking affirmation and behavior change.



Self-affirmation theory posits that individuals are motivated to maintain an overall perception of adequacy, that they are engaging in rational and adaptive behaviors (Sherman & Cohen, 2006; Steele, 1988). As a consequence, individuals will resist engaging with information that might challenge this perception of overall adequacy, which is reflected in a number of potential defensive responses such as message derogation or denial. However, if individuals reflect on important personal values before facing potentially threatening information, they can affirm their overall sense of adequacy and reduce the threat posed by information that may suggest, for example, that certain behaviors they are doing are maladaptive. Self-affirmation interventions have been used in both the educational and health domains to change behavior. In the classroom, it has been shown to reduce the educational achievement gap (measured in GPA) between minority and white students (e.g., Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Sherman et al., 2013). In regard to health outcomes, two meta-analyses have found a consistent small-to-medium effect of self-affirmation on behavior change (Epton, Harris, Kane, van Koningsbruggen, & Sheeran, 2015; Sweeney & Moyer, 2015). However, there have been three published papers on affirmation in the environmental domain, which together have mixed results regarding the ability of affirmation to lead to consistent pro-environmental outcomes (Sparks, Jessop,

Chapman, & Holmes, 2010; van Prooijen & Sparks, 2014; van Prooijen, Sparks, & Jessop, 2012). I review components of self-affirmation theory to try to make sense of these disparate findings as I have done with other affirmation work (i.e., investigating mixed findings from combined implementation intentions and self-affirmation manipulations; Ehret & Sherman, 2017), and propose how the linking affirmation may be able to address the limitations of the current applications of self-affirmation in the environmental domain.

A prerequisite for the ability of self-affirmation to reduce defensiveness and facilitate behavior change is the presence of a self-threat. Self-threats are perceptions that something about oneself is deficient or inappropriate. These might manifest in the classroom as minority students' concerns that they do not belong in the classroom and are not capable of being a good student (i.e., stereotype threat, Steele & Aronson, 1995), or they could manifest in heavy drinkers' refusals to learn about the health damages inflicted by his or her alcohol consumption. Self-threats can lead to a variety of defensive responses that can prevent behavior change or lead to maladaptive behaviors (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). Self-affirmation, by affirming an individual's overall self-integrity, can provide necessary resources and a broader construal of the self which can buffer against self-threats (Sherman & Hartson, 2011; Wakslak & Trope, 2009). Inherent to these mechanisms leading to reductions in defensiveness and behavior change, however, is the presence of a threat.

Self-affirmation in the absence of a self-threat may have no effect or backfire by reducing persuasion. In one study (Jaremka, Bunyan, Collins, & Sherman, 2011), researchers instructed participants in one condition write about secrets they were keeping from their partner and were then told that partners often eventually discover these secrets; this

introduced a relationship-based self-threat. The other condition did not write about any secrets. Participants were then assigned to complete either an affirmation or control writing task. There was only an effect of self-affirmation among participants in the relationship-threat condition and who had low self-esteem such that those who were affirmed distanced themselves less from their partner. Those with low self-esteem were predicted to be vulnerable to the relationship threat, and thus they were the population for which the self-affirmation could buffer against the induced threat. There was no difference between the control condition and self-affirmation condition for those in the no threat condition and with higher self-esteem since there was no self-threat for those individuals. In another study that tested the effects of self-affirmation in the absence of self-threat, the researchers found that affirmation lead to overconfidence and less processing of persuasive messages (Briñol, Petty, & Demarree, 2007). Thus, the affirmation backfired as individuals were less engaged with persuasive messages and more overconfident in prior beliefs, undermining the ability of the messages to potentially change behavior. These studies emphasize the need to consider whether a self-threat is present or not in understanding whether self-affirmation will have the predicted effects of decreasing defensiveness and facilitating behavior change. Just because a study is related to a potentially threatening domain, like the environmental domain, does not mean that all participants will perceive self-threats. For example, measuring beliefs in climate change may not evoke self-threats, but having participants read an article about the severe risks of unmitigated greenhouse gas emissions might. Providing a specific threatening

message is often needed to ensure participants are threatened, instead of assuming threat is present[8].

When self-threat is present, the effects of self-affirmation on behavior change are believed to be driven by a decoupling process where affirmation helps to break the link between potential threats and the self. If the link between a threat and the self is broken, then individuals are less likely to experience the potential threats in their environments (Sherman & Hartson, 2011). This decoupling can be observed through the attenuation of the relationship between prior threat-related beliefs and behavioral outcomes and attitudes related to targeted outcomes (e.g., academic fit in the classroom, message acceptance in the health context). The first study to show the attenuation effect found that among affirmed sports team members, that the affirmation reduced the relationship between self-serving judgements and judgements about the team (Sherman & Kim, 2005). Non-affirmed team members were more likely to ascribe wins to internal causes and losses to external causes, whereas affirmed members did not differ in their internal versus external attributions for team performance. This attenuation effect has also been observed among students who completed affirmations in the classroom; affirmed students had weaker relationships between perceptions of identity threat and academic fit. Considering identity threat was high, on average, attenuating the link between threat and academic fit was a beneficial outcome allowing students to feel like they "fit in" even when faced with threats to their identity (Sherman et al., 2013). Similar attenuation effects have been found in the health domain where patients at higher health risks were more likely to derogate health messages, and this

[8] An exception might be contexts where prior empirical work has shown threat in a given context is high, such as stereotype threat in the classroom.

relationship was attenuated with an affirmation manipulation (Koningsbruggen & Das, 2009). Attenuation effects may be beneficial among populations where most individuals report high levels of a belief or a behavior that leads to harmful outcomes. For example, attenuating the link between identity threat and academic fit is beneficial when most minority students are under identity threat, and attenuating the link between health risk and message derogation is beneficial when most patients are at high health risks. However, the benefits of this attenuation relationship are less clear when a population is comprised of those that hold more negative *and* more positive attitudes, as is observed in the environmental domain.

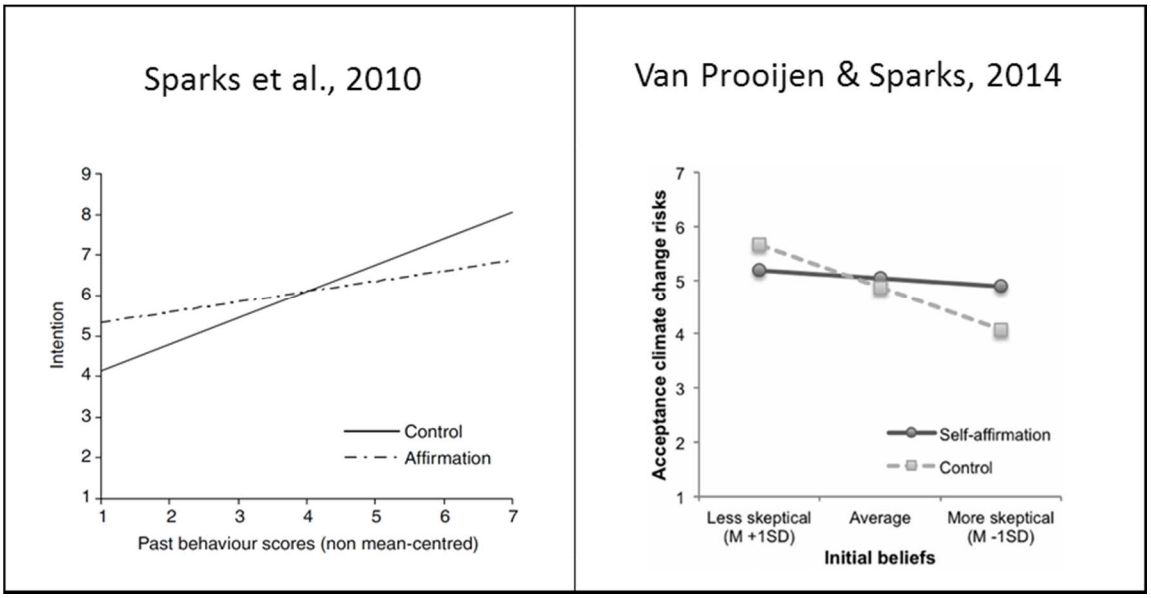
Three studies have tested self-affirmation in the environmental domain. Applying the predicted attenuation pattern to environmental behaviors suggests that self-affirmation would lead those lower in environmental values or attitudes to engage in more environmental behaviors, but those higher in environmental values or attitudes to engage in less environmental behaviors. Nevertheless, the studies applying self-affirmation in the environmental domain shared the goal of using affirmation as a tool to create a net increase in pro-environmental outcomes (Sparks et al., 2010; van Prooijen & Sparks, 2014; van Prooijen et al., 2012)

Two studies found that self-affirmation produced the attenuation effect, where the affirmation reduced the link between prior environmental beliefs or behaviors (prior to the affirmation manipulations) and current assessments of climate change risk or environmental behavioral intentions (Sparks et al., 2010; van Prooijen & Sparks, 2014). These findings emerged in interaction effects (see Figure 6). On one hand, this is a pro-environmental outcome since it suggests that those who deny climate change or do not often engage in

environmental behavior may benefit from affirmation. But on the other hand, it may be harmful as it undoes the beneficial effect prior beliefs or past behaviors have for those with high environmental beliefs or who engage in many pro-environmental behaviors (see Figure 6 for attenuation effects). From these studies, it is not clear self-affirmation provides a net benefit, particularly in the absence of a main effect of self-affirmation as attenuating the link between prior beliefs or behaviors and climate change attitudes or environmental behavior intentions is only beneficial in regard to environmental outcomes for those with low beliefs and potentially harmful for those with high beliefs.

A third study with self-affirmation found that when individuals were affirmed in the absence of a persuasive message, affirmation reinforced prior climate change beliefs (van Prooijen et al., 2012). When compared to the broader affirmation literature reviewed previously, the findings from the three studies are not surprising. Attenuation effects are commonly observed (e.g., Koningsbruggen & Das, 2009; Sherman et al., 2013; Sherman & Kim, 2005) and there is evidence and strong theoretical arguments for the lack of an affirmation effect in a non-threatening context (Jaremka et al., 2011; Sherman & Cohen, 2006). Nevertheless, it raises the question then if self-affirmation is an appropriate intervention approach in the environmental domain where the goal is to create a net beneficial pro-environmental effect (e.g., more recycling among all individuals).

Figure 6. Self-affirmation moderation effects for Sparks et al., 2010 and van Prooijen & Sparks, 2014. The results suggested that while self-affirmation led to more pro-environmental outcomes for those who recycled less or were more skeptical, self-affirmation also attenuated the increase in behavior and acceptance of climate change risk for those who recycled more or were less skeptical of climate change.

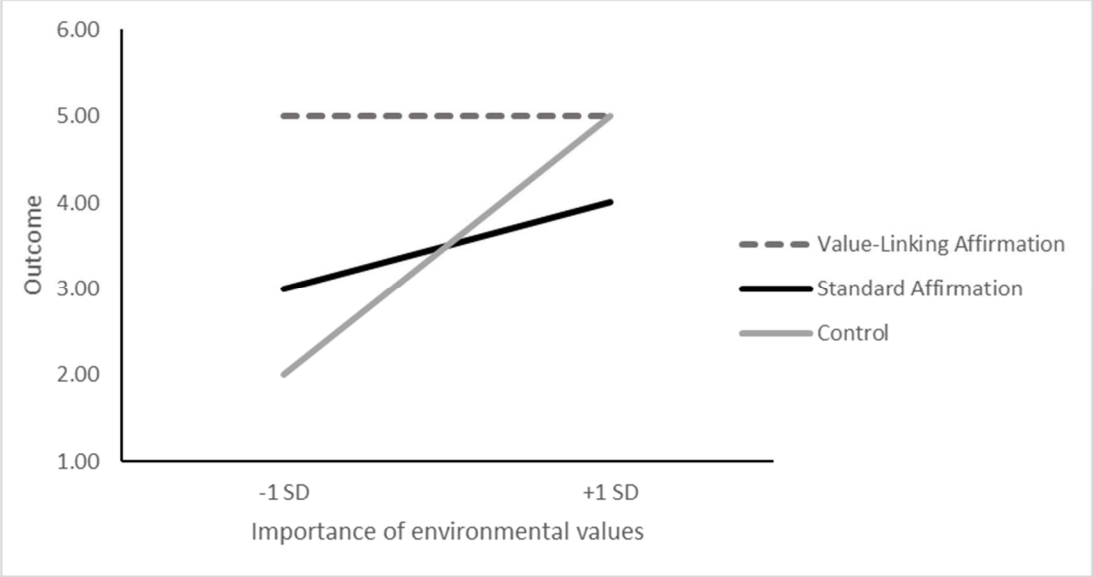


I propose that extending the traditional self-affirmation framework to include a value-linking component can leverage the insights from Studies 1-3 to provide a new means to use affirmations to lead to an overall main effect of a linking affirmation in increasing pro-environmental outcomes. As previously discussed, the traditional affirmation exercise helps to decouple potential threats from the self by increasing construal levels and activating individuals' broader sense of self (Critcher & Dunning, 2015a; Sherman & Hartson, 2011; Wakslak & Trope, 2009). The linking affirmation instructs participants to think about how their most important value they affirmed is related to protecting the environment and try to create an explicit connection between the two. There are two benefits of having participants complete this linking task immediately after an affirmation. First, it may be easier to make a

link given the broader sense of self and higher levels of construal. Second, the value link may be more meaningful given that their overall self-integrity is bolstered, reducing any potential resistance to engaging in the task and thus facilitating deeper engagement. Linking environmental values to individuals' most important values, values that likely permeate many aspects of individuals' lives, may lead to people thinking about environmental values more frequently, which Studies 1-3 showed was related to greater pro-environmental behaviors.

In general, I predicted that the value-linking affirmation would exhibit a main effect on environmental outcomes in the direction of individuals thinking about environmental values more frequently (i.e., greater value salience), engaging in more pro-environmental behaviors, and reporting stronger pro-environmental attitudes. Further, I predicted the mechanism underlying the effects of the linking affirmation on salience would be how close individuals felt that environmental values were to their most important value (i.e., inclusion of environmental values in the self). For the traditional self-affirmation, I predicted that the affirmation task compared to the control task would replicate the attenuation effect described earlier. The predictions are graphed in Figure 7 and show how the linking affirmation may be able to potentially counteract the affirmation attenuation effect in the environmental domain by leading all participants regardless of prior environmental attitudes to intend to and actually do more pro-environmental behaviors.

Figure 7. Predicted main effect of the value-linking affirmation and the attenuation effect of the standard affirmation writing compared to the control writing condition.



I tested my predictions with three experiments. In Study 4, participants were asked to complete a value writing task where they completed a standard self-affirmation essay, a control writing task, or the value-linking affirmation essays. Next, they read an article about the need to reduce red meat consumption to fight climate change. I measured participants environmental value salience, self-reported red meat consumption, and general environmental behaviors one week later. The longitudinal design allowed me to examine self-reported behavior change after the manipulations, but it also was important as it allowed me to measure changes in value salience resulting from the manipulation. The effects of the linking affirmation on salience could only emerge after participants were allowed to have sufficient time to think (or not think) about environment values. In Study 5, participants completed the same tasks as in Study 4, except that the value-linking affirmation was revised to help participants more successfully link environmental values to their most important values. Participants then read an article about the need to act regarding climate change and

then general environmental behaviors were measured one week later. The REBIS, which was the focus of Chapter 3, was used in this study to improve the measurement of general environmental behavior intentions. In Study 6, participants again completed the same writing tasks as in Study 5, but they were assigned to read either a non-threatening or threatening climate change article. General environmental behavior intentions were measured with the REBIS after reading the article. The linking affirmation, across Studies 4-6, increased participants' self-reported inclusion of environmental values in the self (i.e., how close participants believe environmental values were to their most important value) which was in turn related to greater environmental value salience and general pro-environmental behaviors.

Study 4

Study 4 provided the first test of the value-linking affirmation—compared to the standard values affirmation and control writing task—in increasing the perceived connection between environmental values and individuals' most important values. Further, it tested how the value-linking affirmation was then related to both general pro-environmental behaviors and red meat consumption. Red meat consumption was selected as an outcome of interest because it is a daily behavior that has important environmental consequences (Stehfest et al., 2009). Since most individuals eat multiple meals per day, this allowed me to test whether the value-linking affirmation could influence this daily environmental behavior.

Design and participants

Study 4 was a longitudinal experiment where participants completed the first survey in a psychology laboratory and the follow-up on their computer at a location of their choice. Participants (N = 289) were undergraduates participating for course credit that all reported

eating red meat in a typical week. A screening question was used in the subject pool screening questionnaire to ensure all participants were not vegetarians and ate red meat. The sample was 70.9% female (n = 205) and 29.1% male (n = 84). Ethnicity varied: 43.0% Caucasian (n = 120), 33.3% Asian (n = 93), 22.3% other or multiracial (n = 62), and 1.4% Black (n = 4). Further, 26.1% (n = 75) reported they were Hispanic/Latino(a). Participants were, on average, 18.69 years old (SD = 1.27). There was no attrition; all participants completed both surveys.

Although an undergraduate participant sample limits the generalizability of the study findings (Arnett, 2008; Henrich et al., 2010), it also provides two important advantages over conducting the experiments with an MTurk sample. First, online experiments with MTurk populations often exhibit differential attrition across conditions (Zhou & Fishbach, 2016), which violates random assignment, a serious problem undermining any causal interpretations. Given that the manipulations in the current study were not trivial and required varying degrees of effort to respond to the writing prompts, this attrition would likely be a concern among an MTurk sample. Second, the diversity of an MTurk sample introduces more variability among which environmental behaviors are applicable to participants. For example, recycling programs are not available in all areas of the country and not all participant own cars or have access to public transportation. Thus, a behavior scale that asks about a broad range of environmental behaviors, will have varying applicability to a more diverse population, limiting my ability to detect changes in behaviors. A student sample provides a more consistent behavioral context in which to study pro-environmental behaviors, particularly in my research laid out in this chapter which is focused

on testing the effects of the linking affirmation task, and not on a comprehensive measurement of pro-environmental behaviors.

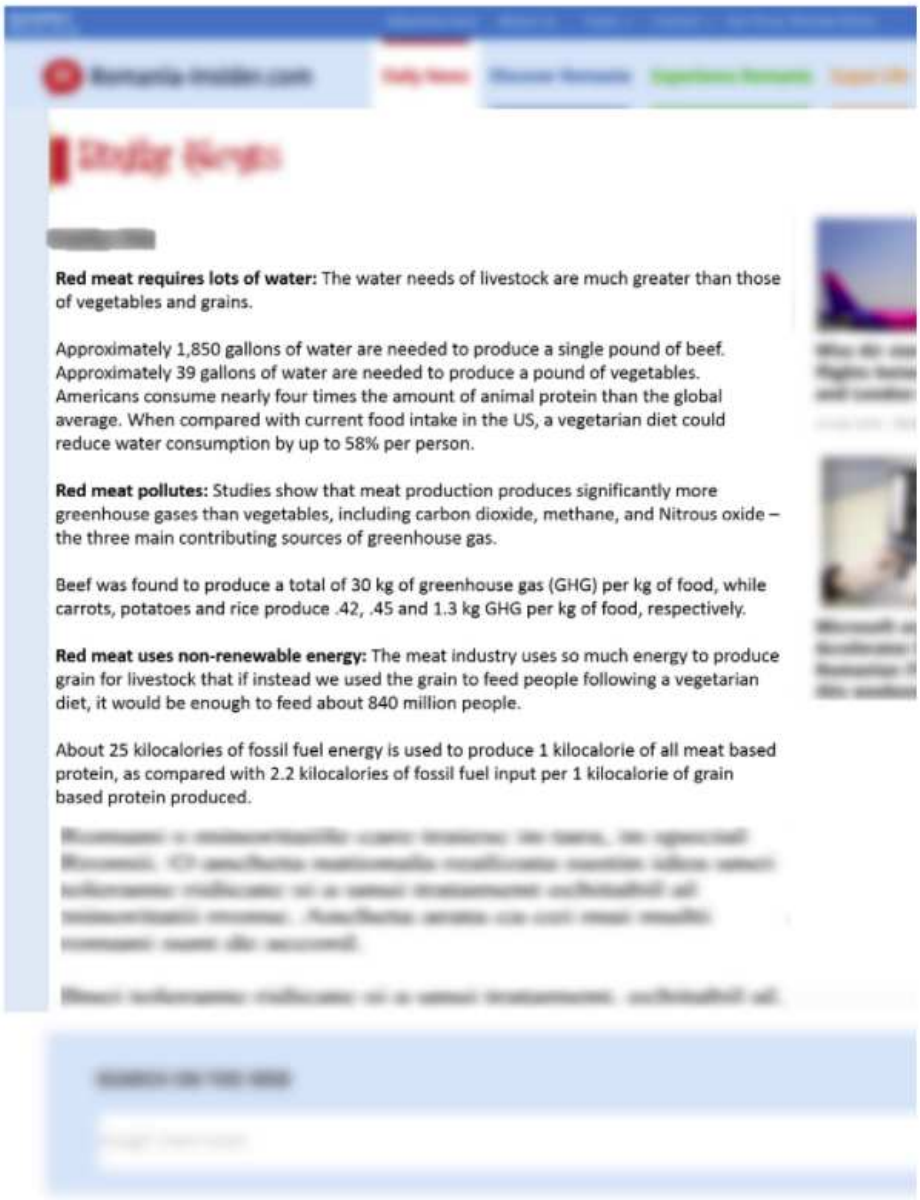
For the current and all subsequent studies, I recruited the most participants I could given available person power and resources during a given study recruitment window. My post-hoc power analysis for Study 4 found that I was I was fully powered to detect regression coefficients of $f^2 \geq .02$ in a regression with six predictors, a small effect size (Faul et al., 2007). This was the most conservative effect size estimate; all other analyses were powered to detect at least small effect sizes.

Procedure and scales

After agreeing to the information sheet, participants completed questions about frequencies of daily behaviors and rated a series of important life values, including environmental values. Next, participants were randomized to ether the value-linking affirmation condition, the standard affirmation condition, or a control writing condition. Next, all participants read an article about the environmental impacts of red meat consumption, see Figure 8. Participants then completed scales of importance of reducing red meat consumption, beliefs about environmental consequences of red meat consumption, intentions to eat red meat, general environmental behaviors, and a measure of inclusion of environmental values in the self. They also completed a demographics questionnaire.

One week after participating in the first session, participants were emailed a follow-up survey that included questions about value salience, value ratings, meat consumption, inclusion of environment in the self, and general environmental behaviors over the past week.

Figure 8. Environmental consequences of red meat consumption article.



Red meat requires lots of water: The water needs of livestock are much greater than those of vegetables and grains.

Approximately 1,850 gallons of water are needed to produce a single pound of beef. Approximately 39 gallons of water are needed to produce a pound of vegetables. Americans consume nearly four times the amount of animal protein than the global average. When compared with current food intake in the US, a vegetarian diet could reduce water consumption by up to 58% per person.

Red meat pollutes: Studies show that meat production produces significantly more greenhouse gases than vegetables, including carbon dioxide, methane, and Nitrous oxide – the three main contributing sources of greenhouse gas.

Beef was found to produce a total of 30 kg of greenhouse gas (GHG) per kg of food, while carrots, potatoes and rice produce .42, .45 and 1.3 kg GHG per kg of food, respectively.

Red meat uses non-renewable energy: The meat industry uses so much energy to produce grain for livestock that if instead we used the grain to feed people following a vegetarian diet, it would be enough to feed about 840 million people.

About 25 kilocalories of fossil fuel energy is used to produce 1 kilocalorie of all meat based protein, as compared with 2.2 kilocalories of fossil fuel input per 1 kilocalorie of grain based protein produced.

Affirmation manipulations. The values essay manipulation was used for the self-affirmation condition (Sherman & Cohen, 2006). Participants were first told to rank a list of

values[9] in order of their importance to themselves. Next, they were reminded of the value they ranked as most important and were asked to spend two to five minutes writing about why that value is important and meaningful to them. After completing the essay, participants then wrote the top two reasons why their selected value was important to them.

The value-linking affirmation had participants complete the same values writing tasks as those in the self-affirmation condition, but included an additional writing prompt. After selecting their most important value and writing the essay and top two reasons their selected value was important, participants were then instructed to write about how their most important value was related to protecting the environment:

> "Next we would like you to think about how protecting the environment is related to your most important value of '*Most important value*'. How is protecting the environment related to your most important value, or how does protecting the environment help you embody your most important value?
>
> Sometimes this takes a few seconds to think through how these values are related. Try and think about times or roles in your life where protecting the environment was important to you and how that may be related to your most important value of "*Most important value*'."

The control condition asked participants to rank the same values as in the other two conditions, but instead asked participants to write about why their second to least important value was important to someone else. This is a commonly used control task in the affirmation paradigm (Sherman & Cohen, 2006).

Pre-manipulation meat consumption. Before the manipulations, two single items were used to measure pre-intervention meat consumption frequency. Two items asked how

[9] Values include: Artistic skills, athletics, business/earning money, creativity, independence, musical ability/appreciation, politics, relations with family and friends, religious values, sense of humor, spontaneity/living life in the moment.

frequently you "eat red meat (beef)" and "eat any type of meat, poultry, or fish" in a typical week. These two items were included with four other distractor items asking about frequency of washing clothes, watching TV, going on the internet, and exercising. Participants responded to each item on a five-point scale from 1 *Never* to 5 *Multiple times a day*.

Pre-manipulation environmental value ratings. After reporting on the frequency of the selected behaviors, participants rated the importance of 11 values using the same value rating scale as Studies 1-3. Values included: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, security, and protecting the environment. Each value was accompanied by an explanatory phrase (e.g., "PROTECTING THE ENVIRONMENT (looking after the environment, caring for nature, saving natural resources)"), and participants indicated the importance of the value on a seven-point Likert scale from 1 *Not important* to 7 *Of supreme importance*. The value of interest was "protecting the environment," and the other values were included to reduce bias in value importance reporting.

Importance of reducing red meat consumption. After reading the article, participants responded to four questions regarding the importance of reducing red meat consumption (e.g., "It is important for me to reduce my red meat consumption."). Participants responded on a six-point Likert scale from 1 *Strongly disagree* to 6 *Strongly agree* ($\alpha = .87$).

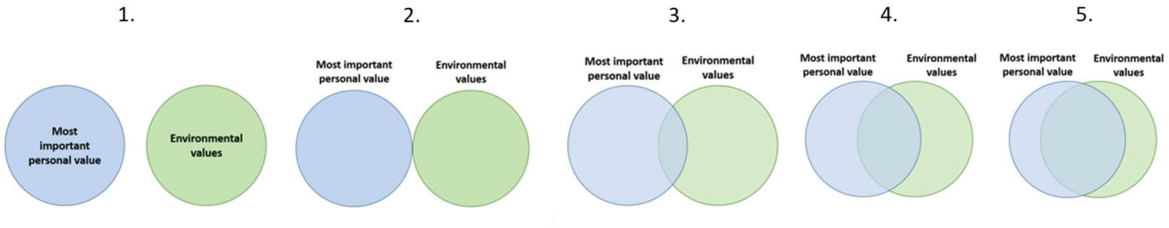
Red meat consumption consequences. Participants also reported their beliefs about the environmental consequences of red meat consumption by responding to four items (e.g., "Eating red meat has serious negative impacts on the environment." Participants responded on a six-point Likert scale from 1 *Strongly disagree* to 6 *Strongly agree* ($\alpha = .92$).

Red meat consumption intentions. Participants were also asked to report their intentions for eating any type of red meat in the seven days following their participation in the study. Participants reported the number of meals that would contain red meat for each of the seven days following the study. These responses were summed to provide a measure of how many red meat meals participants intended to eat.

General pro-environmental behavior intentions. Participants also reported general environmental behavior intentions by responding how much they intended to do ten different pro-environmental behaviors (e.g., "reuse plastic bags before disposing of them," "Turning of the lights when no one is in the room") on a seven-point Likert scale, from 1 *Never* to 7 *Always.* Importantly, this scale had low reliability ($\alpha = .58$). The REBIS discussed in Chapter 3 was not used in this study. The poor reliability of the current scale motivated the use of the reoccurring environmental behavioral scale in the following studies.

Inclusion of environmental values in the self. Participants indicated how much overlap there was between environmental values and their most important value by selecting which image of overlapping circles best represented the inclusion of environment in the self. Participants were reminded of the value they ranked as most important in the writing tasks and were presented the five images displayed in Figure 9. This measure was based off of the inclusion of other in self scale (Aron, Aron, & Smollan, 1992).

Figure 9. Inclusion of environmental values in the self scale. Participants select the set of circles that best represents the relationship between environmental values and their most important personal value.



Follow-up scales. At the follow-up survey, participants self-reported red meat meals, general environmental behaviors, and how frequently they thought about environmental values (i.e., environmental value salience). Following the same structure as red meat meal intentions, participants reported how many meals they actually ate that contained red meat in the seven days after the experiment. These responses were summed to create a count of total meals containing red meat. Participants also self-reported how frequently they did each of the environmental behaviors in the seven days after the first session. The scale at the follow-up also had low reliability ($\alpha = .54$). Finally, participants indicated how much they thought about each of the values previously used in the value rating scale. The scale was the same environmental value salience scale used in Studies 1-3, except that the instructions read: "Please indicate how much you thought about each of the values in the past 7 days." Also, the scale points now ranged from 1 *I never thought about this* to 7 *I almost always thought about this*. All scales are fully reported in Appendix D.

General analytic plan

Studies 4-6 all followed the same general analytic plan. First, descriptive statistics and correlations were calculated for all variables. Next, ANOVAs tested for main effects of

the different writing conditions. A main effect was predicted for affirmation status such that those in the value-linking affirmation would eat less meat and engage in more pro-environmental behaviors than the other conditions. ANCOVAs were used to test for main effects at the follow-up timepoints to control for variables from the first session. A series of regressions were then run that included interaction terms between pre-manipulation environmental value ratings (Studies 4 and 5) and pre-manipulation environmental value salience (Study 5) to test for the predicted attenuate pattern of the standard self-affirmation compared to control writing task. All studies also included path models to test for the indirect effects of the value-linking affirmation on the behavioral outcomes.

Results

First, descriptive statistics and correlations were calculated for the variables of interest, see Table 9 and Table 10. Importantly, pre-study red meat consumption frequency and red meat consumption intentions were significantly and negatively correlated with importance of reducing red meat consumption (r = -.23, p < .001; r = -.33, p < .001), beliefs about environmental consequences of red meat consumption (r = -.13, p = .023; r = -.27, p < .001), general environmental behaviors intentions (r = -.15, p =.010; r = -.19, p = .001), and general environmental behaviors at the follow-up (r = -.16, p = .006; r = -.12, p = .044). This suggested that red meat consumption did have a relationship with environmental outcomes. However, pre-study red meat consumption and red meat intentions were not correlated with inclusion of environment in the self during the first session (r = -.07, p = .232; r = -.01, p = .890) or at the follow-up (r = -.06, p = .305; r = -.04, p = .914).

Table 9. Means and standard deviations for Study 4

	M (*SD*)
Environmental value rating	4.64 (1.36)
Pre-study red meat consumption	2.73 (1.00)
Importance of reducing red meat consumption	3.66 (1.06)
Consequences of red meat consumption	4.24 (1.55)
Red meat meal intentions	5.57 (4.65)
General pro-environmental behavior intentions	4.95 (0.68)
Inclusion of environment in self	2.66 (1.11)
Red meat meals at follow-up	6.07 (5.44)
Inclusion of environment in self at follow-up	2.72 (1.01)
Environmental value salience at follow-up	3.84 (1.56)
General pro-environmental behaviors at follow-up	4.73 (0.72)

Table 10. Correlations for Study 4

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Environmental value rating	—									
2. Pre-study red meat consumption	-.14*	—								
3. Importance of reducing red meat consumption	.30***	-.23***	—							
4. Consequences of red meat consumption	.23***	-.13*	.61***	—						
5. Red meat meal intentions	-.05	.60***	-.33***	-.27***	—					
6. General pro-environmental behavior intentions	.34***	-.12**	.32***	.21***	-.19**	—				
7. Inclusion of environment in self	.31***	-.07	.19**	.13*	.01	.19**	—			
8. Red meat meals at follow-up	-.15***	.59***	-.31***	-.22***	.65***	-.18**	-.03	—		
9. Inclusion of environment in self at follow-up	.37***	-.06	.21***	.14*	-.01	.19**	.74***	-.01	—	
10. Inclusion of environment in self at follow-up	.44***	-.09	.35***	.18**	-.01	.28***	.36***	-.07	.38***	—
11. General pro-environmental behaviors at follow-up	.36***	-.16**	.27***	.16**	-.12*	.74***	.19**	-.12*	.21***	.36***

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

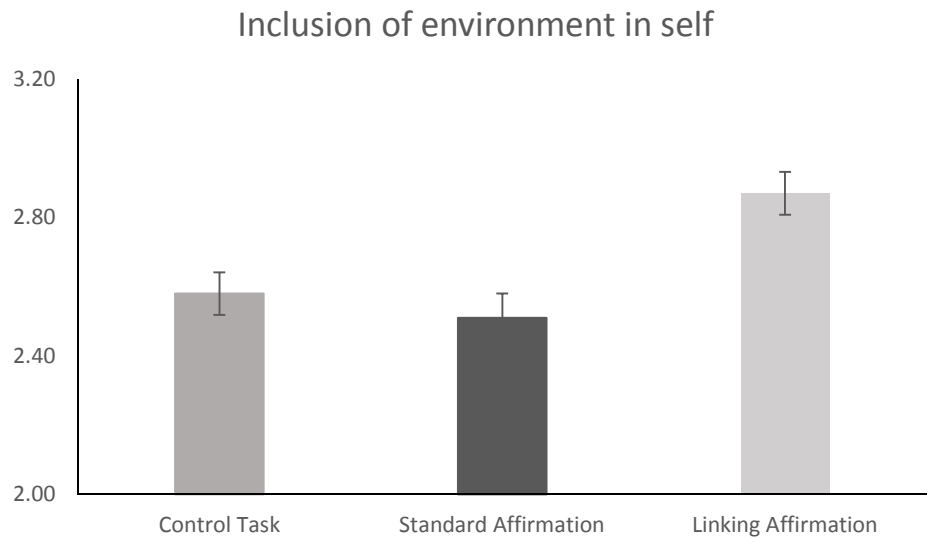
Next a series of ANOVAs tested for differences between the conditions on importance of reducing red meat consumption, consequences of red meat consumption, red meat meal intentions, general environmental behavior intentions, and inclusion of environment in the self during the first session. Means by conditions and ANOVA tests are presented in Table 11. There was only a significant difference between conditions for inclusion of environment in self ($F(2, 286) = 3.10$, $p = .046$). Tukey HSD post-hoc tests revealed that those in the value-linking condition ($M = 2.87$, $SD = 1.05$) reported greater inclusion of environment in self compared to the self-affirmation condition ($M = 2.51$, $SD = 1.19$, $p = .049$). There was not a significant difference between the value-linking condition and the control condition ($M = 2.58$, $SD = 1.05$, $p = .164$). Means by condition for inclusion of environment in self presented in Figure 10.

Table 11. Means by condition and ANOVAs for Study 4

	Condition *M* (*SD*)			
	Control	Self-affirmation	Value-linking affirmation	*F*
Importance of reducing red meat consumption	3.60 (1.03)	3.66 (1.09)	3.70 (1.07)	0.22
Consequences of red meat consumption	4.14 (1.54)	4.12 (1.27)	4.43 (1.78)	1.32
Red meat meal intentions	5.47 (4.12)	5.57 (4.61)	5.66 (5.13)	0.04
General pro-environmental behavior intentions	4.96 (0.68)	4.93 (0.71)	4.98 (0.67)	0.16
Inclusion of environment in self	2.58 (1.05)	2.51 (1.19)	2.87 (1.05)	3.10*

Note. * $p < .05$.

Figure 10. Mean inclusion of environment in self by conditions. Error bars represented ±1 standard error.



Three ANCOVAs and an additional ANOVA tested for changes at the one-week follow-up by condition. When controlling for pre-study meat eating, there was no difference by condition for red meat meals eaten the week after the study ($F(2, 288) = 0.96$, $p = .385$). When controlling for general pro-environmental intentions, there was no difference in reported environmental behaviors the week after the study ($F(2, 288) = 0.60$, $p = .554$). Similarly, when controlling for session 1 inclusion of environment in self, there was no differences in inclusion of environment in self by condition one week after the study ($F(2, 288) = 0.64$, $p = .526$). These results demonstrate there were no differences by condition one week later, and that there was no additional change one week later in the difference in inclusion of environment in self observed after the first session. A final ANOVA tested and found no difference in environmental value salience at the follow-up by condition ($F(2, 288) = 0.31$, $p = .732$).

A series of multiple linear regressions tested for moderation by environmental value importance. All models included environmental values (mean centered), and two dummy variables representing the three study conditions (self-affirmation: self-affirmation = 1, control = 0; linking affirmation: linking affirmation = 1, control = 0), and the interaction between environmental values and the dummy coded variables. For red meat meal intentions and red meat meals at the follow-up, the models also included a covariate for typical frequency of red meat consumption. For all models, the interactions were plotted, see Figure 11.

There was no evidence of moderation between environmental value ratings and either the self-affirmation or linking affirmation conditions for any of the outcomes (*p*s > .056). There were three interaction terms that were marginally significant. First, there were marginal interactions between environmental rating by linking affirmation compared to control writing predicting general pro-environmental behavior intentions (B = -0.13, SE = 0.07, t = -1.92, p = .056) and self-reported environmental behaviors at the follow-up (B = -0.13, SE = 0.07, t = -1.85, p = .066). The plotted interaction revealed that the linking affirmation attenuated the link between environmental values and the behavioral outcomes. However, there was no main effect of the linking affirmation, thus these results do not match the predictions.

The third marginal interaction was between environmental value ratings and the self-affirmation compared to the control writing predicting red meat meals at the follow-up (B = -0.95, SE = 0.50, t = -1.91, p = .058). The plotted interaction showed that those in the self-affirmation condition had a stronger, negative relationship between environmental ratings and red meat meal consumption, and that there was largely no relationship between

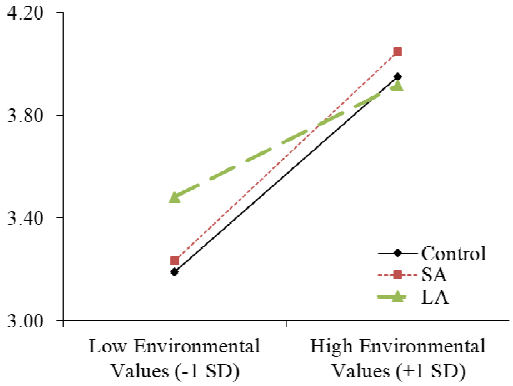
environmental value ratings and meals for those in the linking affirmation condition of the control condition. Considering that none of these marginally significant interactions reached true significance and that there were multiple tests, elevating the potential for type I errors, I conclude that these results do not provide evidence for the predicted interaction effect. There remained a main effect of the linking affirmation increasing the inclusion of environment in self, as was also found above in the ANOVA analyses.

Two series of exploratory moderation analyses were also run. The first series investigated two-way interactions between the writing conditions and general meat consumption measured before the manipulation to test if the effect of the affirmation conditions depended on typical meat consumption. There were no significant two-way interactions. The second series investigated three-way interactions between the writing conditions, environmental value ratings, and general meat consumption. There were no significant three-way interactions. There were some marginal interactions ($ps < .10$), but given these were exploratory analyses, I do not consider these interactions to represent real effects to reduce the chance of type I errors.

*Figure 11. Model coefficients and graphs of the interaction between environmental value ratings and value writing tasks. *** $p < .001$.*

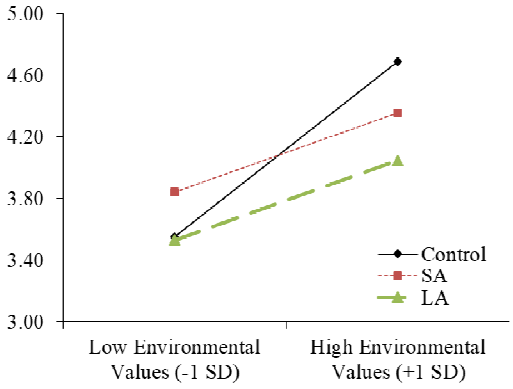
Importance of reducing red meat consumption

	F	R^2	*B* (*SE*)	*p*
	6.21***	.10		
Intercept			3.57 (0.10)	< .001
Environmental value rating			0.28 (0.08)	< .001
Self-affirmation			0.07 (0.15)	.624
Linking affirmation			0.13 (0.15)	.403
Rating X self-affirmation			0.02 (0.12)	.841
Rating X linking affirmation			-0.12 (0.10)	.263



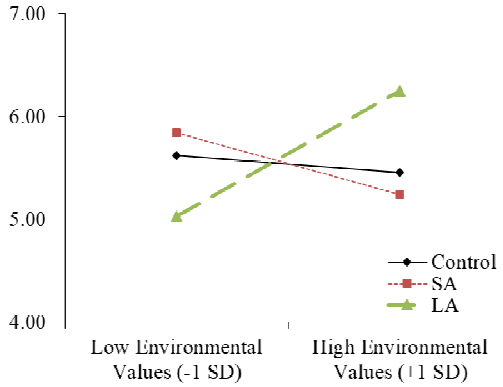
Consequences of red meat consumption

	F	R^2	*B* (*SE*)	*p*
	4.35***	.07		
Intercept			4.12 (0.16)	< .001
Environmental value rating			0.42 (0.12)	< .001
Self-affirmation			-0.02 (0.01)	.994
Linking affirmation			-0.33 (0.22)	.137
Rating X self-affirmation			-0.24 (0.17)	.168
Rating X linking affirmation			-0.23 (0.15)	.141



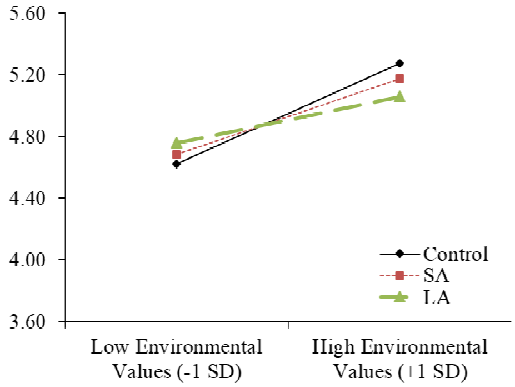
Red meat meal intentions

	F	R^2	*B* (*SE*)	*p*
	27.16***	.37		
Intercept			5.54 (0.41)	< .001
Pre-study red meat consumption			2.82 (0.22)	< .001
Environmental value rating			-0.06 (0.29)	.833
Self-affirmation			0.01 (0.55)	.996
Linking affirmation			0.10 (0.55)	.863
Rating X self-affirmation			-0.16 (0.42)	.702
Rating X linking affirmation			0.51 (0.38)	.185



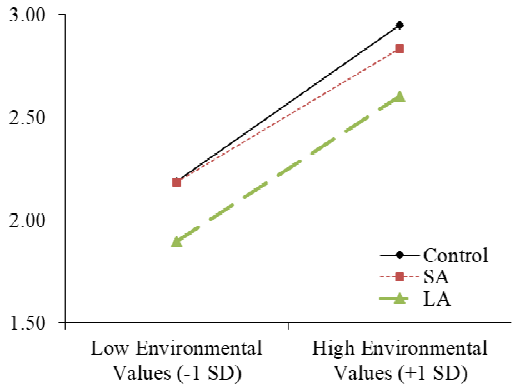
General environmental behavior intentions

	F	R^2	*B* (*SE*)	*p*
	8.27***	.13		
Intercept			4.95 (0.07)	< .001
Environmental value rating			0.24 (0.05)	< .001
Self-affirmation			-0.02 (0.10)	.801
Linking affirmation			-0.04 (0.09)	.688
Rating X self-affirmation			-0.06 (0.07)	.416
Rating X linking affirmation			-0.13 (0.07)	.056



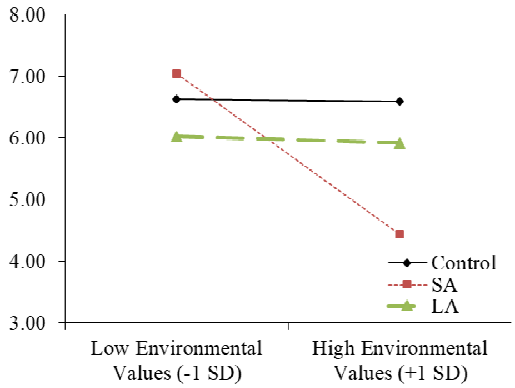
Inclusion of environment in self

	F	R^2	*B* (*SE*)	*p*
	7.93***	.12		
Intercept			2.57 (0.11)	< .001
Environmental value rating			0.28 (0.08)	.001
Self-affirmation			-0.06 (0.15)	.692
Linking affirmation			-0.32 (0.15)	.037
Rating X self-affirmation			-0.04 (0.12)	.715
Rating X linking affirmation			-0.02 (0.11)	.876



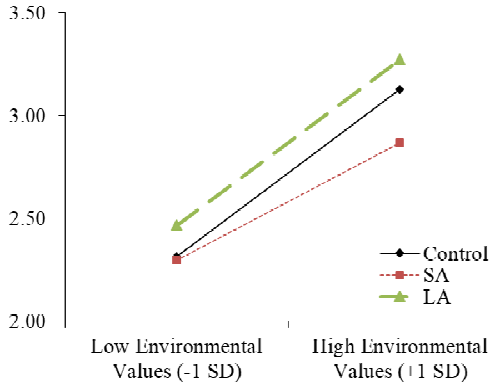
Red meat meals at follow-up

	F	R^2	*B* (*SE*)	*p*
	26.63***	.36		
Intercept			6.61 (0.47)	< .001
Pre-study red meat consumption			3.12 (0.26)	< .001
Environmental value rating			-0.01 (0.34)	.986
Self-affirmation			- 0.87 (0.65)	.181
Linking affirmation			-0.64 (0.64)	.318
Rating X self-affirmation			-0.95 (0.50)	.058
Rating X linking affirmation			-0.03 (0.45)	.942



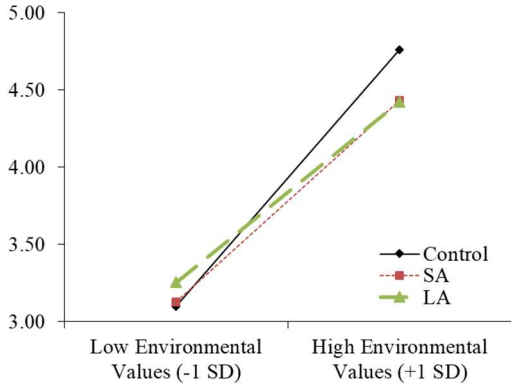
Inclusion of environment in self at follow-up

	F	R^2	*B* (*SE*)	*p*
	10.34***	.16		
Intercept			2.72 (0.10)	< .001
Environmental value rating			0.30 (0.07)	< .001
Self-affirmation			-0.14 (0.14)	.297
Linking affirmation			0.15 (0.14)	.279
Rating X self-affirmation			-0.09 (0.11)	.420
Rating X linking affirmation			-0.01 (0.10)	.974



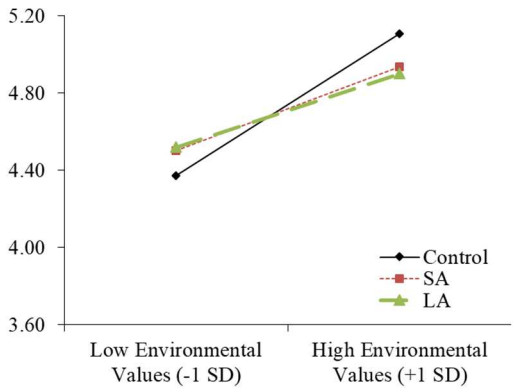
Environmental value salience at follow-up

	F	R^2	*B* (*SE*)	*p*
	13.82***	.20		
Intercept			3.93 (0.15)	< .001
Environmental value rating			0.61 (0.11)	< .001
Self-affirmation			-0.15 (0.21)	.470
Linking affirmation			-0.09 (0.21)	.679
Rating X self-affirmation			-0.13 (0.16)	.413
Rating X linking affirmation			-0.18 (0.14)	.203



General environmental behaviors at follow-up

	F	R^2	*B* (*SE*)	*p*
	9.18***	.14		
Intercept			4.74 (0.07)	< .001
Environmental value rating			0.27 (0.05)	< .001
Self-affirmation			-.02 (0.10)	.825
Linking affirmation			-0.03 (0.10)	.780
Rating X self-affirmation			-0.11 (0.08)	.153
Rating X linking affirmation			-0.13 (0.07)	.066



I also tested for the role in inclusion of environment in self mediating the relationship between linking affirmation and environmental value salience. There was significant mediation such that those in the linking affirmation compared to those in the control and self-affirmation conditions reported that environmental values were closer to their core values, and that the closer environmental values were to their core values the more they thought about environmental values one week later (see Figure 12 and Table 12Table 12. Coefficients for the mediation of the relationship between the linking affirmation and environmental value salience through inclusion of environment in self for model coefficients). Bias corrected (BC) bootstrapping (10,000 samples) found a significant indirect effect (indirect effect= 0.17, bootstrapped *SE* = 0.08, 95% BCCI [0.04, 0.34]).[10] Additional mediation models found an indirect effect of the linking affirmation on general environmental behavioral intentions (indirect effect = 0.04, *SE* = 0.02, 95% CI[0.01, 0.09]), importance of reducing red meat consumption (indirect effect = 0.06, *SE* = 0.03, 95%

[10] The indirect effect was still significant if the reference group was just the control condition and self-affirmation is added as an additional covariate.

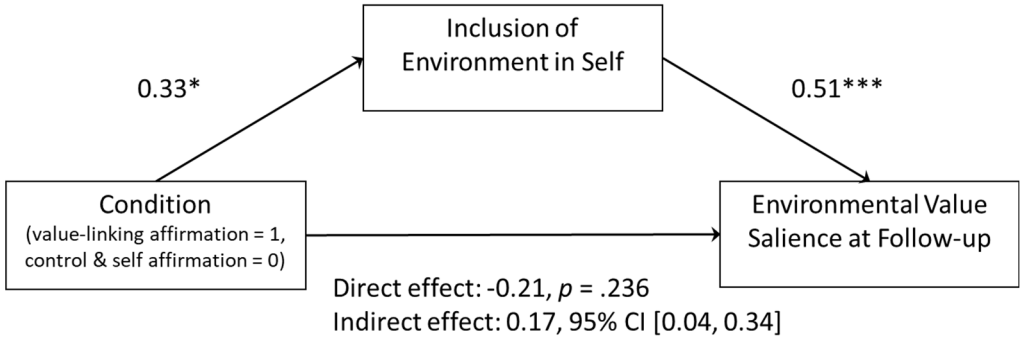
CI[0.01, 0.14]), and consequences of red meat consumption (indirect effect = 0.06, *SE* = 0.04, 95% CI[0.01, 0.17]) through inclusion of environment in self, but not for red meat meal intentions (indirect effect = 0.01, *SE* = 0.09, 95% CI[-0.15, 0.22]). These results demonstrate that the linking affirmation was effective at increasing environmental value salience when it led to greater inclusion of environment in self, as well as increasing behavioral intentions and other attitude scales.

Table 12. Coefficients for the mediation of the relationship between the linking affirmation and environmental value salience through inclusion of environment in self

	DV: Environmental value salience	DV: Inclusion of environment in self	DV: Environmental value salience
	B (*SE*)	*B* (*SE*)	*B* (*SE*)
Intercept	3.86 (0.12)***	2.54 (0.05)***	2.55 (0.23)***
Value-linking affirmation	-0.05 (0.19)	0.33 (0.14)*	-0.22 (0.18)
Inclusion of environment in self			0.51 (0.08)***

Note. Value-linking affirmation compared to control and standard self-affirmation tasks
* $p < .05$, *** $p < .001$.

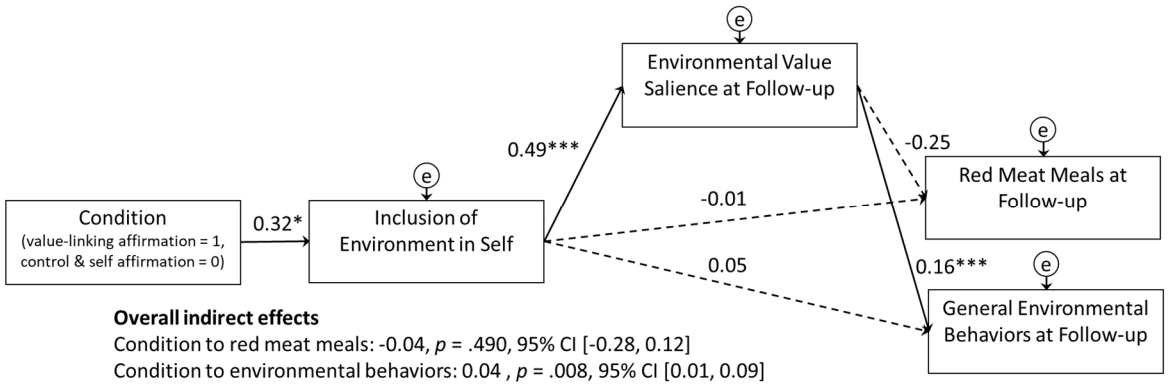
Figure 12. Mediation of the relationship between value-linking affirmation and environmental value salience through inclusion of environment in self.



A path model tested for an overall indirect effect of the linking affirmation writing task compared to the control and affirmation writing tasks on both reported red meat meals

and general environmental behaviors at the follow-up through inclusion of environment in self and salience (see Figure 13). Overall, the model showed good fit (CFI = .99, TLI = .97, RMSEA = .03; Hu & Bentler, 1999). Bootstrapping (10,000 samples, bias corrected) revealed a significant overall indirect effect between the linking affirmation and general pro-environmental behaviors (indirect effect: 0.04, p = .008, bootstrapped SE = 0.02, 95% BCCI [0.01, 0.09]. There was no indirect effect between the linking affirmation and reported red meat meals (indirect effect: -0.04, p = .490, bootstrapped SE = 0.10, 95% CI [-0.28, 0.12]. A model without the salience mediator reported a significant direct effect between inclusion of environment in self and general behaviors (B = 0.12, SE = 0.04, p = .001) but not red meat meals (B = -0.13, SE = 0.29, p = .644).

*Figure 13. Path model demonstrating the indirect relationship between the linking affirmation condition and reported general environmental behaviors one week later. * p < .05, *** p < .001. Non-significant pathways shown in dashed lines. Unstandardized coefficients are displayed.*



These findings may reflect that the linking affirmation was not effective with all participants. To further investigate this issue, the text for actual linking responses was reviewed. Seven students explicitly reported no link between their most important value and environmental

values. Others appeared to have difficulty linking the values. Nevertheless, the majority did appear to successfully link the values. Example written responses are reported in Table 13. Although inclusion of environment in self was conceptualized as a main outcome of interest, if it is reconceptualized as a manipulation check, it can help explain the lack of a direct effect between the linking affirmation and value salience. The linking affirmation was only effective at increasing environmental value salience if it was effective at actually increasing inclusion of environment in self.

Table 13. Example linking affirmation text responses

	Actual written response
Explicitly reported not being able to link environmental values to most important value	"I dont see how theese two are correlated."
	"I don't think these two values have any connection. Maybe trying to protect the environment can prevent me from pissing my friends who care about the environment off."
	"I don't believe that the two are necessarily related"
Appeared to have challenge linking values	"I know that protecting the environment is very important; however, for me I'm not really sure how to start. I know the whole "turn the water off when you're brushing your teeth" or the "turn lights off when not in use" but that doesn't seem like it would eally help in protecting the environment. In high school, I took AP environmental science and I remember my teacher telling me stop using plastic water bottles because plastic is not degradable so they just burn it and burning it emits CO2 back into the ar which in the end traps heat in and after hearing that I told my friends to stop using plastic water bottles."
	"you can make a lot of jokes out of protecting the environment and that is how I associate them."
	"I didn't come from a place that was very conscious of the environment, so this one is hard for me to relate to. But I think that each person's relationship with the environment is strictly between themselves and nature. If you care about the environment, t's because you made an independent and internal decision to uphold that value and respect."
Successfully linked values	"Protecting the environment means protecting the place where I, my friends and family live. When the place we live in is protected, relationships between people become stronger, which is very important to me."
	"My family is very active and loves to go for runs along the beach, through trails, as well as to go camping, hiking, and basically any activity that involves being outdoors. Protecting the environment allows my family to be able to enjoy the beauties of nture. It is important to me to continue to protect the environment so when I have my own family, I can continue to take them to experience all the beauty that nature has to offer. If people don't care to protect the environment, many areas will become poluted, and many already have. Growing up, I lived by the beach and I would always participate in beach clean ups so I could continue to enjoy a trash free beach and keep the ocean "healthy" for all the organisms living in it."
	"Protecting the environment is related to friends and family because they motivate me to be a better person towards society, and that includes cleaning the environment."

Discussion

Study 4 found that the value-linking affirmation had a main effect on inclusion of environment in self such that those who completed the value-linking affirmation believed environmental values to be closer to their most important value than those in the standard affirmation or control writing task conditions. This supported the prediction that the value-linking affirmation task would have a main effect. However, there were no other main effects of any condition on the other outcomes, and there was no evidence of the predicted attenuation from the standard affirmation condition compared to the control condition. The mediation model supported that the increase in inclusion of environment in self from the value-linking affirmation was related to increased environmental salience at the follow-up. This provided evidence that the value-linking affirmation did have a relationship with increased environmental value salience.

Although there were no main effects or interaction effects predicting self-reported red meat consumption or general environmental behaviors, there were indirect effects on behavior. The path model demonstrates that the value-linking affirmation did have a modest effect on self-reported general environmental behavior but not red meat consumption. It is important to recognize, however, that the value-linking affirmation only had an indirect effect on environmental behaviors. This suggests that overall, the value-linking task is not changing behaviors. It is only among those who, as a result of the value-linking writing, perceive environmental values to be closer to their most important value who report engaging in more pro-environmental behaviors. This may reflect that the linking affirmation was not effective for all participants. Indeed, qualitative analysis of the written linking essays show that not all participants were able to link environmental values to their most important

value. This may contribute to the absence of a main effect of the value-linking affirmation on behavior outcomes.

It is also important to consider two important limitations in regard to the behavioral outcomes. First, meat consumption was chosen as an outcome not only for its environmental relevance, but also because it is a daily decision with the assumption there it is a malleable outcome. However, it may be more difficult than anticipated for participants to change their meat consumption patterns. Most students have limited food choice options. They commonly eat at dining halls or eat out with friends where non-meat options may be rare or non-existent. Some have little to no access to kitchens. As such, it may be hard to modify students' diet, particularly because no additional information was provided to help participants actual engage in the behavior change. I have argued before that affirmation-based interventions may not be effective if behavior change is perceived as challenging and participants do not have the behavioral skills needed to successfully change their behaviors (Ehret & Sherman, 2017). Second, the general environmental behavior scale had poor internal reliability, and thus it is unclear if the items of the scale could be considered to measure any stable psychological construct. Thus, future studies relied on REBIS analyzed in Chapter 3 to provide a more reliable and validated measure of general environmental behaviors.

Study 5

Study 5 replicated and extended Study 4 in three primary ways. First, Study 5 used a revised version of the value-linking affirmation manipulation that was designed to help participants successfully link environmental values to their most important value. Second, Study 5 focused on general pro-environmental behaviors and used the REBIS. Third, I

expanded my investigation of the attenuation effect of the standard affirmation by including interactions with pre-manipulation environmental value salience in addition to environmental value ratings. Given that Studies 1-3 identified environmental value salience as being associated with environmental behaviors above and beyond environmental ratings, I decided to test if environmental value salience would interact with the standard affirmation condition to produce the predicted attenuation effects.

Design and participants

Study 5 was a longitudinal experiment where participants completed the first survey in a psychology laboratory and the follow-up on their computer at a location of their choice. Participants (N = 279) were undergraduates participating for course credit. The sample was 77.4% female (n = 216) and 22.6% male (n = 63). Ethnicity varied: 35.1% Caucasian (n = 98), 25.8% Asian (n = 72), 35.5% other or multiracial (n = 99), and 3.6% Black (n = 10). Participants were, on average, 18.89 years old (SD = 1.19). Further, 34.8% (n = 97) reported they were Hispanic/Latino(a). There was little attrition with 94% of participants (n = 262) completing the follow-up survey.

I again computed the most conservative effect size for a single regression coefficient in a multiple regression with six predictors with power of 80%. I was fully powered to detect regression coefficients of $f^2 \geq .02$, a small effect size (Faul et al., 2007). All other analyses were powered to detect at least small effect sizes.

Procedure and scales

Study 5 used the same scales and procedures as Study 4 with three main differences. First, the outcome of interest was general pro-environmental behaviors instead of red meat consumption; I changed outcome scales to reflect this. Second, given the change in the

outcome of interest, I used a new article discussing the risks of climate change. Third, I revised the instructions for the value-linking affirmation.

As with Study 4, participants first rated a series of important life values, including environmental values. Additionally, participants rated the salience of each of the important life values with the same value salience scale used in the follow-up survey for Study 4. Next, participants were randomized to ether the revised value-linking affirmation condition, the standard affirmation condition, or a control writing condition. All participants then read an article about the reality of climate change and the need to take action, see Figure 14. Participants then completed the REBIS, a scale of the importance of taking action to fight climate change, and the measure of inclusion of environment in self used in Study 4. They also completed a demographics questionnaire.

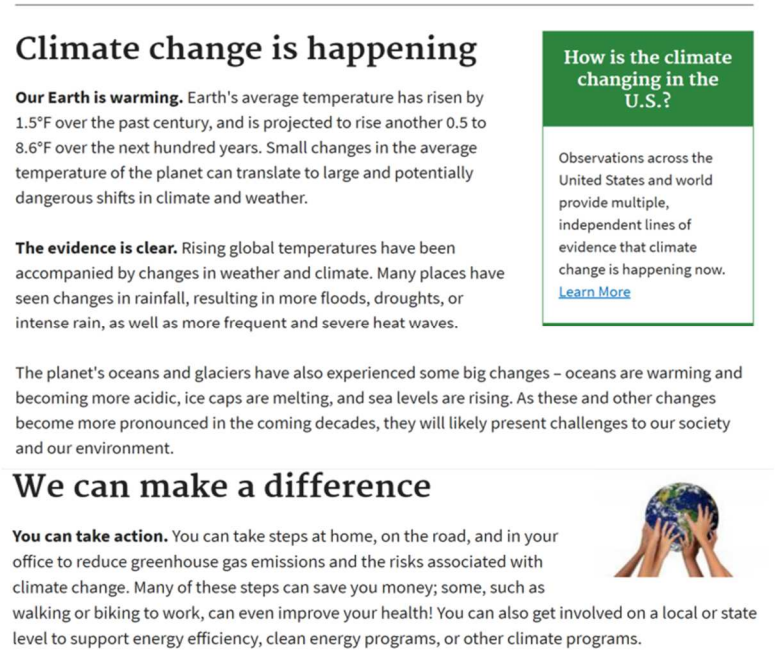
One week after participating in the first session, participants were emailed a follow-up survey that included the REBS questionnaire modified to assess past week behavior, importance of taking action to fight climate change, value salience, value ratings, and inclusion of environment in self. All scales are reported in Appendix D.

Affirmation manipulations. Study 5 used the same affirmation and control writing tasks as in Study 4. The value-linking affirmation manipulation was revised to help participants successfully link environmental values to their most important value. The revised manipulation was the same as the one used in Study 4, but included examples of value links in the instructions.

The instructions read as follows, with the additional paragraph in italics:

> "Next we would like you to think about how protecting the environment is related to your most important value of '*Most important value*'. How is protecting the environment related to your most important value, or how does protecting the environment help you embody your most important value?
>
> *For example, protecting the environment may prevent unhealthy conditions for friends and family. Or protecting the environment may help you enjoy important activities you enjoy like surfing, hiking, or skiing.*
>
> Sometimes this takes a few seconds to think through how these values are related. Try and think about times or roles in your life where protecting the environment was important to you and how that may be related to your most important value of [most important value]."

Figure 14. Climate change article for Study 5.



Climate change is happening

Our Earth is warming. Earth's average temperature has risen by 1.5°F over the past century, and is projected to rise another 0.5 to 8.6°F over the next hundred years. Small changes in the average temperature of the planet can translate to large and potentially dangerous shifts in climate and weather.

The evidence is clear. Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves.

How is the climate changing in the U.S.?

Observations across the United States and world provide multiple, independent lines of evidence that climate change is happening now.
Learn More

The planet's oceans and glaciers have also experienced some big changes – oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. As these and other changes become more pronounced in the coming decades, they will likely present challenges to our society and our environment.

We can make a difference

You can take action. You can take steps at home, on the road, and in your office to reduce greenhouse gas emissions and the risks associated with climate change. Many of these steps can save you money; some, such as walking or biking to work, can even improve your health! You can also get involved on a local or state level to support energy efficiency, clean energy programs, or other climate programs.

Reoccurring environmental behavior intentions. The REBIS scale measured pro-environmental behavior intentions after the manipulations. See Chapter 3 for scale details.

Importance of taking action. Three items were used to measure participants' perceived importance of taking action to fight climate change (e.g., "It is important to find

new ways to fight climate change."). Participants responded on a six-point Likert scale from 1 *Strongly disagree* to 6 *Strongly agree* (α = .92).

Follow-up scales. At the follow-up, participants reported past week general pro-environmental behavior, importance of taking action to fight climate change, value salience, value ratings, and inclusion of environment in self. Pro-environmental behavior was measured with the REBS scale asking specifically about past week behaviors. Importance of taking action and the inclusion of environment in self scale were the same scales as used in the first session. Value salience and value ratings were the same scales as used in the first session with the exception that they asked specifically about the past week. An additional three-item scale of environmental value salience (i.e., environmental value salience composite) was also included in the follow-up survey. The items included: "I find myself thinking about protecting the natural environment on a daily basis," "I am always thinking about ways to protect the planet," and "Ways to protect the environment are always on my mind." Participants responded on a five-point Likert scale from 1 *Strongly disagree* to 5 *Strongly agree* (α = .91).

Results

First, descriptive statistics and correlations were calculated for the variables of interest, see Table 14 and Table 15. All variables were significantly correlated with each other (*p*s < .001). Importantly, there was a strong correlation between the single-item environmental value salience question and the environmental salience composite, which were both measured during the follow-up survey ($r = .61$, $p < .001$), suggesting that these two scales are likely measuring the same latent construct of environmental value salience. Also of note, the environmental value salience scales (single-item salience at session 1 and

follow-up survey, as well as the environmental value salience composite) always had stronger correlations with general environmental behavior intentions and reported environmental behaviors at the follow-up than environmental ratings, replicating the findings from Chapter 2.

Table 14. Means and standard deviations for Study 5

	M (*SD*)
Environmental value rating	5.20 (1.51)
Environmental value salience	4.28 (1.69)
Importance of taking action	5.61 (2.01)
REBIS	1.74 (0.50)
Inclusion of environment in self	2.82 (1.14)
REBS at follow-up	2.36 (0.44)
Inclusion of environment in self at follow-up	2.72 (1.11)
Environmental value salience at follow-up	4.10 (1.48)
Environmental value salience composite at follow-up	3.18 (0.85)

Table 15. Correlations for Study 5

	1.	2.	3.	4.	5.	6.	7.	8.
1. Environmental value rating	—							
2. Environmental value salience	.74***	—						
3. Importance of taking action	.49***	.56***	—					
4. REBIS	.27***	.35***	.36***	—				
5. Inclusion of environment in self	.43***	.51***	.47***	.32***	—			
6. REBS at follow-up	.21***	.25***	.24***	.33***	.22***	—		
7. Inclusion of environment in self at follow-up	.46***	.52***	.51***	.35***	.76***	.32***	—	
8. Environmental value salience at follow-up	.50***	.60***	.39***	-.36***	.40***	.30***	.49***	—
9. Environmental value salience composite at follow-up	.50***	.64***	.42***	.32***	.46***	.48**	.56***	.61***

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

Next a series of ANOVAs tested for differences between the conditions on importance taking action to fight climate change, REBIS, inclusion of environment in self

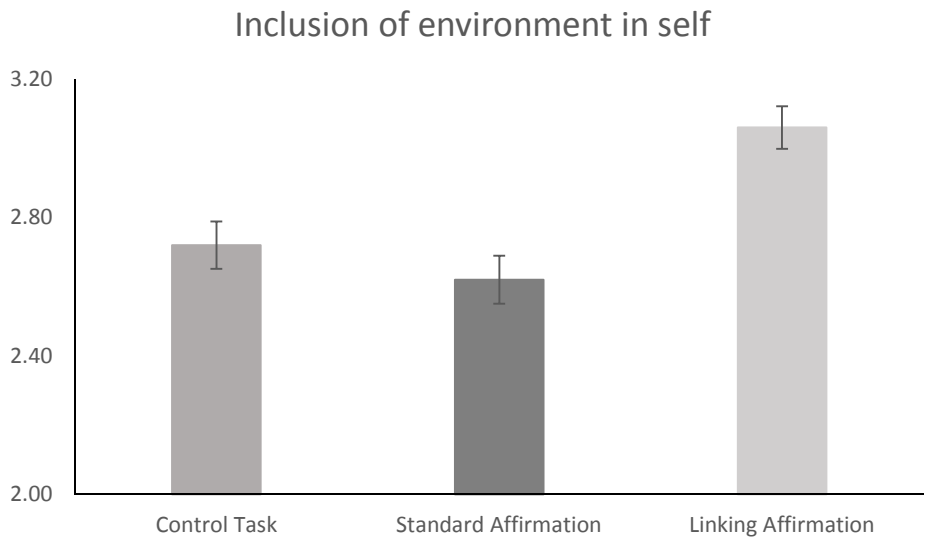
for both surveys, environmental value salience scales, and REBS at the follow up. Means by conditions and ANOVA tests are presented in Table 16. There was only a significant difference between conditions for inclusion of environment in self during the first session ($F(2, 261) = 3.78$, $p = .024$). Tukey HSD post-hoc tests revealed that those in the value-linking condition ($M = 3.06$, $SD = 1.03$) reported greater inclusion of environment in self compared to the self-affirmation condition ($M = 2.62$, $SD = 1.16$, $p = .025$). There was not a significant difference between the value-linking condition and the control condition ($M = 2.72$, $SD = 1.15$, $p = .114$). Means for inclusion of environment in self by condition are presented in Figure 15.

Table 16. Means by condition and ANOVAs for Study 5

	Condition *M* (*SD*)			
	Control	Self-affirmation	Value-linking affirmation	*F*
Importance of taking action	5.65 (2.04)	5.32 (1.87)	5.90 (2.12)	1.85
REBIS	1.74 (0.52)	1.73 (0.51)	1.76 (0.47)	0.14
Inclusion of environment in self	2.72 (1.15)	2.62 (1.16)	3.06 (1.03)	3.78*
General pro-environmental behaviors at follow-up	2.34 (0.49)	2.41 (0.43)	2.32 (0.44)	1.43
Inclusion of environment in self at follow-up	2.65 (1.65)	2.64 (1.14)	2.89 (1.02)	0.70
Environmental value salience at follow-up	4.14 (1.63)	4.00 (1.37)	4.16 (1.45)	0.30
Environmental value salience composite at follow-up	3.14 (1.02)	3.15 (0.83)	3.27 (0.69)	0.98

Note. * $p < .05$.

Figure 15. Means for inclusion of environment in self by condition. Error bars represent ±1 standard error.



As in Study 4, a series of multiple linear regression tested for moderation of writing task effects by environmental value ratings. All models included environmental values (mean centered), and two dummy variables representing the three study conditions (self-affirmation: self-affirmation = 1, control = 0; linking affirmation: linking affirmation = 1, control = 0), and the interaction between environmental values and the dummy coded variables. As found in Study 4, there was no evidence of moderation between environmental value ratings and either the self-affirmation or linking affirmation conditions for all models (*p*s > .211). There were no marginal interactions. Since no interactions were significant and the null results largely replicate Study 4, no plots are provided.

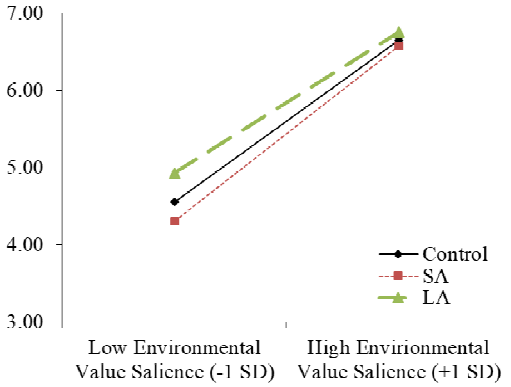
An additional set of models were run to test for moderation of the writing tasks effects by pre-manipulation environmental value salience. No interactions were significant (*p*s > .058). There was one marginal interaction between pre-environmental environmental

salience and the linking affirmation condition compared to the control condition (B = -0.11, SE = 0.06, t = -1.91, p = .058), but this pattern was not predicted.

*Figure 16. Model coefficients and graphs of the interaction between environmental value ratings and value writing tasks. *** $p < .001$.*

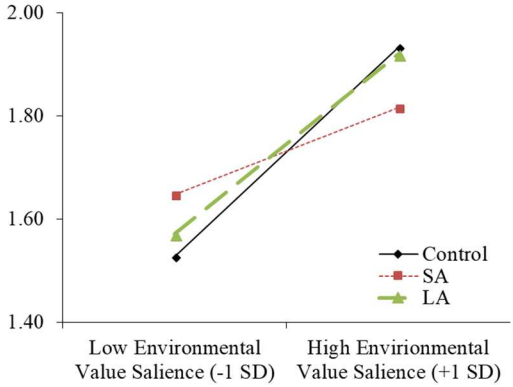
Importance of taking action

	F	R^2	*B* (*SE*)	*p*
	23.86***	.32		
Intercept			5.60 (0.18)	< .001
Environmental value salience			0.62 (0.10)	< .001
Self-affirmation			-0.16 (0.26)	.529
Linking affirmation			0.24 (0.26)	.352
Salience X self-affirmation			0.05 (0.15)	.755
Salience X linking affirmation			-0.08 (0.14)	.609



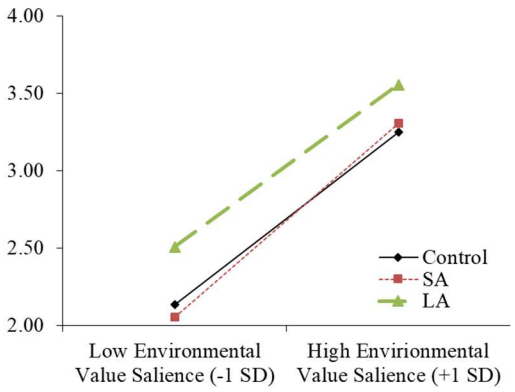
REBIS

	F	R^2	*B* (*SE*)	*p*
	7.49***	.08		
Intercept			1.73 (0.05)	< .001
Environmental value salience			0.12 (0.03)	< .001
Self-affirmation			0.01 (0.07)	.979
Linking affirmation			0.02 (0.07)	.837
Salience X self-affirmation			-0.07 (0.05)	.158
Salience X linking affirmation			-0.02 (0.05)	.729



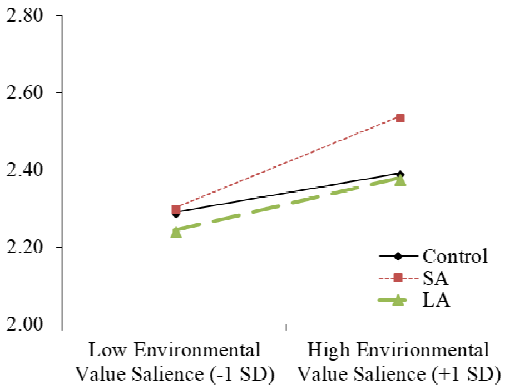
Inclusion of environment in self

	F	R^2	*B* (*SE*)	*p*
	19.61***	.28		
Intercept			2.69 (0.11)	< .001
Environmental value salience			0.33 (0.06)	< .001
Self-affirmation			-0.01 (0.15)	.942
Linking affirmation			0.34 (0.15)	.023
Salience X self-affirmation			0.04 (0.09)	.658
Salience X linking affirmation			-0.02 (0.08)	.797



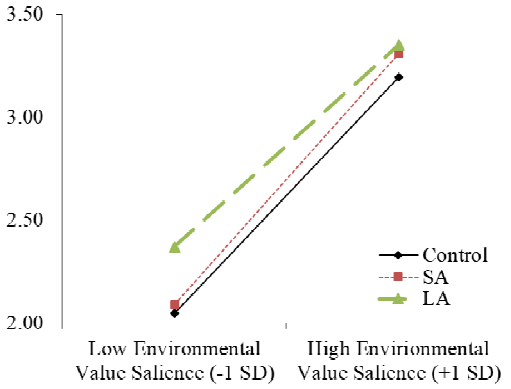
General environmental behavior at follow-up

	F	R^2	*B* (*SE*)	*p*
	7.40***	.15		
Intercept			2.34 (0.05)	< .001
Environmental value salience			0.03 (0.03)	.308
Environmental behavior intentions			0.25 (0.05)	< .001
Self-affirmation			0.08 (0.06)	.185
Linking affirmation			-0.03 (0.06)	.688
Salience X self-affirmation			0.04 (0.04)	.269
Salience X linking affirmation			0.01 (0.04)	.824



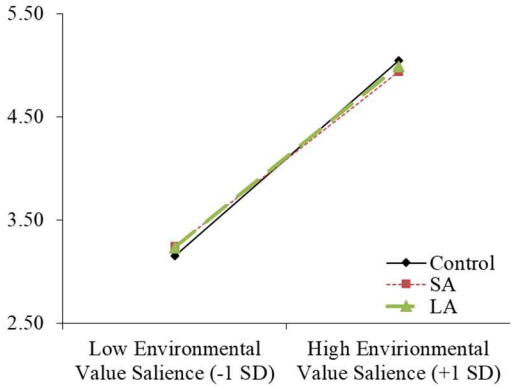
Inclusion of environment in self at follow-up

	F	R^2	*B* (*SE*)	*p*
	19.36***	.28		
Intercept			2.62 (0.10)	< .001
Environmental value salience			0.34 (0.06)	< .001
Self-affirmation			0.08 (0.15)	.585
Linking affirmation			0.24 (0.15)	.100
Salience X self-affirmation			0.02 (0.09)	.752
Salience X linking affirmation			-0.05 (0.08)	.579



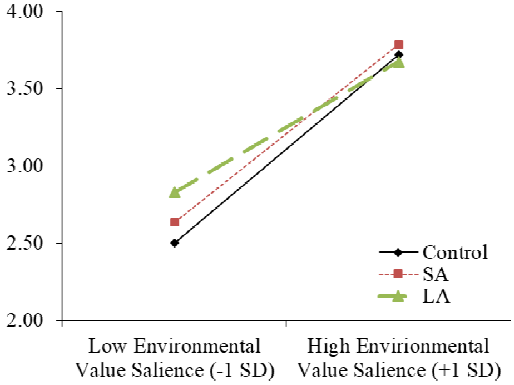
Single-item environmental value salience at follow-up

	F	R^2	*B* (*SE*)	*p*
	29.79***	.37		
Intercept			4.10 (0.13)	< .001
Environmental value salience			0.56 (0.07)	< .001
Self-affirmation			- 0.01 (0.18)	.952
Linking affirmation			0.01 (0.18)	.954
Salience X self-affirmation			-0.06 (0.11)	.580
Salience X linking affirmation			-0.04 (0.10)	.686



Environmental value salience at follow-up

	F	R^2	*B* (*SE*)	*p*
	36.77***	.42		
Intercept			3.11 (0.07)	< .001
Environmental value salience			0.36 (0.04)	< .001
Self-affirmation			0.10 (0.10)	.320
Linking affirmation			0.14 (0.10)	.157
Salience X self-affirmation			-0.02 (0.06)	.685
Salience X linking affirmation			-0.11 (0.06)	.058



I, again, tested for the role in inclusion of environment in self mediating the relationship between linking affirmation and environmental value salience. There was significant mediation such that those in the linking affirmation compared to those in the control and self-affirmation conditions reported that environmental values were closer to their most important values, and that the closer environmental values were to their most important values the more they thought about environmental values one week later, measured with either the single-item or composite environmental salience scales (see Figure 17 and Table 17 for model coefficients). For the single-item salience measure, BC bootstrapping (10,000 samples) found a significant indirect effect (indirect effect = 0.21, bootstrapped *SE* = 0.08, 95% BCCI [0.07, 0.38]). For the salience composite measure, BC bootstrapping (10,000 samples) found a significant indirect effect (indirect effect = 0.13, bootstrapped *SE* = 0.05, 95% BCCI [0.04, 0.19]).[11] Additional mediation models found an indirect effect of the linking affirmation on general environmental behavioral intentions (indirect effect = 0.06, bootstrapped *SE* = 0.02, 95% CI[0.02, 0.11]) and importance of taking action (indirect effect = 0.32, *SE* = 0.12, 95% CI[0.10, 0.57]) through inclusion of environment in self. These results demonstrated that the linking affirmation was effective at increasing environmental value salience when it led to greater inclusion of environment in self and increasing behavioral intentions and attitudes when it led to inclusion of environment in self.

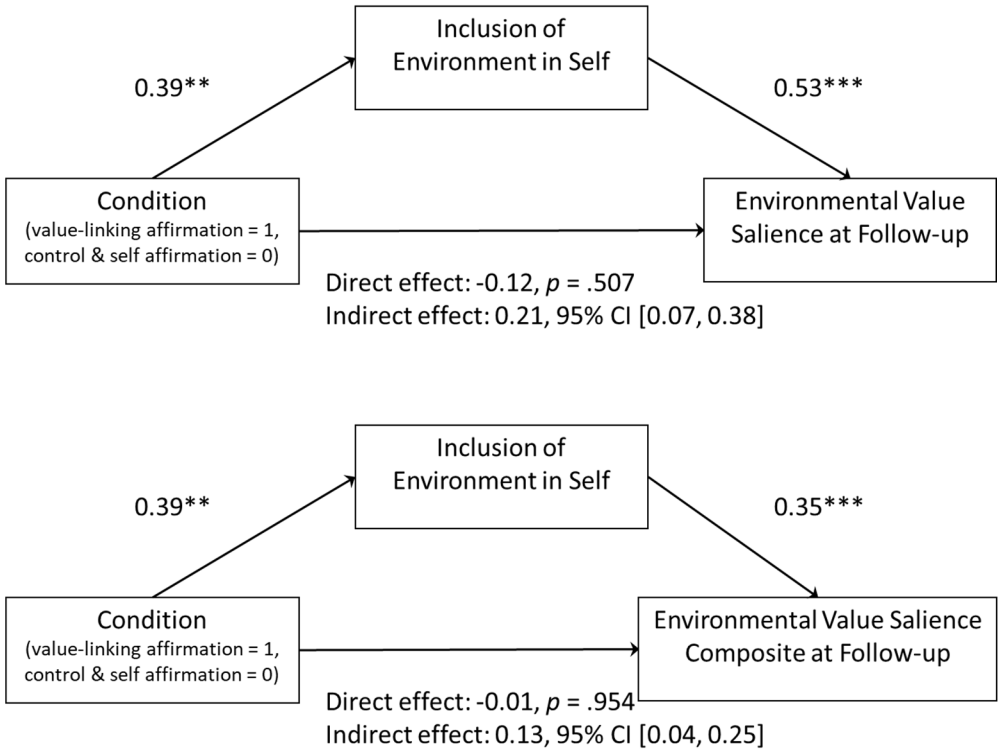
[11] The indirect effects were both still significant if the reference group was just the control condition and self-affirmation is added as an additional covariate.

Table 17. Coefficients for the mediation of the relationship between the linking affirmation and environmental value salience through inclusion of environment in self

	DV: Environmental value salience	DV: Inclusion of environment in self	DV: Environmental value salience
	B (*SE*)	*B* (*SE*)	*B* (*SE*)
Intercept	4.07 (0.11)***	2.67 (0.09)***	2.66 (0.23)***
	*3.14 (0.07)****		*2.21 (0.13)****
Linking affirmation	0.09 (0.19)	0.39 (0.15)**	-0.12 (0.18)
	0.13 (0.11)		*-0.01 (0.10)*
Inclusion of environment in self			0.53 (0.08)***
			*0.35 (0.04)****

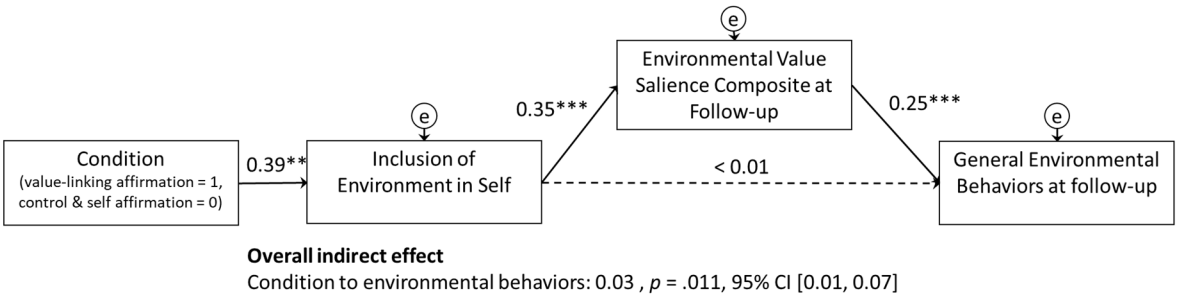
Note. Coefficients for single-item environmental value salience are reported in regular text, and coefficients for the environmental value composite are reported in italics. ** $p < .01$, *** $p < .001$.

Figure 17. Mediation of the relationship between value-linking affirmation and environmental value salience through inclusion of environment in self*. Top image includes the single-item salience measure and the bottom imagine includes the salience composite measure.*



Finally, a path model tested for an overall indirect effect of the linking affirmation writing task compared to the control and affirmation writing tasks on general environmental behaviors at the follow-up through inclusion of environment in self and the salience composite (see Figure 18). Overall, the model showed good fit (CFI = .99, TLI = .98, RMSEA = .05; Hu & Bentler, 1999). Bootstrapping (10,000 samples, bias corrected) revealed a significant overall indirect effect between the linking affirmation and general pro-environmental behaviors (indirect effect: 0.03, p = .011, bootstrapped SE = 0.02, 95% BCCI [0.01, 0.07]).[12] A model without the environmental salience composite mediator reported a significant direct effect between inclusion of environment in self and general environmental behaviors at the follow-up (B = 0.09, SE = 0.02, p < .001).

*Figure 18. Path model demonstrating the indirect relationship between the linking affirmation condition and reported general environmental behaviors one week later. ** p < .01, *** p < .001. Non-significant pathways shown in dashed lines. Unstandardized coefficients are displayed.*



Discussion

Study 5 largely replicated the findings from Study 4. Again, the value-linking affirmation lead to a self-reported increase in inclusion of environment in self. This was the

[12] There is still an overall indirect effect if the single-item salience measure is used.

only main effect of the writing tasks on any of the study outcomes. There were also no significant interactions between either the value-linking or standard self-affirmation writing tasks and environmental value ratings or environmental value salience on any outcomes. Thus, there was no evidence supporting the attenuation predictions or the predictions of additional main effects of the value-linking affirmation.

Mediation and path models did find that the main effect of the value-linking affirmation on inclusion of environment in self had a relationship with self-reported environmental value salience and environmental behaviors one week later. Whether using the single-item salience measure or the composite, inclusion of environment in self significantly mediated the relationship between the value-linking affirmation and environmental value salience. This provided evidence that value-linking affirmation increased environmental value salience and did so by changing individuals' perceptions of how closely their environmental values are to their most important values. Further, the path model shows that the resulting increases in environmental value salience resulting from the value-linking affirmation were related to increased pro-environmental behaviors one week later. Just as with Study 4, there was no main effect of the value-linking affirmation on reported behaviors, supporting the notion that the value-linking affirmation only has an effect on environmental behaviors insofar as it successfully changes how participants view the inclusion of environment in self to their most important value.

Despite the revised instructions in the value-linking affirmation, some participants were still unable to link environmental values to their most important value. At least 11 participants (4% of the sample) explicitly said they could not link the values. For example, when asked to link environmental values to their most important values they said, "It

doesn't, not on my top concerns," "Protecting the environment is not very related to earning money," and "I cannot really related [sic]." There may be two challenges participants face when trying to link their environmental values. First, it may be a difficult task and participants need more than a few suggested examples to help create a meaningful value link despite them attempting to make the link. Second, it may be that for some, they simply do not believe there is any link and do not try to make it. The first challenge may be overcome by continued revisions to the manipulation. The second challenge is more difficult to address, and may require additional manipulation components that help persuade individuals that a making a link is possible.

As previously discussed, self-affirmation theorizing has identified self-threat as a key component in self-affirmation interventions (Sherman & Cohen, 2006). Affirmation leads to behavior change when it can help reduce perceptions of self-threat brought on my things like health articles or other intervention components. By reducing self-threat, it then allows people to change their behaviors based on the information provided by the now less threatening information or materials presented. However, if there is no threat, self-affirmation may not have any effect or may even backfire (Briñol et al., 2007; Jaremka et al., 2011). It may be possible that the climate change article included in Study 5 was not threatening, and thus why there was no effect of the self-affirmation task compared to the control task as either a main effect or in an interaction. The most threatening component of the article was a sentence that stated, "Small changes in the average temperature can translate to large and potentially disastrous shifts in climate and weather." Further, this information was likely not new information to the college student sample. Thus, it may be that this article did not induce any perceived self-threats. Without self-threat, the standard

self-affirmation condition may not have led to any different responses than the control writing condition.

Study 6

I designed Study 6 to test two additional research questions. The first was to test if the effects of the self-affirmation condition would differ between the less-threatening climate change article used in Study 5 and a revised, more-threatening climate change article. The second was to test if the effects of the value-linking affirmation were the result of both the standard affirmation component of the value-linking affirmation and the environmental writing component, or just the environmental writing component. By including an environmental value writing condition without an accompanying affirmation, I could test if simply writing about why environmental values was strong enough to increase inclusion of environment in self. An alternative explanation of the linking affirmation effects could be that this writing task, which individuals likely rarely if ever do on their own and thus may lead to new personal insights about the importance of environmental values, is what is responsible for driving the increase in inclusion of environment in self. Nevertheless, I predicted that the value-linking affirmation would continue to lead to individuals reporting that environmental values were closer to their most important values than those in the standard affirmation or environmental writing only conditions. General environmental behavior intentions were the main outcome of interest.

Design and participants

Study 6 was a 3 (writing task: value-linking affirmation, standard affirmation, environmental writing) X 2 (article type: climate change threat, climate change information) experimental design. Participants (N = 221) were undergraduates participating for course

credit. The survey was administered in a psychology laboratory. The sample was 65.6% (n = 145) female and 34.4% male (n = 76). Ethnicity varied: 37.7% Caucasian (n = 84), 28.3% Asian (n = 63), 27.4% other or multiracial (n = 60), and 6.6% Black (n = 14). Further, 31.2% (n = 69) reported they were Hispanic/Latino(a). Participants were, on average, 18.81 years old (SD = 1.31).

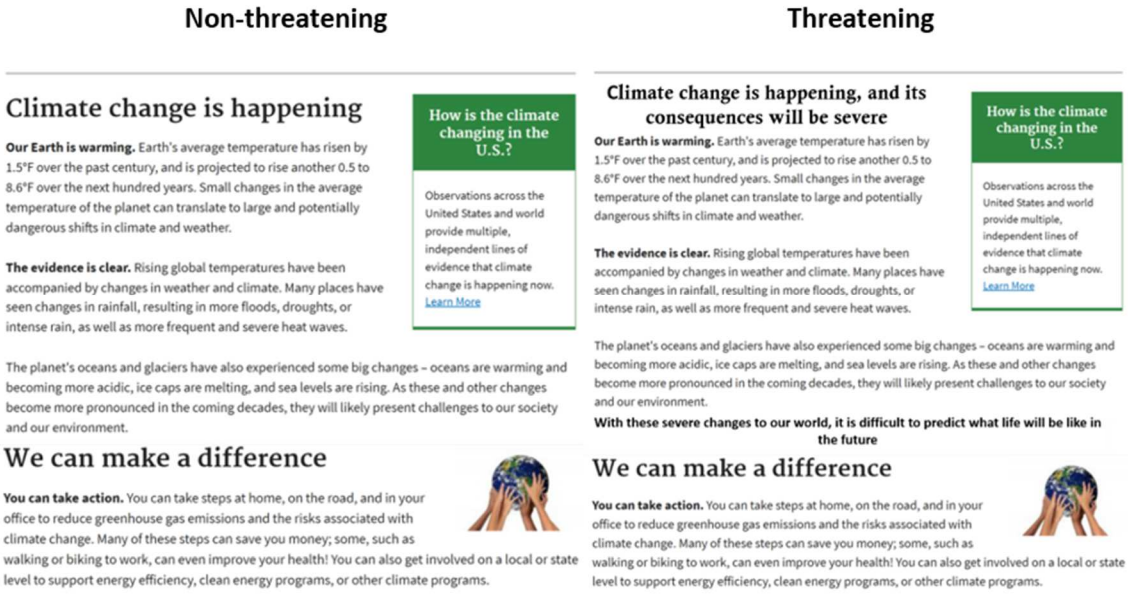
I computed the most conservative effect size for an ANOVA with 6 conditions. I was fully powered individual effects of $f \geq .26$, a medium effect size (Faul et al., 2007). All other analyses were powered to detect at least medium effect sizes.

Procedure and scales

After agreeing to the information sheet, participants completed the same values salience and rating questions as Studies 4 and 5. Next, participants were randomized to either the value-linking affirmation condition, the standard affirmation condition, or an environmental writing only condition. The linking affirmation and standard affirmation condition manipulations were the same as used in Study 5. The environmental writing only condition had participants complete the previously used control writing task and they were asked to think about the environment and write a brief paragraph on why protecting the environment is important. Specifically, the instructions read: "Next we would like you to think about protecting the environment. Why is protecting the environment important? For example, it may be important to protect natural spaces for the wellbeing of wild animals." Next, all participants were randomly assigned to read one of two articles about climate change; one article was designed to be non-threatening and the other threatening. The non-threatening article listed facts and provided suggestions for things individuals can do to do something about climate change. The threatening article contained the same content, but the

title was modified to say, “Climate change is happening, and its consequences will be severe” and an additional sentence was added that said, “With these severe changes to our world, it is difficult to predict what life will be like in the future.” Both articles are presented in Figure 19. Participants then completed the REBIS (α = .89), the climate change importance measure used in Study 5 (α = .93), and inclusion of environment in self question that was used in Studies 4 and 5. They also completed a demographics questionnaire.

Figure 19. Non-threatening and threatening articles from Study 6. The articles have different titles and the threatening article as the additional sentence in bold added near the middle of the article.



Results

First, descriptive statistics and correlations were calculated for the variables of interest, see Table 18 and Table 19. All variables were significantly correlated with each other (*p*s < .001).

Table 18. Means and standard deviations for Study 6

	M (*SD*)
Environmental value rating	5.00 (1.54)
Environmental value salience	4.01 (1.67)
Importance of taking action	5.39 (1.93)
REBIS	1.64 (0.50)
Inclusion of environment in self	2.69 (1.16)

Table 19. Correlations for Study 6

	1.	2.	3.	4.
1. Environmental value rating	—			
2. Environmental value salience	.66***	—		
3. Importance of taking action	.56***	.47***	—	
4. REBIS	.37***	.35***	.39***	—
5. Inclusion of environment in self	.33***	.30***	.36***	.27***

Note. *** $p < .001$.

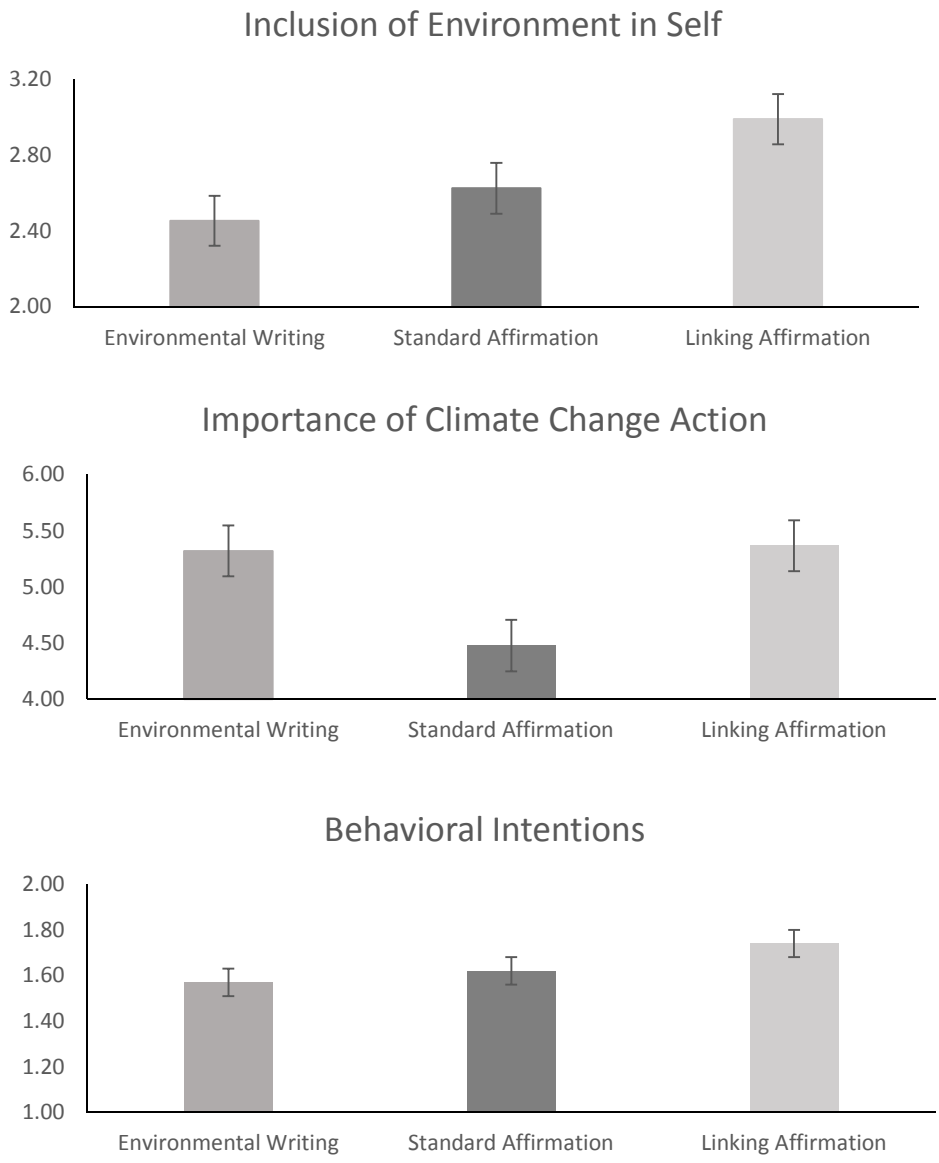
Next, a series of 3 (value writing) X 2 (article type) ANOVAs tested for the effect of both writing task and article type on perceived inclusion of environment in self to most important values, importance of acting to do something about climate change, and behavioral intentions. There were no significant interaction effects of value writing task and article type on the three outcomes, see Table 20 for model tests. There was a significant main effect of value writing condition on perceived inclusion of environment in self ($F(2, 216) = 4.31$, $p = .015$). Pairwise comparisons of marginal means of the value writing conditions using a Tukey HSD adjustment for multiple comparisons found that those in the linking affirmation condition reported environmental values were closer to their most important value ($M = 2.99$, $SD = 1.98$) than those in the environmental writing conditions ($M = 2.45$, $SD = 1.97$, $p = .014$), but were not significantly different from those in the standard affirmation condition ($M = 2.62$, $SD = 2.00$, $p = .145$).

Table 20. Effects of value writing task and article type on inclusion of environment in self, importance of action, and intentions

	Inclusion of environment in self		Importance of climate change action		REBIS	
	F	*p*	*F*	*p*	*F*	*p*
Intercept	1223.41	< .001	1685.70	< .001	2434.62	< .001
Value writing task	4.31	.015	0.11	.895	2.45	.089
Article type	0.92	.338	.15	.696	0.65	.420
Value writing task X article type	0.21	.814	0.98	.379	0.63	.533

To further investigate the effects of the values writing tasks, a series of ANCOVAs were run where article type was treated as a covariate. ANCOVAs were selected since the interaction between writing tasks and article type was not significant, and thus removing the interaction term allowed for a more accurate test of the effects of the writing tasks while still controlling for the article conditions. All marginal means for writing tasks are presented in Figure 19. Values writing task remained a significant predictor of inclusion of environment in self ($F(2, 218) = 4.29$, $p = .015$) and article type was not significant ($F(1, 218) = 0.92$, $p = .339$). Tukey HSD post-hoc tests found that the main effect of value writing task was driven by the difference between environmental writing and the linking affirmation, where the those completing the linking affirmation had significantly greater perceived closeness between environmental values and their most important value ($p = .013$). For importance of climate change action, neither writing task ($F(2, 218) = 0.14$, $p = .874$) or article type were significant ($F(2, 218) = 0.16$, $p = .689$). Similarly, for behavioral intentions, neither writing task ($F(2, 218) = 2.39$, $p = .094$) or article type were significant ($F(1, 218) = 0.65$, $p = .421$).

Figure 19. Estimated marginal means of inclusion of environment in self, importance of action, and behavioral intentions controlling for article type. Error bars represent ±1 standard error.



As in Studies 4 and 5, a series of multiple linear regressions tested for moderation of writing task effects by environmental value ratings. All models included environmental values (mean centered), and two dummy variables representing the three study conditions

(self-affirmation: self-affirmation = 1, environmental writing = 0; linking affirmation: linking affirmation = 1, environmental writing = 0), and the interaction between environmental values and the dummy coded variables. There was no evidence of moderation between environmental value ratings and either the self-affirmation or linking affirmation conditions for all models (*p*s > .515). There were no marginal interactions. As with Study 5, an additional set of models were run to test for moderation of the writing tasks effects by pre-manipulation environmental value salience. No interactions were significant (*p*s > .182). Since no interactions were significant and the null results replicated Studies 4 and 5, no plots are provided.

I tested for the role in inclusion of environment in self mediating the relationship between linking affirmation and REBIS controlling for article type. There was significant mediation such that those in the linking affirmation compared to those in the environmental writing only and self-affirmation condition reported that environmental values were closer to their core values, and that the closer environmental values were to their core values the more environmental behaviors they intended to do (see Figure 20 and Table 21 for model coefficients). There was a significant indirect effect (BC bootstrapping 10,000 samples, indirect effect = 0.05, bootstrapped *SE* = 0.02, 95% BCCI [0.02, 0.11]).[13] These results demonstrated that the linking affirmation was effective at increasing environmental behavior intentions when it led to greater inclusion of environment in self[14].

[13] The indirect effects were both still significant if the reference group was just the environmental writing and self-affirmation versus environmental writing is added as an additional covariate.

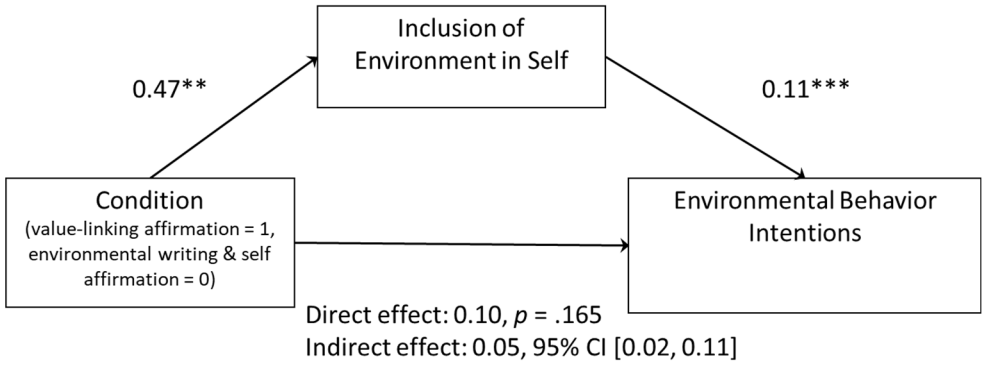
[14] Salience was not measured since salience requires time to pass for an individual to reflect on any potential changes in how frequently they think about environmental values. Individuals likely do not have the introspective ability immediately after the manipulation to know if they will or will not think about environmental values more frequently.

Table 21. Coefficients for the mediation of the relationship between the linking affirmation and environmental value salience through inclusion of environment in self

	DV: REBIS	DV: Inclusion of environment in self	DV: REBIS
	B (*SE*)	*B* (*SE*)	*B* (*SE*)
Intercept	1.62 (0.05)	2.43 (0.12)***	1.35 (0.09)***
Article type	-0.05 (0.07)	0.18 (0.15)	-0.07 (0.07)
Linking affirmation	0.15 (0.07)*	0.47 (0.16)**	0.10 (0.07)
Inclusion of environment in self			0.11 (0.03)***

Note. Linking affirmation: 1 = value-linking affirmation condition, 0 = self-affirmation and environmental writing condition. ** $p < .01$, *** $p < .001$.

Figure 20. Mediation of the relationship between value-linking affirmation and environmental behavior intentions through inclusion of environment in self. Model controlled for article type (1 = threatening, 0 = non-threatening).



Discussion

The value-linking affirmation once again had a main effect of increasing inclusion of environment in self compared to the standard affirmation and environmental writing conditions. Importantly, the value-linking affirmation was significantly different from the environmental value writing condition suggesting that it is indeed the combination of the standard affirmation component *and* the environmental writing component of the value-linking affirmation that led to the increase in inclusion of environment in self. The mediation

model found that the value-linking affirmation was related to greater environmental behavior intentions through increased environmental value salience. There were no other main effects or evidence of any interactions by the writing conditions, and there was no effect of the different article types.

One potential concern regarding the linking-affirmation is that it is a "same-domain" type affirmation. Prior self-affirmation research has found that when individuals affirm on a value that is in the same domain as a forthcoming threat, then the affirmation will not be effective (Blanton, Cooper, Skurnik, & Aronson, 1997; Sivanathan, Molden, Galinsky, & Ku, 2008). For example, writing how important health is to you, and then reading about a relevant health risk may result in increased defensiveness and disengagement with the health message as the affirmation in the threatened domain focuses individuals on defending that important domain. Given that the linking affirmation includes a component that links threat relevant values to most important values, it is important to consider whether or not the linking affirmation could be a same-domain affirmation. Importantly, the linking affirmation first asks participants to complete the standard affirmation with values not related to the forthcoming environmental threat. In this way, the standard affirmation can begin the processes to reduce defensiveness before the environmental domain is introduced in the linking affirmation writing component. Other modified affirmation manipulation procedures have included activities that could potentially be viewed as in the same domain of the threat but still showed the predicted affirmation effects. For example, one study on smoking cessation modified the standard value affirmation to have participants relate their most important value to an individual who supported their goal of quitting smoking (Fotuhi, 2013). Although this affirmation included a component directly related to the threat, the

manipulation was effective at reducing smoking, likely because the threat-relevant component was paired with writing about non-threat related values. It may be that as long as the self-affirmation processes of higher construal and decoupling of threat are initiated by some component of the manipulation, that this is enough to prevent potential backfire effects from "same-domain" affirmations.

Additionally, two important components of the success of modified affirmation manipulations may be the timing of the affirmation and the perceived choice to affirm. Prior work has shown that affirmations are effective if they are introduced before the *initiation* of defensive responses, not only if they are introduced before the presentation of threat (Critcher, Dunning, & Armor, 2010). Even if threat is introduced before or during an affirmation, the affirmation may still be effective to the extent that an individual does not have the opportunity to exhibit any defensive responses. In the case of the linking affirmation, participants would likely not have the opportunity to be defensive unless they write off-prompt, defensive responses in their essays. The second component is perceptions of choice. The more aware participants are of the goal of a self-affirmation (i.e., that an affirmation is supposed to reduce their defensiveness and, for example, boost self-esteem) the less effective it will be (Sherman et al., 2009). The purpose of the linking affirmation may be apparent to some participants as it is rather explicit in what it is doing—linking most important values to environmental values. However, this negative effect of awareness can be counteracted if participants believe they are freely choosing to engage in the affirmation (Silverman, Logel, & Cohen, 2013). The linking affirmation was designed with this in mind, where participants have freedom to select their own most important value and to decide how they feel it is related to their most important value, as opposed to a manipulation that forces a

more scripted written response. Modified affirmation manipulations such as the value-linking affirmation may have potential for strengthening affirmation's effect, but they need to be carefully designed and consider the domain of the affirmation and threat, timing of the affirmation, and perceptions of freely choosing to affirm.

Study 6 provides two important insights. First, the value-linking affirmation has distinct effects from simply writing about environmental values. This supports the idea that it is the linking of environmental values to important values that drives the observed changes in inclusion of environment in self and environmental value salience observed in Studies 4-6. Second, the lack of effect of article type suggests that either climate change threat (or its operationalization in the threatening article) were not personally threatening, or that there are other reasons self-affirmation does not have a main effects or interaction effects in regard to climate change outcomes. Although the article was revised to be more threatening, the revisions were modest, and the article is still very general, talking about change at the global level, and does not directly discuss how it might affect students' lives. The nature of the self-threat in the context of climate change may also be distinct from self-threat in the educational or health domains, where self-affirmation is often shown to have an effect. This is a point addressed in Chapter 5.

Chapter 5: General Discussion

Studies 1-3 tested different how different elements of environmental values related to general and role-specific pro-environmental behaviors. Although the main prediction that role-specific value rankings would have the strongest relationship with role-specific behaviors was not supported, I did find consistent evidence that environmental value salience (representing inclusion of environmental values in the self) had a strong relationship with general pro-environmental behaviors. This insight was used to design a new value-linking affirmation manipulation that I tested in Studies 4-6. The exact predicted patterns of an overall main effect of the linking affirmation on all outcomes and an attenuation effect from the traditional self-affirmation condition were not fully supported. The linking affirmation did, however, successfully increase individuals' perceptions that environmental values were closer to their most important value, leading to greater environmental value salience, environmental behavior intentions, and greater self-reported environmental behaviors one week after completing the manipulation. Further, Rasch modeling provided a psychometric analysis of the REBIS scale used in Studies 5 and 6, finding that the scale and its associated items measured environmental behavior intentions well but that the scale did have important limitations. The findings from this dissertation provide new insights on how values are associated with behaviors and how this knowledge can be leveraged in a novel value-linking affirmation manipulation to change behaviors, informing both values theory and self-affirmation theory.

Insights on the Value-Behavior Relationship

Studies 1-3 were the first studies to examine how value ratings (the most common measurement of values), value rankings, and value salience related to behaviors. These tests

provided a more thorough examination of the value-behavior relationship that is informed by the conceptual understanding of values. Importantly, the three studies consistently found that behaviors were most strongly associated with value salience, and not value ratings or rankings. Value ratings were still often significantly associated with behaviors but did not have stronger relationships with behaviors than value salience. It is important to recognize that these three value elements are all highly related, and the distinction between them may not always be useful. For example, if one is simply trying to maximize predictive power of values, treating these three different elements as an overall latent construct of general value importance may be more useful than distinguishing each element. However, the second goal of my dissertation was to use the insights gained from looking at the three value elements to design a new behavior change manipulation. For my purposes, the specificity of the value elements was most useful as it provided more clear directions for the later manipulation. The value salience findings motivated my approach to modify the standard affirmation manipulation to find a way to create greater inclusion of the environment in the self-concept. If I had found that value rankings were more strongly associated with behaviors, I may have pursued a different manipulation that was modeled after Rokeach's (1973) value ranking manipulation. Thus, the findings from Studies 1-3 provided an important insight about values and informed the later experimental studies.

Value rankings, whether role-specific or general, were not consistently related to either role-specific or general behaviors as predicted. There may be two explanations for this. First, it maybe that value rankings do not have as strong of relationships with behaviors when compared to value salience, and to a lesser extent, value ratings. If this is true, it suggests that the most important dimension of values when trying to predict relevant

behaviors is how much one thinks about a given value. As prior research supports, values are arranged relative to each other in a hierarchical fashion and individuals do differ on the extent to how much they rate each value as important to them (Bardi & Schwartz, 2003; Schwartz, 1992, 2012), but that does not necessarily mean that the ranking dimension of values should be the best predictor of behavior. Further, research has indicated that individuals often have trouble introspecting on cognitive processes (Nisbett & Wilson, 1977). It may be that individuals do not have access to their own cognitive value hierarchy. As such, their explicit responses may not correspond strongly with behavioral outcomes. Value salience, on the other hand, may be a more effective way of measuring the influence of values on behaviors given that the more important a value is to someone personally, the more frequently they may think about that value. Thus, greater value salience, above and beyond rankings and ratings, is most strongly associated with relevant behaviors.

A second and related explanation for the failure of value rankings to show strong relationships with behaviors is that the measurement of value rankings in these studies did not actually measure value rankings well. A rank-ordered list may work well as a heuristic to explain relative value importance, but that alone provides no support that values are arranged, cognitively, the same way. It is possible that values do have a hierarchical structure as proposed by value theories, but this structure may have larger bins of value importance. For example, there may be individuals' top value, followed by two or three second most important values that are all relatively equal in ranking, followed by all other values. Or, individuals may only have a clear ranking for three of their most important values. Although some of these alternative possibilities were explored in Studies 1-3, there are numerous possibilities of different ranking structures. Much larger participant samples would be

needed for the necessary exploratory analyses to test these alternative hierarchical organizations. The consequence of this measurement challenge is that value rankings appear to be weakly associated with behaviors since the actual latent value ranking construct is not being measured well. It may be that value salience is the best proxy measure available to assess value rankings, with the assumption being that more important values relative to others are thought about more. However, this raises an important concern. I conceptualize value salience as distinct from value rankings, proposing the value salience is a general way to measure how frequently a value is activated and thus likely to influence behavior. An alternative explanation may be, given the measurement challenges of value rankings, that value salience is a proxy measure of value rankings. Individuals may have the introspective ability to report on how much they think about a value more so than replicating their cognitive value hierarchy. The current studies cannot determine the degree to which value rankings are distinct from value salience. Considering the challenges individuals may face reporting their value rankings and the challenges of measuring the rankings, continued research on both these conceptual and measurement issues is needed before fully rejecting my hypothesis that value rankings best predict behavior. One potential direction would be to use an ipsative measurement scale that forces participants to choose between two statements that represent conflicting values. For example, a participant might be forced to choose between a less desirable car with better gas millage or a glamorous sports car with terrible gas millage (contrasting environmental versus hedonic values). This type of approach has been used to successfully measure the relative importance of values in personality (i.e., theoretical, economic, esthetic, social, political, and religious values; Allport, Vernon, &

Lindzey, 1960; Vernon & Allport, 1931), and may be a means to measure relative value rankings without using a rank-ordered list.

Role-Specific versus General Behaviors

Across Studies 1-3, there was no apparent advantage to predicting role-specific versus general pro-environmental behaviors. The main prediction that role-specific rankings would have the strongest association with role-specific behaviors was not supported, and none of the other value elements consistently predicted role-specific behaviors better than general behaviors. As mentioned in the discussions of Studies 1-3, it may be that individuals' behavior reports for their most important role largely directs their general behavior reports. It is likely that individuals' most important roles in life are also frequent and prominent roles, so it makes intuitive sense that their general behaviors would be highly correlated with their role-specific behaviors as I found across the first three studies. There may be more utility in predicting role-specific behaviors when an individual's role-specific behavior more strongly deviates from the general behavioral tendencies. For example, individuals often engage in less pro-environmental behavior when traveling (Miao & Wei, 2013). This role (and its associated values and behaviors) may be distinct from an individual's general behaviors, allowing for a stronger relationship between role-specific values and behaviors. Another example may be the role of a new parent, where a parent may be motivated to over-buy and over-consume products for their newborn, wasting more resources than they would in their general life roles. More targeted investigations of these types of roles may reveal the utility in testing role-specific versus general value elements and behaviors, which can then lead to role-specific behavior change approaches.

There are also important measurement challenges to consider. First, role-specific and general behaviors face the same behavioral measurement challenges discussed in Chapter 3, and the constraints of external factors may be even greater for role-specific behaviors than general behaviors. For example, asking how much an individual might recycle in general faces some constraints based on availability of recycling at home, while shopping, at friends' houses, and at work, but the constraining effect is likely weak when averaging across the situations. However, if recycling is not available at work, an individual's role as an employee is considerably constrained. Thus, a much more careful consideration of context is necessary when measuring role-specific behaviors, especially if individuals are allowed to self-select from a variety of general life roles as the variety of roles introduces a high degree of variability in behavioral constraints.

Increasing Value Salience to Change Behavior

Studies 4-6 demonstrated how a linking affirmation could change perceptions of how close environmental values were to individuals' most important values, leading to greater behavior change. These studies provide two important pieces of evidence. The first is that inclusion of environment in self and environmental value salience is malleable. Value theories posit that values (and their relative positions to each other) are fundamental and may be difficult to change (Schwartz, 2012). Although studies have shown value hierarchies can indeed be rearranged, it was only under strong manipulations. In the best example of changing value hierarchies, it was only when college students were induced to feel that their value rankings were similar to anti-civil rights individuals (experiment conducted during the civil rights movement in the 1960s) that they changed their value hierarchies (Rokeach, 1973). In the context of prior theorizing of how fundamental values are and the limited work

showing how malleable they are, it is an important finding to see that the linking affirmation was able to increase inclusion of environment in self and, as a result, environmental value salience. This insight demonstrates that values are a viable intervention target in behavior change efforts. These findings also suggest that value manipulations can change behavior by focusing on increasing inclusion of environment in self and salience, and the manipulations do not necessarily need to rearrange value hierarchies. Indeed, it may be difficult to change value hierarchies, particularly in regard to environmental values which Studies 1-3 found, on average, were ranked low (about the seventh most important value).

The experimental designs in Studies 4-6 provided support for a causal link between environmental value salience, inclusion of environment in the self (as manipulated with the linking affirmation), and behaviors. However, this link is only observed through indirect pathways, meaning that the behavior change is contingent on preceding cognitive changes such as increasing inclusion of environment in self and salience. Although this is considered problematic form the causal steps approach (Baron & Kenny, 1986), this mediation approach is now considered outdated (Hayes, 2009; Shrout & Bolger, 2002) and one of the least powerful tests of mediation (Preacher & Selig, 2012). Contemporary theorizing emphasizes that direct links are not necessary for mediation models (Hayes, 2013; MacKinnon, Lockwood, & Williams, 2004). Nevertheless, in the absence of a direct effect it is important to consider additional unmeasured mediators and overall effect sizes. One possible reason for the lack of a direct effect is that there were additional unmeasured mediators that were in the opposite direction of the measured mediator, cancelling out the direct effect. It may be possible that the linking affirmation also invoked some type of defensive reaction or disengagement for those who were not able to make a successful link between their most

important value and environmental values. It may have been frustrating to attempt and fail at the linking task, which may lead to thoughts that the environment is *not* important or related to their most important values, reducing the inclusion of the environment in the self. Future studies will need to include additional contrasting mediators such as disengagement with the task and perceptions of linking impossibility. By including these contrasting mediators, future work can test if the lack of a direct effect is indeed the result of difficulties with the linking task. This would provide insights into the effects of the linking affirmation and emphasize the need to revise the manipulation to reduce failed linking attempts.

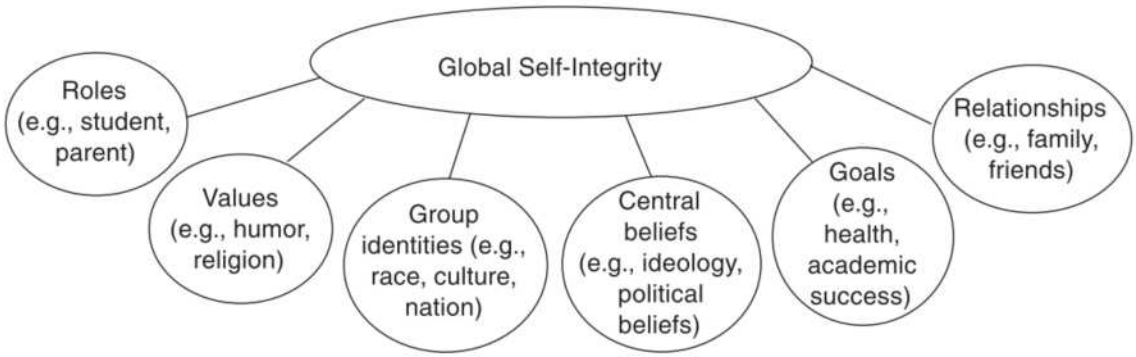
Another important consideration is that the effect size of the linking affirmation was small. The lack of a direct effect may be a result of inadequate statistical power, and it was only with more powerful tests of indirect effects that the mediation was observed. A larger sample would help test for a direct effect, but a more fruitful path would be to continue refining the linking affirmation to reduce the number of participants who fail to make or make only weak links, thereby strengthening the manipulation and its effects on pro-environmental outcomes.

Value-Linking Affirmations and Affirmation Theory

The ability of the value-linking affirmation to increase inclusion of environment in self reveals a new means by which affirmation theory can be used to change behaviors. Self-affirmation theory is often thought of as a means of reducing perceived self-threats, which leads to reduced defensiveness and greater behavior change (Sherman & Cohen, 2006). One of the underlying mechanisms of self-affirmation effects is that affirmations lead to a broader construal of the self, as measured by greater levels of construal (Wakslak & Trope, 2009)

and global self-worth (Critcher & Dunning, 2015b). For example, Figure 21 shows how global self-integrity represents multiple domains of the self-concept.

Figure 21. Representation of global self-integrity and self-concepts (from Sherman & Hartson, 2011).



The linking affirmation leverages this greater construal and self-perspective in a new way to not just reduce self-threat. By including the value-linking task after the affirmation writing component, the linking task takes advantage of the activation of many life domains to help individuals see new connections between them (i.e., connections between their most important values and environmental values). As Study 6 demonstrated, the environmental writing alone was not sufficient to increase inclusion of environment in self. Thus, it is the combination of the traditional affirmation increasing construal and creating a broader self-perspective that then allows individuals to subsequently create new and meaningful links between different value domains. From this perspective, the affirmation serves as a means to create a psychological state that is conducive to revising existing links between more specific values and self-concept domains.

Recognizing this potential new feature of self-affirmation tasks provides important theoretical insights for self-affirmation theory and insights for continued self-affirmation

intervention work. Although self-affirmation mechanisms have been proposed and supported theoretically, there is less empirical support given the complexity of measuring the proposed mechanisms (Cohen & Sherman, 2014; Sherman & Cohen, 2006). The linking affirmation provides some support for the proposal that affirmation leads to greater construal levels and a broader perspective on the self (Critcher & Dunning, 2015b; Sherman & Hartson, 2011; Wakslak & Trope, 2009), given that these effects appear to be necessary for an environmental writing task to create changes in inclusion of environment in self.

The ability of affirmation to create a psychological state more conducive to creating new links between self-concept domains is also relevant for self-affirmation intervention work. Work in the self-affirmation domain has recognized the potential for the integration of self-affirmation with other intervention approaches to create multipronged interventions that are more effective at addressing complex behavior challenges (Cohen & Sherman, 2014; Ehret, LaBrie, Santerre, & Sherman, 2015; Ehret & Sherman, 2014). The insights from the linking affirmation demonstrate that self-affirmation manipulations need not only be a means to reduce self-threat, but they can also be used to create a psychological state that is more apt to make new connections between different domains of the self. Consider an intervention for reducing college student drinking. Self-affirmation may pair well with other behavior intervention components as it reduces defensiveness of college students to hearing information encouraging them to drink less (e.g., Ehret & Sherman, 2017). However, a linking affirmation that asks students to link healthful behaviors with their most important value may not only reduce their defensiveness, but also allow students to reconsider how engaging in more healthful behaviors is personally important given its link to their most

important values. This may further increase the utility of the affirmation approach in addressing challenging behavior change contexts.

Insights Beyond the Environmental Domain

The findings of this dissertation are also relevant outside of the environmental domain. The observed relationships between value ratings, rankings, and salience likely generalize to non-environmental behaviors. Although empirical tests are needed, there are no theoretical reasons to suspect that value salience would not also be a strong predictor of other value relevant behaviors. For example, how much one thinks about their value of power will likely relate to how much they pursue wealth, status, and recognition. How much one thinks about benevolence will likely be associated with more pro-social behaviors. Importantly, the value-behavior relationship tested here largely considers broad classes of behaviors. The relationship between value salience and more specific behaviors may be weaker, and specific attitudes may be more appropriate to consider when trying to understand these specific behaviors.

It is also reasonable to predict that the linking affirmation would be able to increase the inclusion of other values in the self; there is nothing unique about environmental values' ability to increase in inclusion in the self compared to other types of values. However, it will be important to consider the target value and how important that value is in general to the population. I found in my samples that environmental values were, on average, ranked low in importance. Thus, there was room for the value to increase in inclusion in the self. If a target value is ranked low, then there is likely the potential to increase its inclusion in the self. For values that are already important, the linking affirmation may have no effects since values

are already included in the self, and thus the linking affirmation would likely function more as a standard affirmation manipulation.

Limitations

The main finding from Studies 1-3 was that environmental value salience was most strongly and most reliably related with pro-environmental behaviors. However, these studies were all correlational, and no direct causal claims are supported. Further, these studies did not include any direct and competing comparisons between other environmental attitudes scales like the NEP (Dunlap et al., 2000). Thus, there is no evidence that value salience is the best predictor of environmental behaviors. However, comparing effect sizes from Studies 1-3 to average effect sizes from environmental attitude-behavior meta-analyses suggest that environmental value salience has a similar sized relationship (i.e., small-medium) with environmental behaviors, if not slightly larger. Nevertheless, future work should include experimental designs and additional environmental attitude scales. This would also help to provide more evidence of convergent and divergent validity across different environmental attitudes, beliefs, and values scales.

Chapter 3 provided psychometric support for the REBIS, which was used in Studies 5 and 6. However, the Rasch analyses found some areas for revision with the REBIS. Nevertheless, the original REBIS was used in the current analyses. This was in part because the Rasch analyses did not find any issues so severe they would invalidate results from the scale, and also because the psychometric analysis was conducted concurrently with the analyses for Study 5 and Study 6. Any scale revisions would require a recalculation of all results, and potentially lead to type I errors. Thus, given the lack of any severe psychometric issues, I decided to be more conservative and adhere to the original analytic plan without

trying alternative versions REBIS items. Continued work with the REBIS, and other environmental attitudes and behavior scales, should continue to employ psychometric analyses and careful consideration of construct measurement as discussed in Chapter 3.

Regarding the linking affirmation, more participants struggled to complete the manipulation than expected. Conservatively, between 10 to 15% of participants failed the linking manipulation given their explicit written responses that they were unable to make a link between values (e.g., "I do not think the values are related at all."). However, the number that failed was likely higher as some participants appeared to try and make a link, but from reading their response, the link appeared to be weak (e.g., "I don't think they are heavily related, so the only thing I can think of is that in some cases Kpop groups may donate to fundraisers or promote protecting the environment, which may cause more widespread attention and awareness to the issue of climate change."). Those that failed to make a value link likely weakened the overall effect of the linking affirmation manipulation and may potentially explain the absence of main effects on attitudinal and behavioral outcomes. The linking failure may also have produced backfire effects among some participants. Prior work has shown that when affirmed individuals are faced with a very difficult or impossible task it leads to disengagement with the task (Vohs, Park, & Schmeichel, 2013). It may be that some students perceived making a link between two values as impossible. Thus, those who failed the linking task may have exhibited more defensive reactions and were less motivated to change their behaviors. However, I did not measure individuals' perception of difficulty of the linking task or have a clear way of determining if linking responses that appeared weak to an observer were indeed weak for the participant. As a result, I do not have a clear way of testing these potential defensive

reactions in the current data. Continued revisions to the linking manipulation should focus on facilitating the value-linking exercise not only to strengthen the overall effect, but to also prevent potential backfire effects. From inspecting the linking essays, one reason some people may have failed to make successful links is that their selected value was not conducive to linking to environmental values. For example, students selecting values like creativity or humor seemed to have more difficulty linking those values to protecting the environment than students who selected friends and family.

Another limitation in Studies 4-6 is that it appeared that the environmental and climate change articles were not threatening to students. Without a self-threat, self-affirmation may not have an effect or even lead to backfire effects (Briñol et al., 2007; Jaremka et al., 2011; Sherman, Nelson, & Steele, 2000). One challenge with measuring self-threats is that there is not a scale to measure threat directly. Instead, studies often rely on defensive responses such as message derogation, information avoidance, or disengagement with tasks (Sherman & Cohen, 2006), which are assumed to be consequences of perceptions of threat (Gilbert et al., 1998), to support that a self-threat was present. In the affirmation literature, differences between affirmation conditions and control conditions on such outcomes are understood as reductions of threat. Given that there were no differences between the control and self-affirmation conditions in Studies 4-6, there was likely little if any self-threat induced from the articles. Without any self-threat, there is no reason to expect differences between the control and affirmation conditions. An alternative explanation for the null affirmation effects is that the affirmation manipulation failed. However, this seems less likely given that the studies employed the well-used value affirmation manipulation,

which has strong support across many studies (Cohen & Sherman, 2014; McQueen & Klein, 2006).

Although there is support for affirmation reducing defensiveness for both collective and personal threats, continued work with affirmation will benefit from clearly distinguishing between whether a given environmental problem is framed (and perceived) as a personal or collective threat. The environmental domain, and specially climate change, may introduce both collective and personal threats. For example, climate change may pose a personal threat in that there could be consequences for an individual (e.g., increase in experiencing severe weather events) and it may also pose a collective threat (e.g., global sea level rise). Generally, self-affirmation has been studied in regard to personal threats, threats that have direct consequences for the individual (e.g., threats to personal health decisions, Ehret & Sherman, 2017; threats to belonging in the classroom, Sherman et al., 2013). Other work has also applied and found support for the efficacy of affirmation to reduce collective threats (Sherman & Kim, 2005). Nevertheless, it is important to understand the type of threat individuals are facing since there may be different boundary conditions (i.e., moderators) of the affirmation effect depending on the type of threat. Prior work has found that those higher in individualism may be more psychologically vulnerable to threats given that they have less group-based resources to draw from when facing threats (Jetten, Haslam, & Alexander, 2012; Kim, Sherman, & Updegraff, 2016), and self-affirmation was more effective at reducing defensiveness among these individuals (Badea, Binning, Verlhiac, & Sherman, 2018). It may be that those higher in individualism are most vulnerable to personal threats given their lack of group-based resources, and that those higher in collectivism are more vulnerable to collective threats given that collective threats are more relevant to their self-

definitions. Future affirmation research in the environmental domain should explicitly test both collective and personal environmental threats and examine different moderators of the effects the affirmation manipulation.

A final limitation across all studies was the limited generalizability of the samples. Studies 1 and 2 used somewhat diverse online samples while the other four studies used undergraduate psychology students. There are noted limitations of each of these participant pools, particularly that they are not as diverse as a true representative sample of Americans, and they are even less representative of any populations outside of the United States (Arnett, 2008; Henrich et al., 2010). On one hand, value theorists have spent considerable time testing for universality in the structure of values across cultures, generally finding that there is a shared value structure (Schwartz, 1992, 1994). This may suggest that similar results regarding value salience may be found in other cultures given individuals have similar value structures. However, other research has identified that personal attitudes are most strongly predictive of environmental behaviors in American samples, and much less predictive in other cultures where norms, for example, may be more important predictors of environmental behavior (Eom, Kim, Sherman, & Ishii, 2016). Thus, just because value structures maybe shared across cultures does not mean they exert the same influence on behaviors. Another sample related limitation is that there may not be much environmental behavior variability among undergraduates. Undergraduates often engage in high levels of pro-environmental behavior, and thus not only are they somewhat unique from the general population, they may also be less responsive to environmental behavior appeals considering they are already doing many pro-environmental behaviors. More diverse samples and

specific tests of the strength of the value-behavior relationship are needed before these findings can be generalized beyond these limited samples.

Conclusion

Multiple researchers have emphasized that social psychological research has the necessary theories and tools to help address the variety of environmental problems society faces (Clayton et al., 2015; Kaiser, 2014). This dissertation provides an example of how a theoretically informed test of the value-behavior relationship, and a novel value-linking affirmation can contribute to addressing environmental challenges. There is strong theoretical work on the structure of values (Rokeach, 1973; Schwartz, 2012), but more empirical work is needed to fully flesh out the relationship between such value structures, the self (and the multiple aspects of the self), and behaviors. The results from Chapter 2 demonstrate that careful consideration needs to be given to how to best measure values and determine which elements of values are most strongly related to behaviors. Although salience had the strongest and most robust association with behaviors, ratings and rankings often still had relationships with behaviors as well, suggesting that a more comprehensive understanding and measurement of values may be necessary to fully understand the complete role values play in predicting behaviors. Further, by recognizing the importance of values in predicting behavior, it allows for a new perspective with which to view other theories. I applied this perspective to self-affirmation theory to help resolve mixed findings in the literature and create a new value-linking affirmation, but a revived value perspective could also be applied and integrated with other contemporary psychological theories such as moral foundations theory (e.g., how do values and morals intersect?, Haidt & Graham, 2007). This dissertation contributes to continuing theoretical advances in social psychology through a

new perspective on linking values to behaviors and also serves as another example of how social psychology can continue to contribute to understanding and addressing pressing societal issues.

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Appendix A: Role-Specific Value Instrument Pilot Studies

Two pilot studies were run to help develop the role-specific value (RSV) instrument used in Studies 1-3. The main goal of the two pilot studies was to determine if participants were able to complete the activity via an online survey.

Pilot Study 1

Participants. Participants ($N = 211$) were recruited from Amazon's Mechanical Turk. The sample was 49.3% female and 84.8% Caucasian. Participants were, on average, 35.76 years old ($SD = 11.56$) and had a median education level of 4-year college degree. They were paid 90 cents for participation.

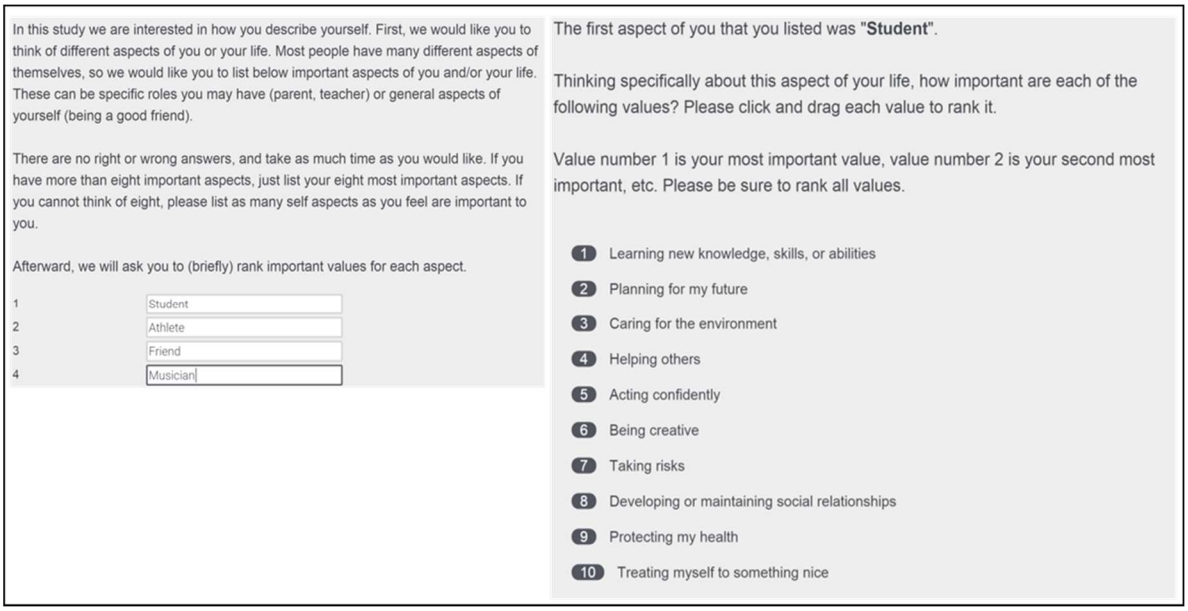
Procedure and scales. The study was an online survey that took about 10 minutes to complete. After agreeing to the information sheet, participants completed the RSV instrument.

RSV instrument. To measure individuals' value rankings in different roles, I asked them to think about different important aspects of "you and/or your life", such as "specific roles you may have (parent, teacher) or general aspects of yourself (being a good friend)." Then I asked participants to report, in open-ended text boxes, up to eight of these self-concepts/roles. Next, I presented participants with a series of up to five ranking tasks that were specific to the top five self-concepts/roles they listed in the first question[15]. For each ranking task, I asked them, "Thinking about this aspect of your life, how important are each of the following values?" The first value in the ranking list was always "caring for the environment" with the idea that participants would have to intentionally rank that value first, as that was my value of interest. There were nine other values (e.g., helping others,

[15] Only up to five self-concepts were ranked given time and attention concerns for the MTurk workers.

protecting my health). Figure A1 shows an example of a completed first and second screen of the instrument. A mean value ranking was calculated from the rank of environmental values across the different self-concepts each participant completed the ranking task for.

Figure A1. First two screens of a completed RSV instrument. Subsequent screens looked the same as the right panel, expect that they listed a different role at the top of the screen.

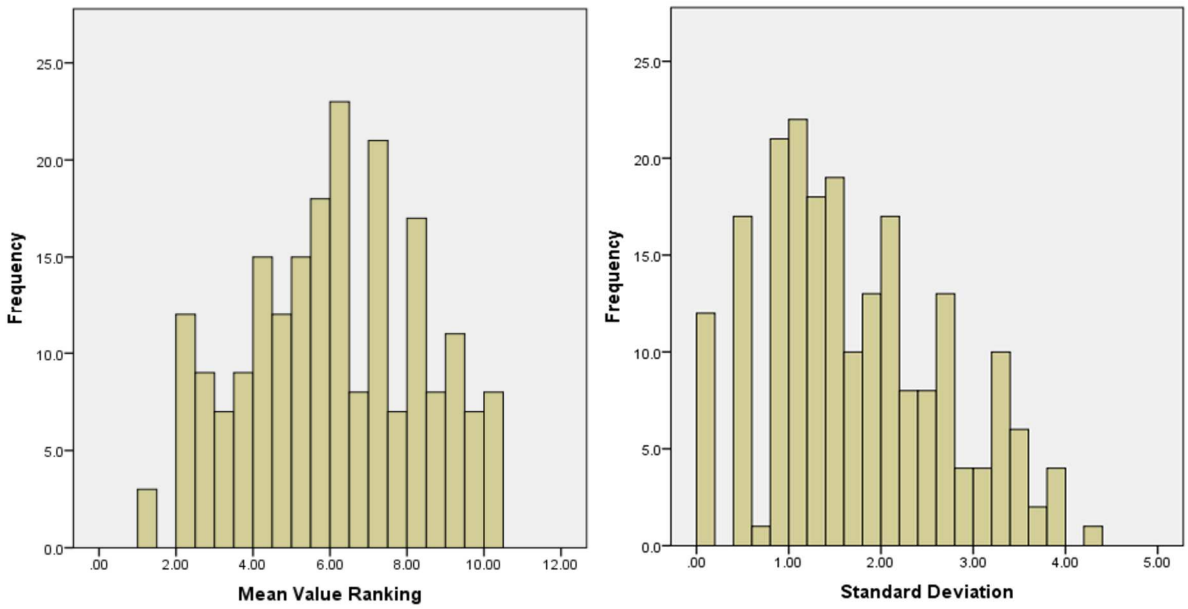


Results.

Mean value rankings. I first calculated the mean value ranking for environmental values across all participants' reported roles (mean value ranking = 6.04, *SD* = 2.25; see Figure A2). This suggests that on average, environmental values have a middling importance among the ten values participants ranked. Next, I calculated each participant's standard deviation for the rank of the environmental values across their different reported roles. The frequencies of participants' standard deviations are presented in Figure A2. Figure A2 suggests that there was a range of variability of participants' ranking of environmental values. If there was little to no variability across self-concepts, I would expect most standard deviations to be less than 1.00. Instead, we see that many participants' standard deviations

are above 1.00, suggesting the rank of environmental values varies across participants' different roles.

Figure A2. Frequencies of participants' mean environmental value rankings and standard deviations of environmental value rankings.



Pilot Study 2

Purpose and Design. This second pilot study was identical to the first pilot study with two exceptions. Participants were undergraduates participating for course credit, and the instructions for the role-specific value hierarchy ranking measure were revised. Just as with the first pilot, the purpose is to have participants complete the RSV instrument. Additionally, I was able to verbally debrief participants and solicit feedback on their experience completing the RSV instrument.

Participants. Participants (N = 159) were undergraduates who received course credit for participation. The sample was 60.6% female and 39.3% Caucasian, 25.2% Asian, 30.3% other or multiracial, and 5.2% Black. Participants were, on average, 18.8 years old.

Procedure and scales. The procedure and scales were identical to the first pilot study with the exception of the RSV instrument, which was revised.

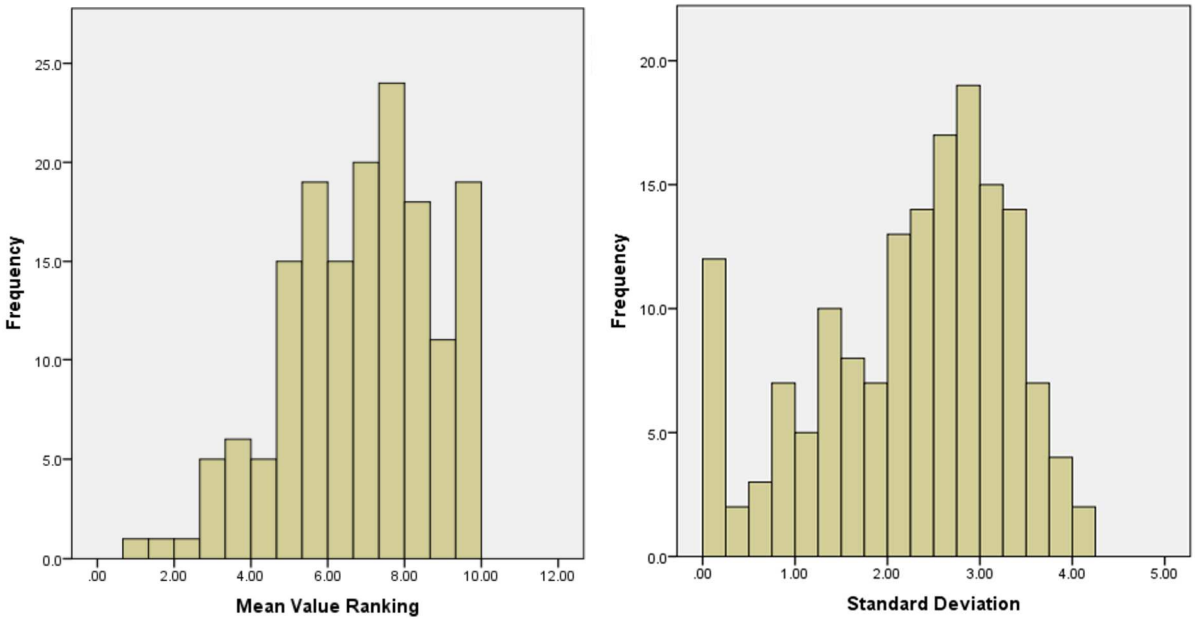
RSV instrument. One issue with the first version of the instrument was that some participants reported self-concepts did not lend themselves well to ranking relevant values, such as listing a value as a self-concept. For this study, I revised the instructions to focus participants on listing important *roles* they have in their life. Further, they were allowed to list up to ten roles, and could rank values for all ten roles since I had fewer concerns about time and participant attention in this sample. The instructions now read (changes denoted with italics):

> "In this study we are interested in how you describe yourself. First, we would like you to think of different *roles you have in your life*. Most people have *many different roles*, so we would like you to list below *important roles you have in your life*. These can be *specific roles you may have (UCSB student) or general roles (being a volunteer*).There are no right or wrong answers, and take as much time as you would like. If you have more than *ten important roles*, just list your ten most important roles. If you cannot think of ten, please list as many roles as you feel are important to you. Afterward, we will ask you to (briefly) rank important values for *each role* you have in your life."

Results.

Mean value ranking. As with the first pilot study, I calculated the mean value ranking for environmental values across all participants' reported roles (mean value ranking = 6.93, *SD* = 1.91; see Figure A3). This suggests that on average, environmental values have a middling importance among the ten values participants ranked. Next, I calculated each participant's standard deviation for the rank of the environmental values across their different reported roles. The frequencies of participants' standard deviations are presented in Figure A3. Once again, the majority of participants show some degree of variability in their ranking of environmental values across their different roles.

Figure A3. Frequencies of participants' mean environmental value rankings and standard deviations of environmental value rankings.



Insights from debriefing. After participants completed the study, they were approached by a research assistant who asked, "Did you have any feedback or reactions about the survey you just completed?" Only 9 of the 159 students had any substantive feedback regarding the RSV instrument. Generally, the feedback indicated that participants felt that they did not have enough roles or the relevant values to accurately represent themselves. However, this was only a minority of participants. Some students mentioned the clicking and dragging of the ranking task on the computer was confusing and difficult. Nevertheless, it seems that the instrument was generally well received and understood.

General Discussion

These two pilot studies provided some evidence that participants were able to complete the RSV activity, and also suggested important revisions that were included on the RSV instrument used in Studies 1-3. One of the more important insights was that allowing participants to self-report their own life domains or roles introduced problems as participants

sometimes selected “domains” or “roles” that were not conducive to the activity. For example, they may have picked values, which made the task of ranking important values for a value non-sensical. As a result, the RSV instrument used in Studies 1 and 2 provided participants a list of roles they could select from instead of allowing them to write in their own roles. The second insight from these pilot data was that there was variability of environmental value rankings across individuals’ different life domains or roles. This justified the use of a role-specific value ranking given that rankings were specific to roles. Thus, in Studies 1-3 I only had participants rank values for one role and rank values in general since the pilot studies suggested that the two ranking sets would likely be different.

Appendix B: Scales from Studies 1-3

Study 1 Scales

For this study, we are interested in your attitudes about a variety of topics. Please take your time reporting your attitudes and beliefs. There are no right or wrong answers. We just want your honest opinions.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O

TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Next, please indicate **how much you think about** each of the following values.

	1 I **never** think about this	2	3	4	5	6	7 I **almost always** think about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving	O	O	O	O	O	O	O

natural resources)							
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Please, **rank** the importance of the following values **as a life-guiding principle for you**.

You can click and drag the values to place them in order.

1 is the most important value as a life-guiding principle.

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Break Before continuing, we would like you to take a quick break.

You can click next in 15 seconds, but feel free to take a longer break (but not too long so the hit expires!).

Below are a list of roles you or may not have in your life.

Please select which role is most important to you, personally.

- O Parent
- O Son/Daughter
- O Consumer
- O Wife/Husband/Partner
- O Girlfriend/Boyfriend
- O Sister/Brother
- O Student
- O Friend
- O Employee
- O American
- O Grandmother/Grandfather
- O Provider/Caretaker
- O Leader
- O Athlete
- O Activist
- O Follower of God

You said your most important role was "${roleselect/ChoiceGroup/SelectedChoices}."

Please write a description of this role in your life. For example, what activities do you do? Where do you do them? Who are you around?

_____

_____

_____

_____

_____

How important to you is your role as a "${roleselect/ChoiceGroup/SelectedChoices}?"

- O Very unimportant
- O Unimportant
- O Important
- O Very important

Now, thinking just about this role in your life, please **RANK** the following values **as a guiding principles** for you in your role as a "${roleselect/ChoiceGroup/SelectedChoices}."

1 is the most important value in your role as a/an "${roleselect/ChoiceGroup/SelectedChoices}."

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Again, thinking just about the role you wrote about, "**${roleselect/ChoiceGroup/SelectedChoices}**," please report how often you do or do not do the following actions **in your role as a/an "${roleselect/ChoiceGroup/SelectedChoices}."**

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the	O	O	O	O	O	O	O

trash instead of in the recycling bin.							
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O
I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O
I keep track of political parties' voting records on environmental issues.	O	O	O	O	O	O	O
I follow current events that impact the environment.	O	O	O	O	O	O	O

Thinking just about **your life in general**, please report how often you do or do not do the following actions.

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the trash instead of in the recycling bin.	O	O	O	O	O	O	O
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O
I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O

I keep track of political parties' voting records on environmental issues.	O	O	O	O	O	O	O
I follow current events that impact the environment.	O	O	O	O	O	O	O

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

- O Male
- O Female

What is your age (in years)?

_____

Are you Hispanic or Latino(a)?

- O Non-Hispanic/Non-Latino
- O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

What is the highest level of education you have completed?

- O Less than High School
- O High School / GED
- O Some College
- O 2-year College Degree
- O 4-year College Degree
- O Masters Degree
- O Doctoral Degree
- O Professional Degree (JD, MD)

What is your annual income range?

- O Below $20,000
- O $20,000 - $39,999
- O $40,000 - $59,999
- O $60,000 - $79,999
- O $80,000 - $99,999
- O $100,000 or more

When it comes to your own wealth, which group would you place yourself in?

- O Richest 20% of Americans
- O Second Richest 20% of Americans
- O Middle 20% of Americans
- O Second Poorest 20% of Americans
- O Poorest 20% of Americans

Is English your first language?

- O Yes
- O No

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) ____

How important is this political party to how you see yourself?

- O Not at All Important
- O 2
- O 3
- O Somewhat Important
- O 5
- O 6
- O Very Important

	Very Liberal	Liberal	Somewhat Liberal	Moderate	Somewhat Conservative	Conservative	Very Conservative
Politically, I consider myself:	O	O	O	O	O	O	O
On economic issues, I consider myself:	O	O	O	O	O	O	O
On social issues, I consider myself:	O	O	O	O	O	O	O

Study 2 Scales

For this study, we are interested in your attitudes about a variety of topics. Please take your time reporting your attitudes and beliefs. There are no right or wrong answers. We just want your honest opinions.

Some questions may look similar, but they are all different. Be sure to read each question carefully.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O

TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Next, please indicate **how much you think about** each of the following values.

	1 I **never** think about this	2	3	4	5	6	7 I **almost always** think about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O

BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Please, **rank** the importance of the following values **as a life-guiding principle for you**.

You can click and drag the values to place them in order.

1 is the most important value as a life-guiding principle.

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Break Before continuing, we would like you to take a quick break.

You can click next in 15 seconds, but feel free to take a longer break (but not too long so the hit expires!).

Below are a list of roles you or may not have in your life.

Please select which of the following roles **is most important to you**, personally.

- O Parent
- O Wife/Husband/Partner
- O Friend
- O Student
- O Family member
- O Provider/Caretaker
- O Follower of God

You said your most important role was "${roleselect/ChoiceGroup/SelectedChoices}."

Please write a description of this role in your life. For example, what activities do you do? Where do you do them? Who are you around?

_____

_____

_____

_____

_____

How important to you is your role as a "${roleselect/ChoiceGroup/SelectedChoices}?"

- O Very unimportant
- O Unimportant
- O Important
- O Very important

Now, thinking just about this role in your life, please **RANK** the following values **as a guiding principles** for you in your role **as a "${roleselect/ChoiceGroup/SelectedChoices}."**

1 is the most important value in your role as a/an "**${roleselect/ChoiceGroup/SelectedChoices}."**

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Again, thinking just about the role you wrote about, "**${roleselect/ChoiceGroup/SelectedChoices}**," please report how often you do or do not do the following actions **in your role as a "${roleselect/ChoiceGroup/SelectedChoices}."**

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the	O	O	O	O	O	O	O

trash instead of in the recycling bin.							
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O
I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O
I keep track of political parties' voting records on environmental issues.	O	O	O	O	O	O	O
I follow current events that impact the environment.	O	O	O	O	O	O	O

Thinking just about **your life in general**, please report how often you do or do not do the following actions.

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the trash instead of in the recycling bin.	O	O	O	O	O	O	O
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O
I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O
I keep track of political	O	O	O	O	O	O	O

parties' voting records on environmental issues.							
I follow current events that impact the environment.	O	O	O	O	O	O	O

Are you more or less likely to do environmentally friendly behaviors in your role as a ${roleselect/ChoiceGroup/SelectedChoices} compared to other roles you have in your life?

O 1 **Much less likely** as a ${roleselect/ChoiceGroup/SelectedChoices} to do environmentally friendly behaviors than in other roles

O 2

O 3

O 4

O 5

O 6

O 7 **Much more likely** as a ${roleselect/ChoiceGroup/SelectedChoices} to do environmentally friendly behaviors than in other roles

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

O Male

O Female

What is your age (in years)?

_____

Are you Hispanic or Latino(a)?

O Non-Hispanic/Non-Latino

O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

What is the highest level of education you have completed?

- O Less than High School
- O High School / GED
- O Some College
- O 2-year College Degree
- O 4-year College Degree
- O Masters Degree
- O Doctoral Degree
- O Professional Degree (JD, MD)

What is your annual income range?

- O Below $20,000
- O $20,000 - $39,999
- O $40,000 - $59,999
- O $60,000 - $79,999
- O $80,000 - $99,999
- O $100,000 or more

When it comes to your own wealth, which group would you place yourself in?

- O Richest 20% of Americans
- O Second Richest 20% of Americans
- O Middle 20% of Americans
- O Second Poorest 20% of Americans
- O Poorest 20% of Americans

Is English your first language?

- O Yes
- O No

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) _____

How important is this political party to how you see yourself?

- O Not at All Important
- O 2
- O 3
- O Somewhat Important
- O 5
- O 6
- O Very Important

	Very Liberal	Liberal	Somewhat Liberal	Moderate	Somewhat Conservative	Conservative	Very Conservative
Politically, I consider myself:	O	O	O	O	O	O	O
On economic issues, I consider myself:	O	O	O	O	O	O	O
On social issues, I consider myself:	O	O	O	O	O	O	O

Study 3 Scales

For this study, we are interested in your attitudes about a variety of topics. Please take your time reporting your attitudes and beliefs. There are no right or wrong answers. We just want your honest opinions.

Some questions may look similar, but they are all different. Be sure to read each question carefully.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O

TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Next, please indicate **how much you think about** each of the following values.

	1 I **never** think about this value	2	3	4	5	6	7 I **almost always** think about this value
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment,	O	O	O	O	O	O	O

caring for nature, saving natural resources)							
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Please, **rank** the importance of the following values **as a life-guiding principle for you.**

You can click and drag the values to place them in order.

1 is the most important value as a life-guiding principle.

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Break Before continuing, we would like you to take a quick break.

You can click next in 15 seconds.

Please take a second and think about your role as a **student** in your life.

Write a description of what being a student means to you. For example, what activities do you do? Where do you do them? Who are you around?

_____

_____

_____

_____

_____

How important is your role as a **student** in your life?

- O Not at all important
- O Somewhat important
- O Important
- O Very important

Now, thinking just about this role in your life, please **RANK** the following values as a guiding principles for you in your role as a **student**.

1 is the most important value in your role as a **student**.

_____ POWER (social power, authority, wealth)
_____ ACHIEVEMENT(success, capability, ambition, influence on people and events)
_____ HEDONISM(gratification of desires, enjoyment in life, self-indulgence)
_____ STIMULATION(daring, a varied and challenging life, an exciting life)
_____ SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)
_____ UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)
_____ PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)
_____ BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)
_____ TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
_____ CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)
_____ SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)

Again, thinking just about the role you wrote about, student, please report how often you do or do not do the following actions **in your role as a student.**

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the trash instead of in the recycling bin.	O	O	O	O	O	O	O
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O
I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O

I keep track of political parties' voting records on environmental issues.	O	O	O	O	O	O	O
I follow current events that impact the environment.	O	O	O	O	O	O	O

Thinking just about **your life in general,** please report how often you do or do not do the following actions.

There are no right or wrong answers.

	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Almost always
I switch products for ecological reasons.	O	O	O	O	O	O	O
I buy products regardless of their polluting effect.	O	O	O	O	O	O	O
I make a special effort to buy recyclable products.	O	O	O	O	O	O	O
I throw glass bottles or cans in the trash instead of in the recycling bin.	O	O	O	O	O	O	O
I pick up litter.	O	O	O	O	O	O	O
I separate paper from my waste.	O	O	O	O	O	O	O

I try to save energy (e.g., turning the lights off when no one is in the room)	O	O	O	O	O	O	O
I try to reuse items before disposing of them.	O	O	O	O	O	O	O
I try to reduce my water use.	O	O	O	O	O	O	O
I keep track of political parties' voting records on environmental issues.	O	O	O	O	O	O	O
I follow current events that impact the environment.	O	O	O	O	O	O	O

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

- O Male
- O Female

What is your age (in years)?

_____

Are you Hispanic or Latino(a)?

- O Non-Hispanic/Non-Latino
- O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

What year in college are you in or entering into?

- O First year
- O Second year
- O Third year
- O Fourth year
- O Fifth year or more

When it comes to your family's wealth, which group would you place yourself in?

- O Richest 20% of Americans
- O Second Richest 20% of Americans
- O Middle 20% of Americans
- O Second Poorest 20% of Americans
- O Poorest 20% of Americans

Is English your first language?

- O Yes
- O No

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) _____

How important is this political party to how you see yourself?

- O Not at All Important
- O 2
- O 3
- O Somewhat Important
- O 5
- O 6
- O Very Important

	Very Liberal	Liberal	Somewhat Liberal	Moderate	Somewhat Conservative	Conservative	Very Conservative
Politically, I consider myself:	O	O	O	O	O	O	O
On economic issues, I consider myself:	O	O	O	O	O	O	O
On social issues, I consider myself:	O	O	O	O	O	O	O

Appendix C: REBIS and REBS Scales

Reoccurring environmental behavior intentions scale (REBIS)

Below are behaviors that you can do that would reduce your greenhouse gas emissions and the risks associated with climate change. Doing more of each of these can reduce your greenhouse gas emissions.

For each behavior, report how likely you are to **increase or decrease** how frequently you do the behavior **in the next week**.

	I will do this **much less** than I usually do	I will do this **less** than I usually do	I will **not change** how much I do this	I will do this **more** than I usually do	I will do this **much more** than I usually do	Not applicable to me
Use reusable shopping bags	O	O	O	O	O	O
Walk, bicycle, carpool, or take public transportation instead of driving a vehicle yourself	O	O	O	O	O	O
Compost food garbage	O	O	O	O	O	O
Abstain from eating meat during a meal	O	O	O	O	O	O
Abstain from consuming dairy products such as milk, cheese, eggs, or yogurt during a meal	O	O	O	O	O	O
Eat organic food	O	O	O	O	O	O
Eat locally produced food (within 100 miles)	O	O	O	O	O	O
Turn off personal electronics or place them in low-power mode when not	O	O	O	O	O	O

in use Conserve water when showering, cleaning clothes, dishes, or during other uses	O	O	O	O	O	O

	I will do this **much less** than I usually do	I will do this **less** than I usually do	I will **not change** how much I do this	I will do this **more** than I usually do	I will do this **much more** than I usually do	Not applicable to me
Abstain from using aerosol products	O	O	O	O	O	O
When in PUBLIC, sort trash into the recycling	O	O	O	O	O	O
When in PRIVATE, sort trash into the recycling	O	O	O	O	O	O
Discuss environmental topics, either in person or with online posts (Facebook, Twitter, etc.)	O	O	O	O	O	O
Purchase environmentally friendly clothing or other products	O	O	O	O	O	O
Use a reusable water bottle	O	O	O	O	O	O
Engage in political activism related to protecting the environment	O	O	O	O	O	O

Reoccurring environmental behavior scale (REBS)

Brick et al., 2017

"Now, please respond to these questions about your behavior. Don't feel any pressure, just indicate what you choose to do." Items are rated 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Often) or 5 (Always).

1. When you visit the grocery store, how often do you use reusable bags?
2. How often do you walk, bicycle, carpool, or take public transportation instead of driving a vehicle by yourself?
3. How often do you drive slower than 60mph on the highway?
4. How often do you go on personal (non-business) air travel?
5. How often do you compost your household food garbage?
6. How often do you eat meat?
7. How often do you eat dairy products such as milk, cheese, eggs, or yogurt?
8. How often do you eat organic food?
9. How often do you eat local food (produced within 100 miles)?
10. How often do you eat from a home vegetable garden (during the growing season)?
11. How often do you turn your personal electronics off or in low-power mode when not in use?
12. When you buy light bulbs, how often do you buy high efficiency compact fluorescent (CFL) or LED bulbs?
13. How often do you act to conserve water, when showering, cleaning clothes, dishes, watering plants, or other uses?
14. How often do you use aerosol products?
15. When you are in PUBLIC, how often do you sort trash into the recycling?
16. When you are in PRIVATE, how often do you sort trash into the recycling?
17. How often do you discuss environmental topics, either in person or with online posts (Facebook, Twitter, etc.)?
18. When you buy clothing, how often is it from environmentally friendly brands?
19. How often do you carry a reusable water bottle?
20. How often do you engage in political action or activism related to protecting the environment?
21. How often do you educate yourself about the environment?

Appendix D: Scales from Studies 4-6

Study 4 Scales

This entire study will take less than 30 minutes of your time. Today you will take a survey that will take about 10 minutes. In 1 week from today we will email you a survey to your umail that will take about 5 minutes. You will receive your .5 credits after completing the second study.

Please tell us your first and last name, and your umail email address. Other emails often sort survey emails to spam/junk folders.

We only collect this information to provide credit and to match your data to previous responses within SONA systems. Your name and email will not be associated with your actual responses.

- O First Name _____
- O Last Name _____
- O Umail email _____

First we will ask you some questions about your life in general.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O

UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Thinking about the following behaviors, please indicate how frequently you do these in a typical week.

	Never	1-3 days a week	4-6 days a week	Once a day	Multiple times a day
Eat red meat (beef)	O	O	O	O	O
Eat any type of meat, poultry, or fish	O	O	O	O	O
Wash clothes	O	O	O	O	O
Watch TV	O	O	O	O	O
Go on the internet	O	O	O	O	O
Exercise	O	O	O	O	O

Self-affirmation manipulation

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious Values
_____ Sense of Humor
_____ Spontaneity/Living life in the moment

Your most important value was "${SA1/ChoiceGroup/ChoiceWithLowestValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your most important value, "${SA1/ChoiceGroup/ChoiceWithLowestValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${SA1/ChoiceGroup/ChoiceWithLowestValue}."

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O

Linking affirmation manipulation

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious Values
_____ Sense of Humor
_____ Spontaneity/Living life in the moment

Your most important value was "${LA1/ChoiceGroup/ChoiceWithLowestValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your most important value, "${LA1/ChoiceGroup/ChoiceWithLowestValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${LA1/ChoiceGroup/ChoiceWithLowestValue}."

	Strongly disagree	Disagree	Somewhat disagree		Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O	O

Next we would like you to think about how protecting the environment is related to your most important value of "${LA1/ChoiceGroup/ChoiceWithLowestValue}." How is protecting the environment relevant to your most important value, or how does protecting the environment help you embody your most important value?

Sometimes this takes a few seconds to think through how these values are related. Try and think about times or role in your life where protecting the environment was important to you and how that may be related to your most important value of "${LA1/ChoiceGroup/ChoiceWithLowestValue}."

Again, write as much or as little as you wish and do not worry about how well it's written.

_____

_____

_____

_____

_____

Control writing task

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious Values
_____ Sense of Humor
_____ Spontaneity/Living life in the moment

Please describe why this personal characteristic (your tenth most important value) or life domain might be important to someone else. Describe a time in someone else's life when it may have been important. Write about this value and don't worry about how well it's written.

Just focus on expressing your thoughts and feelings. Please do your best to write about this event for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your tenth ranked value. List the top two reasons why someone else would pick this as their most important value.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced someone else.	O	O	O	O	O	O
In general, others try to live up to this value.	O	O	O	O	O	O
This value is important to someone else.	O	O	O	O	O	O
Others care about this value.	O	O	O	O	O	O

For the next part of the study we would like you to read an article which we will ask your opinions about.

Article displayed here

Thinking about the article you just read, please indicate how much you disagree or agree with the following statements.

There are no right or wrong answers.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
It is important for me to reduce my red meat consumption.	O	O	O	O	O	O
Eating a red meat-free meal is a meaningful decision.	O	O	O	O	O	O
I care about reducing my red meat consumption.	O	O	O	O	O	O
Eating less red meat is important to me.	O	O	O	O	O	O

Please indicate how much you disagree or agree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
Eating red meat has serious negative impacts on the environment.	O	O	O	O	O	O
The more red meat consumed the worse climate change will be.	O	O	O	O	O	O
The more red meat I eat the more I damage the environment.	O	O	O	O	O	O
Eating less red meat helps protect the environment.	O	O	O	O	O	O

Thinking about the next seven days, please indicate for each day how many meals you eat will have <u>any red meat</u>.

- O Tomorrow _____
- O Two days from now _____
- O Three days from now _____
- O Four days from now _____
- O Five days from now _____
- O Six days from now _____
- O Seven days from now _____

INSTRUCTIONS: Please think the next week. To what extent do you **intend** to do the following behaviors?
Switch products for ecological reasons.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Buy products regardless of their polluting effect.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Make a special effort to buy recyclable products.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Throw glass bottles and cans in the trash instead of in the recycling bin.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Pick litter up off the street.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Separate paper from my waste.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Turn the lights off when no one is in the room.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Reuse plastic bags before disposing of them.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Leave the water on while I brush my teeth.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Reuse a water bottle instead of buying a new one.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Which image below best describes the relationship between your most important value you identified earlier (${SA1/ChoiceGroup/ChoiceWithLowestValue}${LA1/ChoiceGroup/ChoiceWithLowestValue}${Con1/ChoiceGroup/ChoiceWithLowestValue}) and your values toward the environment?

- O (1)
- O (2)
- O (3)
- O (4)
- O (5)

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

- O Male
- O Female

What is your age (in years)?

_____

What year in school are you?

- O Freshman
- O Sophomore
- O Junior
- O Senior or 5th year

Are you Hispanic or Latino(a)?

- O Non-Hispanic/Non-Latino
- O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) _____

How important is this political party to how you see yourself?

- O Not at All Important
- O 2
- O 3
- O Somewhat Important
- O 5
- O 6
- O Very Important 7

Follow-up Survey

This last survey should take no longer than 5 minutes to complete.

All questions are regarding your thoughts and behaviors in the **last 7 days since you participated in the first part of the study**.

Next, please indicate **how much you thought about** each of the following values in the past 7 days.

	1 I **never** thought about this	2	3	4	5	6	7 I **almost always** thought about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in	O	O	O	O	O	O	O

life, devotion, modesty)							
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Please, **rate** the importance of the following values **as a life-guiding principle for you** in the past 7 days.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment,	O	O	O	O	O	O	O

caring for nature, saving natural resources)							
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Thinking about the **past** seven days, please indicate for each day how many meals you ate.

O Yesterday ____

O Two days ago ____

O Three days ago ____

O Four days ago ____

O Five days ago ____

O Six days ago ____

O Seven days ago ____

Thinking about the past seven days, please indicate for each day how many meals you ate that had <u>any type of meat</u> (including red meat, white meat/poultry, and fish).

O Yesterday ____

O Two days ago ____

O Three days ago ____

O Four days ago ____

O Five days ago ____

O Six days ago ____

O Seven days ago (____

Thinking about the next seven days, please indicate for each day how many meals you eat will have any red meat.

- O Yesterday ____
- O Two days ago ____
- O Three days ago ____
- O Four days ago ____
- O Five days ago ____
- O Six days ago ____
- O Seven days ago ____

Which image below best describes the relationship between your most important value you identified in your first survey () and your values toward the environment?

- O (1)
- O (2)
- O (3)
- O (4)
- O (5)

INSTRUCTIONS: Please think the last 7 days. To what extent did you do the following behaviors?

Switched products for ecological reasons.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Bought products regardless of their polluting effect.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Made a special effort to buy recyclable products.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Threw glass bottles and cans in the trash instead of in the recycling bin.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Picked litter up off the street.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Separated paper from my waste.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Turned the lights off when no one was in the room.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Reused plastic bags before disposing of them.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Left the water on while I brushed my teeth.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Reused a water bottle instead of buying a new one.

- O Never
- O Rarely
- O Occasionally
- O Sometimes
- O Frequently
- O Usually
- O Always

Study 5 Scales

Thank you for participating in the study.

This entire study will take less than 30 minutes of your time. Today you will take a survey that will take about 10 minutes. In 1 week from today we will email you a survey to your umail that will take about 5 minutes. You will receive your .5 credits after completing the second survey.

Please tell us your first and last name, and your umail email address. Other emails often sort survey emails to spam/junk folders.

We only collect this information to provide credit and to match your data to previous responses within SONA systems. Your name and email will not be associated with your actual responses.

- O First Name _____
- O Last Name _____
- O Umail email _____

First we will ask you some questions about your life in general.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O

SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Next, please indicate **how much you think about** each of the following values.

	1 I **never** think about this	2	3	4	5	6	7 I **almost always** think about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life,	O	O	O	O	O	O	O

self-indulgence)							
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Self affirmation

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious values
_____ Sense of humor
_____ Spontaneity/Living life in the moment

Your most important value was "${SA1/ChoiceGroup/ChoiceWithLowestValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

gain, think about your most important value, "${SA1/ChoiceGroup/ChoiceWithLowestValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${SA1/ChoiceGroup/ChoiceWithLowestValue}."

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O

Linking affirmation

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious values
_____ Sense of humor
_____ Spontaneity/Living life in the moment

Your most important value was "${LA1/ChoiceGroup/ChoiceWithLowestValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your most important value, "${LA1/ChoiceGroup/ChoiceWithLowestValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${LA1/ChoiceGroup/ChoiceWithLowestValue}."

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O

Next we would like you to think about how protecting the environment is related to your most important value of "${LA1/ChoiceGroup/ChoiceWithLowestValue}." How is protecting the environment relevant to your most important value, or how does protecting the environment help you embody your most important value?

For example, protecting the environment may prevent unhealthy conditions for friends and family. Or, protecting the environment may help you enjoy important activities you enjoy like surfing, hiking, or skiing.

Sometimes this takes a few seconds to think through how these values are related. Try and think about times or role in your life where protecting the environment was important to you and how that may be related to your most important value of "${LA1/ChoiceGroup/ChoiceWithLowestValue}."

Again, write as much or as little as you wish and do not worry about how well it's written.

_____

_____

_____

_____

_____

Control writing task

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious values
_____ Sense of humor
_____ Spontaneity/Living life in the moment

Please describe why this personal characteristic (your tenth most important value) or life domain might be important to someone else. Describe a time in someone else's life when it may have been important. Write about this value and don't worry about how well it's written.

Just focus on expressing your thoughts and feelings. Please do your best to write about this event for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your tenth ranked value. List the top two reasons why someone else would pick this as their most important value.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced someone else.	O	O	O	O	O	O
In general, others try to live up to this value.	O	O	O	O	O	O
This value is important to someone else.	O	O	O	O	O	O
Others care about this	O	O	O	O	O	O

value.

For the next part of the study we would like you to read an article which we will ask your opinions about.

Article inserted here

Below are behaviors that you can do that would reduce your greenhouse gas emissions and the risks associated with climate change. Doing more of each of these can reduce your greenhouse gas emissions.

For each behavior, report how likely you are to **increase or decrease** how frequently you do the behavior **in the next week**.

	I will do this **much less** than I usually do	I will do this **less** than I usually do	I will **not change** how much I do this	I will do this **more** than I usually do	I will do this **much more** than I usually do	Not applicable to me
Use reusable shopping bags	O	O	O	O	O	O
Walk, bicycle, carpool, or take public transportation instead of driving a vehicle yourself	O	O	O	O	O	O
Compost food garbage	O	O	O	O	O	O
Abstain from eating meat during a meal	O	O	O	O	O	O
Abstain from consuming dairy products such as milk, cheese, eggs, or yogurt during a meal	O	O	O	O	O	O
Eat organic food	O	O	O	O	O	O

Eat locally produced food (within 100 miles)	O	O	O	O	O	O
Turn off personal electronics or place them in low-power mode when not in use	O	O	O	O	O	O
Conserve water when showering, cleaning clothes, dishes, or during other uses	O	O	O	O	O	O
Abstain from using aerosol products	O	O	O	O	O	O
When in PUBLIC, sort trash into the recycling	O	O	O	O	O	O
When in PRIVATE, sort trash into the recycling	O	O	O	O	O	O
Discuss environmental topics, either in person or with online posts (Facebook, Twitter, etc.)	O	O	O	O	O	O
Purchase environmentally friendly clothing or other products	O	O	O	O	O	O
Use a reusable water bottle	O	O	O	O	O	O
Engage in political	O	O	O	O	O	O

activism related to protecting the environment	

Please indicate how much you disagree or agree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
Taking action to reduce my greenhouse gas emissions is important	O	O	O	O	O	O
I want to do something about climate change	O	O	O	O	O	O
It is important to me to find new ways to fight climate change	O	O	O	O	O	O

Which image below best describes the relationship between your most important value you identified earlier (${SA1/ChoiceGroup/ChoiceWithLowestValue}${LA1/ChoiceGroup/ChoiceWithLowestValue}${Con1/ChoiceGroup/ChoiceWithLowestValue}) and your values toward the environment?

- O (1)
- O (2)
- O (3)
- O (4)
- O (5)

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

- O Male
- O Female

What is your age (in years)?

_____

What year in school are you?

- O Freshman
- O Sophomore
- O Junior
- O Senior or 5th year

Are you Hispanic or Latino(a)?

- O Non-Hispanic/Non-Latino
- O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

What is your yearly family income?

- O Under $15,000
- O $15,001 - $25,000
- O $25,001 - $35,000
- O $35,001 - $50,000
- O $50,001 - $75,000
- O $75,001 - $100,000

- O $100,001 - $150,000
- O Over $150,000

What is your father's highest level of education?

- O Less than high school graduate
- O High school graduate
- O Some College
- O Associate's Degree
- O Bachelor's Degree
- O Master's Degree or higher
- O Do not know

What is your mother's highest level of education?

- O Less than high school graduate
- O High school graduate
- O Some college
- O Associate's Degree
- O Bachelor's Degree
- O Master's Degree or higher
- O Do not know

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) _____

How important is this political party to how you see yourself?

- O Not at All Important
- O (2)
- O (3)
- O Somewhat Important
- O (5)
- O (6)
- O Very Important

Follow-up survey

Thank you for completing the second part of the study.

This last survey should take no longer than 5 minutes to complete.

All questions are regarding your thoughts and behaviors in the **last 7 days since you participated in the first part of the study**.

For each behavior, report whether you **increased or decreased** how frequently you did the behavior **in the past week**.

	I did this **much less** than I usually do	I did this **less** than I usually do	I did **not change** how much I usually do this	I did this **more** than I usually do	I did this **much more** than I usually do	Not applicable to me
Use reusable shopping bags	O	O	O	O	O	O
Walk, bicycle, carpool, or take public transportation instead of driving a vehicle yourself	O	O	O	O	O	O
Compost food garbage	O	O	O	O	O	O
Abstain from eating meat during a meal	O	O	O	O	O	O
Abstain from consuming dairy products such as milk, cheese, eggs, or yogurt during a meal	O	O	O	O	O	O
Eat organic food	O	O	O	O	O	O
Eat locally produced food (within 100 miles)	O	O	O	O	O	O

Turn off personal electronics or place them in low-power mode when not in use	O	O	O	O	O	O
Conserve water when showering, cleaning clothes, dishes, or during other uses	O	O	O	O	O	O
Abstain from using aerosol products	O	O	O	O	O	O
When in PUBLIC, sort trash into the recycling	O	O	O	O	O	O
When in PRIVATE, sort trash into the recycling	O	O	O	O	O	O
Discuss environmental topics, either in person or with online posts (Facebook, Twitter, etc.)	O	O	O	O	O	O
Purchase environmentally friendly clothing or other products	O	O	O	O	O	O
Use a reusable water bottle	O	O	O	O	O	O
Engage in political activism related to protecting the environment	O	O	O	O	O	O

Please indicate how much you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I find myself thinking about protecting the natural environment on a daily basis	O	O	O	O	O
I am always thinking about ways to protect the planet	O	O	O	O	O
Ways to protect the environment are always on my mind	O	O	O	O	O

Next, please indicate **how much you thought about** each of the following values in the past 7 days.

	1 I **never** thought about this	2	3	4	5	6	7 I **almost always** thought about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O

UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Please, **rate** the importance of the following values **as a life-guiding principle for you** in the past 7 days.

Use the 7 point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O

STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Which image below best describes the relationship between your most important value you identified in your first survey and your values toward the environment?

O (1)

O (2)

O (3)

O (4)

O (5)

Study 6 Scales

First, we will ask you some questions about your life in general.

Please, **rate** the importance of the following values **as a life-guiding principle for you**.

Use the 7-point scale in which 1 indicates the value is not important for you, 4 indicates the value is important, and 7 indicates that the value is of supreme importance for you.

	1 Not important	2	3	4 Important	5	6	7 Of supreme importance
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O
TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O

CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Next, please indicate **how much you think about** each of the following values.

	1 I **never** think about this	2	3	4	5	6	7 I **almost always** think about this
POWER (social power, authority, wealth)	O	O	O	O	O	O	O
ACHIEVEMENT(success, capability, ambition, influence on people and events)	O	O	O	O	O	O	O
HEDONISM(gratification of desires, enjoyment in life, self-indulgence)	O	O	O	O	O	O	O
STIMULATION(daring, a varied and challenging life, an exciting life)	O	O	O	O	O	O	O
SELF-DIRECTION(creativity, freedom, curiosity, independence, choosing one's own goals)	O	O	O	O	O	O	O
UNIVERSALISM(broad-mindedness, beauty of arts, justice, a world at peace, equality, wisdom)	O	O	O	O	O	O	O
PROTECTING THE ENVIRONMENT(looking after the environment, caring for nature, saving natural resources)	O	O	O	O	O	O	O
BENEVOLENCE(helpfulness, honesty, forgiveness, loyalty, responsibility)	O	O	O	O	O	O	O

TRADITION(respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	O	O	O	O	O	O	O
CONFORMITY(obedience, honoring parents and elders, self-discipline, politeness)	O	O	O	O	O	O	O
SECURITY(national security, family security, social order, cleanliness, reciprocation of favors)	O	O	O	O	O	O	O

Linking affirmation

Next, we would like you to take a second and think about your most important personal value.
This could be your friends and family, health, or anything else that is important to you.
Once you have decided on your most important personal value, please write it in the box. It can be one word or multiple words.

_____

Your most important value was "${LA1/ChoiceTextEntryValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your most important value, "${LA1/ChoiceTextEntryValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${LA1/ChoiceTextEntryValue}."

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O

Next we would like you think think about how protecting the environment is related to your most important value of "${LA1/ChoiceTextEntryValue}." How is protecting the environment relevant to your most important value, or how does protecting the environment help you embody your most important value?

For example, protecting the environment may prevent unhealthy conditions for friends and family. Or, protecting the environment may help you enjoy important activities you enjoy like surfing, hiking, or skiing.

Sometimes this takes a few seconds to think through how these values are related. Try and think about times or role in your life where protecting the environment was important to you and how that may be related to your most important value of "${LA1/ChoiceTextEntryValue}."

Again, write as much or as little as you wish and do not worry about how well it's written.

_____

_____

_____

_____

_____

Control writing task

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please read carefully over this list and think about each of these values. Then, rank these values and qualities in order of their importance to you, from 1 to 11 ("1" being the most important item, "11" being the least important). **Use each number only once.**

_____ Artistic skills
_____ Athletics
_____ Business/earning money
_____ Creativity
_____ Independence
_____ Musical ability/appreciation
_____ Politics
_____ Relations with friends or family
_____ Religious values
_____ Sense of humor
_____ Spontaneity/Living life in the moment

Please describe why this personal characteristic (your tenth most important value) or life domain might be important to someone else. Describe a time in someone else's life when it may have been important. Write about this value and don't worry about how well it's written.

Just focus on expressing your thoughts and feelings. Please do your best to write about this event for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your tenth ranked value. List the top two reasons why someone else would pick this as their most important value.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced someone else.	O	O	O	O	O	O
In general, others try to live up to this value.	O	O	O	O	O	O
This value is important to someone else.	O	O	O	O	O	O
Others care about this value.	O	O	O	O	O	O

Environmental writing only task

Next we would like you to think about protecting the environment.

Why is protecting the environment important?

For example, it may be important to protect natural spaces or the well being of wild animals.

Please do your best to write any reasons why protecting the environment is important.

Again, write as much or as little as you wish and do not worry about how well it's written.

_____

_____

_____

_____

_____

Self affirmation

Next, we would like you to take a second and think about your most important personal value.
This could be your friends and family, health, or anything else that is important to you.
Once you have decided on your most important personal value, please write it in the box. It can be one word or multiple words.

_____

Your most important value was "${aff1/ChoiceTextEntryValue}."
Please describe why this personal characteristic or life domain is important and meaningful to you. Think about a time in your life that this was particularly important. Write about this value and don't worry about how well it's written. Just focus on expressing your memory of the event and the feelings that you had at the time. Please do your best to write about this event and your feelings for the next 2-5 minutes.

_____

_____

_____

_____

_____

Again, think about your most important value, "${aff1/ChoiceTextEntryValue}." List the top two reasons why this is important to you.

O 1. _____

O 2. _____

Please indicate how much you agree with each of the following statements about your value, "${aff1/ChoiceTextEntryValue}."

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This value or personal characteristic has influenced my life.	O	O	O	O	O	O
In general, I try to live up to this value.	O	O	O	O	O	O
This value is an important part of who I am.	O	O	O	O	O	O
I care about this value.	O	O	O	O	O	O

For the next part of the study we would like you to read an article which we will ask your opinions about.

Article inserted here

Below are behaviors that you can do that would reduce your greenhouse gas emissions and the risks associated with climate change. Doing more of each of these can reduce your greenhouse gas emissions.

For each behavior, report how likely you are to **increase or decrease** how frequently you do the behavior **in the next week**.

	I will do this **much less** than I usually do	I will do this **less** than I usually do	I will **not change** how much I do this	I will do this **more** than I usually do	I will do this **much more** than I usually do	Not applicable to me
Use reusable shopping bags	O	O	O	O	O	O

Walk, bicycle, carpool, or take public transportation instead of driving a vehicle yourself	O	O	O	O	O	O
Compost food garbage	O	O	O	O	O	O
Abstain from eating meat during a meal	O	O	O	O	O	O
Abstain from consuming dairy products such as milk, cheese, eggs, or yogurt during a meal	O	O	O	O	O	O
Eat organic food	O	O	O	O	O	O
Eat locally produced food (within 100 miles)	O	O	O	O	O	O
Turn off personal electronics or place them in low-power mode when not in use	O	O	O	O	O	O
Conserve water when showering, cleaning clothes, dishes, or during other uses	O	O	O	O	O	O
Abstain from using aerosol products	O	O	O	O	O	O
When in PUBLIC, sort trash into the	O	O	O	O	O	O

recycling						
When in PRIVATE, sort trash into the recycling	O	O	O	O	O	O
Discuss environmental topics, either in person or with online posts (Facebook, Twitter, etc.)	O	O	O	O	O	O
Purchase environmentally friendly clothing or other products	O	O	O	O	O	O
Use a reusable water bottle	O	O	O	O	O	O
Engage in political activism related to protecting the environment	O	O	O	O	O	O

Please indicate how much you disagree or agree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
Taking action to reduce my greenhouse gas emissions is important	O	O	O	O	O	O
I want to do something about climate change	O	O	O	O	O	O
It is important to me to find new ways to	O	O	O	O	O	O

fight climate change

Which image below best describes the relationship between your most important value you identified earlier (${LA1/ChoiceGroup/ChoiceWithLowestValue}${CTRL1/ChoiceGroup/ChoiceWithLowestValue}) and your values toward the environment?

- O (1)
- O (2)
- O (3)
- O (4)
- O (5)

INSTRUCTIONS: Lastly, please answer the following demographic questions.

Sex:

- O Male
- O Female

What is your age (in years)?

_____

What year in school are you?

- O Freshman
- O Sophomore
- O Junior
- O Senior or 5th year

Are you Hispanic or Latino(a)?

- O Non-Hispanic/Non-Latino
- O Hispanic/Latino(a)

Please indicate which of the following best describes you:

- O American Indian/Alaskan Native
- O Asian
- O Native Hawaiian/Pacific Islander
- O African American/Black
- O Caucasian/White
- O Multiracial (please specify): _____
- O Other (please specify): _____

What is your yearly family income?

- O Under $15,000
- O $15,001 - $25,000
- O $25,001 - $35,000
- O $35,001 - $50,000
- O $50,001 - $75,000
- O $75,001 - $100,000
- O $100,001 - $150,000
- O Over $150,000

What is your father's highest level of education?

- O Less than high school graduate
- O High school graduate
- O Some College
- O Associate's Degree
- O
- O Bachelor's Degree
- O Master's Degree or higher
- O Do not know

What is your mother's highest level of education?

- O Less than high school graduate
- O High school graduate
- O Some college
- O Associate's Degree
- O
- O Bachelor's Degree
- O Master's Degree or higher
- O Do not know

Which political party do you identify with?

- O Republican
- O Democrat
- O Independent
- O Tea Party
- O Green
- O Other (Please Specify) _____

How important is this political party to how you see yourself?

- O 1 Not at All Important
- O 2
- O 3
- O 4 Somewhat Important
- O 5
- O 6
- O 7 Very Important