

RANDOMIZED CONTROLLED TRIAL OF INTERVENTIONS  
TO PROMOTE INTELLECTUAL HUMILITY

BY

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**LIST OF ABBREVIATIONS**

IH—Intellectual Humility

PTG – Posttraumatic Growth

ANOVA – Analysis of variance

MANOVA – Multivariate analysis of variance

## **ABSTRACT**

Although initial research has found evidence for the importance and benefits of intellectual humility (IH), limited work has been done on developing and evaluating interventions aimed at increasing IH. The present research aimed to develop and evaluate interventions to promote IH among a student sample. Participants were placed in one of four conditions; factual writing, prospective writing, self-distancing, and a control condition. The effectiveness of each condition on each of four dependent variables – intellectual humility, tolerance, wisdom and well-being - was assessed. However, no significant differences existed between groups on the dependent variables. Limitations and future research directions are addressed.

## INTRODUCTION

Researchers in both psychology and philosophy have recently begun exploring the concept of intellectual humility (IH) as a key component of wisdom (Grossmann, Gerlach, & Denissen, 2016; see also Krumrei-Mancuso & Rouse, 2016; Leary et al., 2017). One prominent approach to wisdom conceptualizes it in terms of unbiased thought (Brienza, Kung, Santos, Bobocel, & Grossmann, 2017), and IH has been posited by researchers to be an integral component to an individual's ability to enact wisdom and wisdom-relevant behaviors in challenging situations (Grossmann, Gerlach, & Denissen, 2016). Wisdom-relevant cognition may additionally be facilitated through the enactment of IH (Grossmann, 2017; Whitcomb, Battaly, Baehr, & Howard-Snyder, 2015).

A number of conceptualizations of IH have emerged from the virtue epistemology literature in philosophy. In this investigation, IH has been primarily conceptualized in terms of a disposition to be alert to, admit to, and take responsibility for cognitive limitations and mistakes (Whitcomb, Battaly, Baehr, & Howard-Snyder, 2015). However, a number of alternative definitions of intellectual humility have emerged. One influential account, sometimes termed the "low concern" account of intellectual humility, has been proposed by Roberts and Wood (2007). In their definition of IH, Roberts and Wood identify fourteen vices which they conceptualize to be in opposition to the enactment of intellectual humility: arrogance, vanity, conceit, egotism, hyper-autonomy, grandiosity, pretentiousness, snobbishness, impertinence (presumption), haughtiness, self-righteousness, domination, selfish ambition, and self-complacency. Their "low concern" account describes intellectual humility as a virtue of "absence" – that is, IH is understood as the absence of these intellectual vices.

However, Whitcomb et al. (2015) argue that a lack of concern for status is not a sufficient to characterize the presence of IH. Indeed, a simple lack of intellectual arrogance is not indicative of the presence of IH, as it could instead be the marker of a complete lack of confidence or ability, rather than proper attentiveness to one's knowledge. As such, they claim that significant limitations exist in Roberts and Wood's (2007) "low concern" account of IH. These concerns are arguably alleviated by adopting the "limitations owning" conceptualization, which presents IH as a middle ground between intellectual arrogance — that is, overconfidence in the value of one's intellectual abilities and ideas — and a complete lack of confidence in the value of one's intellectual abilities and ideas. In the "limitations owning" account, therefore, intellectual humility cannot be understood as the absence of arrogance, vanity, conceit, egotism, hyper-autonomy, grandiosity, pretentiousness, snobbishness, impertinence (presumption), haughtiness, self-righteousness, domination, selfish ambition, and self-complacency (as described by Roberts and Wood, 2007), but instead is more accurately conceptualized as a proper awareness of and attentiveness to intellectual limitations.

**Measurement of IH.** Relatedly, Zachry, Phan, Blackie, and Jayawickreme (2018) noted a similar variation in how IH has been defined in the psychology literature. Leary et al. (2017) conceptualized IH in terms of recognizing the fallibility of particular personal beliefs accompanied by appropriate attentiveness to the evidence available for that belief, as well as one's own limitations in obtaining and evaluating relevant information. Hoyle, Davison, Diebels, and Leary (2016) offer a variation on this view and apply this definition to specific personal views. Alternatively, Meagher et al. (2015) emphasize "an accurate or modest assessment" of one's intelligence, being receptive to

the contributions of others, and being able to accept criticism about one's own ideas. McElroy et al. (2014) provide a third distinct definition, which emphasizes both insight about the limits of one's knowledge, involving in particular openness to new ideas, and regulating arrogance, marked by the ability to present one's ideas in a non-offensive manner and receive contrary ideas without taking offense, even when confronted with alternative viewpoints. Finally, Krumrei-Mancuso and Rouse (2016) identify four distinct dimensions of IH: independence of intellect and ego, openness to revising one's viewpoints, respect for others' viewpoints, and lack of intellectual overconfidence.

Although it should be noted that some definitions of humility incorporate aspects of IH (see Chancellor & Lyubomirsky's, 2013, identification of "openness to new information" as a hallmark of humility), all definitions of IH all clearly distinguish it from general humility, as well as emphasizing the fallibility of possessed knowledge. However, insofar as one defines IH as a disposition to be alert to, and to 'own' cognitive limitations and mistakes (following Whitcomb et al., 2015), many of the above definitions are problematic for capturing this core feature. For example, Meagher et al. (2015) focus on "an accurate or modest assessment" of one's intelligence, thus conflating accuracy of one's knowledge with moderate estimations (which may sometimes be underestimations) of one's beliefs. Similarly, McElroy et al.'s (2014) definition weighs a lack of arrogance as being equal in importance to insight into the limits of one's knowledge, thus adding an additional criterion to the possession of IH (of note, this added dimension may be an attempt to incorporate an additional philosophical perspective on IH provided by Roberts & Wood, 2007). Krumrei-Mancuso & Rouse's (2016) extends this definition, adding dimensions that arguably represent outcomes that IH would predict

as opposed to core dimensions of the constructs itself. Their definition includes dimensions such as “independence of intellect and ego,” which is described as a lack of feeling threatened by disagreements about intellectual topics. Such over-inclusion of dimensions represents examples of “concept creep” into the area on IH (Tangney, 2000).

Of the existing measures of IH, Leary et al.’s (2017; see also Hoyle et al., 2016) definition is the closest to Whitcomb and colleagues’ (2015) definition of IH as a disposition to be alert to and to ‘own’ cognitive limitations and mistakes. The six-item measure by Leary et al. (2017) aligns closely with the idea of admitting fallibility of one’s ideas that is central to IH (Whitcomb et al., 2015). However, the scale’s brevity means that it prioritizes reliability over breadth and therefore may be missing content that is relevant to understanding the manifestation of IH-relevant qualities in daily life. To combat these issues in measurement of IH, Zachry et al. (2018) created the Trait-State Intellectual Humility Scale, which is designed to assess the core feature of IH and also sample an adequate range of thoughts, feelings, and behaviors associated with IH in daily life experiences.

Empirical assessments of wisdom are similarly characterized by a lack of consensus regarding conceptualizations of wisdom (Glück, 2018). However, Grossmann et al. (2016) have asserted that wisdom is best assessed through daily manifestations of wise reasoning and behaviors. While they have identified IH as one such wisdom-related construct, their state assessment of IH comprises just one item on gathering more information and two items on the potential impact of challenging experiences, as opposed to directly assessing IH as acknowledging one’s limitations. Brienza et al.’s (2017) contextualized measure includes four items assessing IH, which focus on double-

checking one's information before formulating one's opinion (e.g., "*I double-checked whether my opinion on the situation might be incorrect*"; "*I double-checked whether the other person's opinions might be correct*"; "*I looked for any extraordinary circumstances before forming my opinion*"; "*I behaved as if there may be some information to which I did not have access*"), as well as four items assessing change and multiple outcomes that are arguably relevant to IH (e.g., "*I often consider multiple ways how social situations may unfold*"). While the assessment of IH as an acknowledgement of the limits of one's knowledge is indeed consistent with the core conception of the trait as a disposition to be alert to and 'own' one's cognitive limitations and mistakes (Whitcomb et al., 2015), Zachry et al. (2018)'s state version of the measure expanded on Brienza et al.'s (2017) work by providing a more comprehensive assessment of IH in daily life.

Despite the fact that interest in IH has only developed recently in psychology, initial findings highlight a number of positive outcomes associated with IH. For example, Deffler, Leary, and Hoyle (2016) found that people who were higher in IH were better able to distinguish between new and old information on recognition memory tasks than were individuals lower in IH. In addition, people low in IH showed more confidence in their incorrect responses than did people high in IH. Further, individuals high in IH spent more time reading and considering sentences which opposed their own viewpoints, which is indicative to the openness to new ideas associated with IH.

Hook et al. (2015) reported that in cases of transgressions by a religious leader, those religious leaders perceived to have more IH toward religious beliefs were more easily forgiven for their wrongdoing. These results were replicated in a second sample, and the researchers conducted moderation analyses to examine whether the nature of the

transgression (i.e., religious or other, which included financial and sexual transgressions) moderated the relationship between perceived IH and forgiveness. The researchers further found that the relationship was strongest for religiously affiliated transgressions than for those categorized as non-religious in nature.

An additional study by Hook and colleagues (2017) examined religious tolerance and IH among Christian pastors. The research found that IH was positively predictive of greater religious tolerance among Christian pastors. Further, they reported an interaction between IH and experience with religious diversity, such that Christian pastors who had been exposed to religious diversity were more forgiving only if they were also high in IH.

### **Wisdom and Positive Outcomes**

Moreover, as IH is considered a key component of wisdom (Grossmann et al., 2016), it is important to understand the associations with other wisdom-relevant dimensions. Although wisdom has long been a valued characteristic among theologians and philosophers (Lambert, 1960), psychological research on wisdom has only gained in prominence in the last twenty years (Sternberg, 1990). Researchers have conceptualized five main components to wise reasoning: IH/recognizing one's limitations, recognition of others' perspectives/broader contexts, recognition of uncertainty and change, integration of different opinions/compromise and the ability to adopt a distanced or unbiased viewpoint in reasoning about a personally relevant issue (Brienza et al., 2017; Grossmann, 2017; Grossmann et al., 2013, 2016; Kross & Grossmann, 2011). In addition to the direct relationships among IH and the aforementioned positive outcomes, the broader construct of wisdom — of which IH is a key component (Grossmann et al., 2016) — has been found to be associated with higher levels of life satisfaction (Ardelt, 1997;

Grossmann et al., 2013), reduced depressive rumination, longevity (Grossmann et al., 2013), intrapersonal strength, and self-perceived post-traumatic growth (Webster & Deng, 2014).

Indeed, the link between wisdom and positive change after the experience of adversity has long been a topic of discussion for researchers interested in post-traumatic growth (PTG; Tedeschi & Calhoun, 1996, 2004). Although PTG has primarily been conceptualized in terms of five domains — increased personal strength, recognition of new opportunities in one’s life, spiritual growth, improved interpersonal relationships and greater appreciation for life — PTG researchers have also posited that the process by which people adapt after adversity may yield benefits in addition to growth in the five domains of PTG (Calhoun, Cann, & Tedeschi, 2010).

One proposed long-term benefit to PTG is increased levels of wisdom (Calhoun, Cann, & Tedeschi, 2010). Linley (2003) theorized that wisdom may not only be an outcome of PTG, but a part of the adaptation and growth process after the experience of trauma as well. In particular, Linley identified three dimensions of wisdom which are especially relevant to PTG. Two of these dimensions – managing and recognizing uncertainty, along with recognition and acceptance of one’s limitations – have substantial overlap with current conceptualizations of IH (Whitcomb et al., 2015; see also Jayawickreme & Blackie, 2016). Linley’s call for further research on the relationships between PTG and wisdom, combined with the call to explore IH as an integral component of wisdom, has greatly informed the purpose of the present research. As wisdom is considered to have a role in PTG as both a process and an outcome (Linley,

2003), and IH is considered to be a key aspect of wisdom (Grossmann et al., 2016), it follows that IH may both predict and constitute a key dimension of PTG.

### **Current Interventions for PTG, Wise Reasoning, and Humility**

Current research has explored interventions to facilitate PTG. To provide one example, Roepke, Benson, Tsukayama, and Yaden (2017) examined the effectiveness of a weekly prospective writing intervention on participants' current-standing and retrospective reports of PTG over a four-week period. Prospective tasks involve asking participants to look forward to the future, and to identify possibilities for an improved future. Researchers in positive psychology have posited that the ability to look beyond the present moment and make evaluative judgments on possibilities for the future involves a mechanism integral to achieving positive psychological functioning (Seligman, Railton, Baumeister, & Sripada, 2013). The prospective writing task in the study by Roepke et al. (2017) asked participants to describe new opportunities that they have recognized in their own lives since the experience of trauma. The researchers found that, by comparison to a factual writing condition and a non-action control condition, the participants in the prospective writing condition reported higher levels of current-standing PTG.

Further, research by Kross and Grossmann (2011) has explored interventions to promote heightened wise reasoning. Their research echoes a body of wisdom literature which suggests that while individuals in Western cultures have a particularly hard time reasoning about personally-relevant issues from a holistic and objective perspective (Epley & Caruso, 2008), removing the context of emotional and personally meaningful aspects of a situation is an integral skill to accomplish global wise reasoning (Kross &

Ayduk, 2011; Trope & Liberman, 2010). Kross and Grossmann (2011) endeavored to determine whether an intervention asking participants to adopt a distanced perspective in reasoning about personally-relevant issues may be effective in enhancing wise reasoning. In two studies, the researchers asked participants to reflect upon and reason about personally-relevant issues. Some participants were asked to reflect and reason from their own perspective, while others were asked to adopt a self-distanced perspective (e.g., reflecting on and reasoning about a U.S. election from own perspective [citizen of U.S.] or from a distanced perspective [citizen of Iceland]). The researchers found that participants in the self-distancing conditions showed more wisdom in their reasoning than did participants in the immersed perspective conditions.

Although interventions to promote IH are absent from the literature at present, one intervention was developed by Lavelock and colleagues (2014) to promote general humility. In order to fully elaborate on this research, and its possible relationship to IH interventions, it is worth revisiting the distinction between IH and general humility. While general humility lacks a consensus definition, Tangney (2000, p. 73) arguably captures its essence by highlighting the following aspects:

- accurate assessment of one's abilities and achievements (not low self-esteem, self-deprecation).
- ability to acknowledge one's mistakes, imperfections, gaps in knowledge, and limitations (often vis-a-vis a "higher power").
- openness to new ideas, contradictory information, and advice.

- keeping of one's abilities and accomplishments one's place in the world in perspective (e.g., seeing oneself as just one person in the larger scheme of things).
- relatively low self-focus, a "forgetting of the self," while recognizing that one is but one part of the larger universe.
- appreciation of the value of all things, as well as the many different ways that people and things can contribute to our work.

While many of these qualities are conceptually distinct from IH (e.g., keeping accomplishments in perspective, low self-focus), it is not difficult to begin to recognize the conceptual similarities between the two (e.g., openness to new ideas, acknowledging [cognitive] limitations). As such, it stands to reason that if general humility, post-traumatic growth and wise reasoning can be successfully promoted through reflection and writing-based interventions, such interventions may be similarly effective in promoting IH and its associated positive outcomes.

Regarding the research on general humility interventions, Lavelock et al. (2014) developed a workbook consisting of daily reflection and writing tasks. Participants in the study completed these workbook tasks over the span of two weeks. An example task, which is similar to Kross and Grossmann's (2011) work exploring wise reasoning in relation to self-distancing, asked participants to reflect on a time in which they behaved in a way that was *not* humble. Participants were then asked to reflect on that event from their own perspective, specifying behaviors that could be changed to convey more humility in the future, before trying to imagine and reflect on the same event from the perspective of an objective third-party. In their research, Lavelock et al. (2014) reported

significant group differences between the humility condition, which completed the general humility workbook tasks, and the control condition. Namely, the group that received the intervention showed improvement in their levels of general humility, forgiveness and patience.

Kross and Grossmann (2011) reported enhanced wise reasoning among individuals who reflected on personally-relevant issues from a distanced perspective, while Roepke et al. (2017) reported gains in current-standing PTG among participants who completed a weekly prospective writing task. While the intervention study by Lavelock et al. (2014) focused on different positive outcomes than those that are addressed in the present research, there are conceptual similarities between general humility and the limitations-owning conceptualization of IH (Tangney, 2000; Whitcomb et al., 2015). These findings, along with the ability of the workbook intervention to promote IH-relevant positive behaviors such as forgiveness (Hook et al., 2015), provide a promising outlook for the ability of the present intervention to promote IH, among other positive, wisdom-relevant outcomes.

### **The Present Study**

The present research had two main purposes: to develop an intervention to IH, and to advance research regarding the benefits of IH. Specifically, the project aims to address relationships between IH, tolerance, well-being, and wise reasoning. I was interested in understanding how best to promote IH and IH-relevant behaviors, as well as examining which other positive outcome variables may be influenced by an increase in IH. The dependent variables – IH, tolerance, well-being and wise reasoning – were chosen based not only on previous evidence which suggests that they are correlates of IH

(Zachry et al., 2018), but also based on their theoretical relevance to the mechanisms involved in each of the interventions tested in the present research.

Specifically, in recognizing one's limitations, IH necessarily requires individuals to consider alternative perspectives. Similarly, tolerance requires individuals to be accepting of others despite the possibility of conflicting views (Jackson, 1994). Finally, as IH is recognized as a key component of wisdom (Grossmann et al., 2016), we were interested in assessing the effectiveness of an IH-targeted intervention on promoting other core aspects of wise reasoning.

### **Hypotheses**

H1: Participants in the prospective writing condition will show an increase in IH and a small to moderate increase in tolerance, well-being, and wisdom. The prospective writing mechanism has been shown to be effective in promoting PTG (Roepke et al., 2017). Given this fact, and the theoretical links between PTG, wisdom and IH, we would expect improvements in IH using a targeted prospective writing intervention. Since the intervention is targeted specifically at having respondents identify goals to become more intellectually humble, we expect participants to attempt to follow through on those goals from week to week, thus improving their IH. As previous research has shown strong relationships between IH and both wisdom (Grossmann et al., 2016) and tolerance (Zachry et al., 2018), we expect requisite increases in each of these variables as IH increases. Finally, as the prospection mechanism has been identified as a core part of positive psychological functioning (Seligman et al., 2013), we expect to find that prospective writing about IH leads to greater well-being by increasing positive thinking about one's future prospects.

H2: Participants in the self-distancing condition will show the greatest increase in IH and in the outcome variables. In accordance with Kross and Grossmann's (2011) research on individuals' ability to better examine personally-relevant situations from a distanced perspective, we would expect that IH, a key component of wisdom and wise reasoning, would benefit from a self-distancing intervention more than it would benefit from a prospective writing intervention. With change in IH, and the ability to adopt an objective perspective, we would also expect to see requisite improvements in tolerance, due to its focus on valuing the perspectives, experiences and differences of others. Further, we would expect increases in wise reasoning to emerge from this wisdom-centric mechanism, and as research has shown (Ardelt, 1997; Grossmann, 2013), increased wisdom is associated with greater well-being.

## METHODS

### Participants

Participants are students enrolled in an Introductory Psychology course at a private university in the Southeast United States. A total of 176 participants enrolled to participate in the study. Although the participants self-selected into the study, they were then randomly assigned to their condition. A number of responses were excluded from analyses: 28 were excluded for failure to complete the pre-test, 1 participant was excluded for responding to the pre-test twice, 12 participants were excluded for failing to complete the post-test. After removing these excluded responses, we were left with a total sample size of 135; control ( $n = 37$ ), factual writing ( $n = 31$ ), prospective writing ( $n = 32$ ), or self-distancing ( $n = 35$ ). The sample was 62.1% female ( $n = 82$ ) and 37.9% male ( $n = 50$ ), while 3 participants did not report their sex. Of the participants who reported their race, 80.8% were White ( $n = 105$ ), 13.1% were Asian ( $n = 17$ ), 5.4% were Black ( $n = 7$ ) and 0.8% were Native Hawaiian or Pacific Islander ( $n = 1$ ). Participants received 1.5 credits towards their research participation requirement for introductory psychology.

### Procedure

The study was completed in four parts. First, participants completed four trait measures as part of mass testing for Introductory Psychology students at the beginning of the semester; the Trait-State Intellectual Humility Scale (Zachry et al., 2018), the Situated Wise Reasoning Scale (Brienza et al., 2017), the Flourishing Scale (Diener et al., 2009) and the Tolerance subscale of the International Personality Item Pool Jackson Personality Inventory (Goldberg et al., 2006). These trait measures constituted the pre-test portion of the study for those individuals who chose to participate in the study later in the semester.

For the second part of the study, all participants signed informed consent documents prior to watching a 15-minute film. The control condition participants were not exposed to any part of the IH intervention, and their study participation consisted of exclusively non-IH-relevant information. The control condition watched a film containing factual information that is not pertinent to IH. This video was a TED talk by Dr. Brian Little, titled “Who are you, really? The puzzle of personality” in which Dr. Little explains Big Five personality characteristics, mostly focusing on Extraversion. This video was selected for the control condition as it is nearly identical in length to the IH video, and the content is similarly engaging. Moreover, one aim of selecting this particular video was that participants would be less likely to become aware that they were in the control condition, as they were enrolled to participate in a study called “Student Experiences and Personality Characteristics,” watching and responding to questions about personality characteristics in relation to the video content.

The other three conditions watched a film about IH, which describes the story of two scientists who made the same discovery, but responded to the results differently. The IH film was based on articles by Barber and Fox (1958) and Napolitano (2013) which describe the story of Drs. Thomas and Kellner, who simultaneously observed a phenomenon in their research on rabbits. Both scientists were injecting the enzyme papain into rabbits to observe the cardiovascular effects, and the ears of both scientists’ unexpectedly begun to droop. While Dr. Kellner shelved the project due to the facts that he could not explain this unexpected phenomenon and that it did not pertain directly to his research, Dr. Thomas’ continued to pursue the research, comfortable in accepting the boundaries of his understanding of the situation. Eventually, Dr. Thomas’ research

brought him up against evidence that boldly contradicted everything that he and the scientific community believed that they knew about cartilage. Still, he persisted in his research and sought perspectives from students and colleagues, and ended up advancing scientific understanding of cartilage through his intellectual humility.

After watching the video associated with their randomly assigned condition, all participants were required to answer factual comprehension questions, to ensure that they paid attention to the video and that they understood its content. To review the comprehension questions for the control video and IH film, see Appendix A.

Within one week of completing the initial session, participants received the instructions for the third part of the study via email. The second part of the study entailed a 10-minute writing task, completed once per week for four weeks. There were three conditions for the writing task; factual writing, prospective writing and self-distancing. The control condition and factual writing condition completed a factual writing task similar to the control tasks used in other research (e.g., Pennebaker & Beall, 1986; Roepke, Benson, Tsukayama, & Yaden, 2017). The factual writing task simply asked participants to recall the events of the previous 24 hours in detail. The prompt for the factual writing task can be found in Appendix C. The control condition completed the factual writing task in order to make their participation as similar to the other conditions as possible, and to ensure that any changes seen throughout the study are not simply a result of the act of writing about oneself or one's life events and interactions with others. As the participants in the factual writing condition were made aware of the concept of IH through watching the video, this condition exists to ensure that participants' awareness of the concept of IH, in conjunction with writing about oneself, one's life events or one's

interactions with others, is not sufficient to change trait scores on the dependent variables.

The prospective writing condition completed a writing task in which they reflect on their own intellectual humility, and identify opportunities to improve their intellectual humility. The prospective writing task follows from the literature surrounding interventions to promote post-traumatic growth. The prompt, which can be found in Appendix D, was adapted from Roepke et al.'s (2017) work on facilitating post-traumatic growth through prospective writing.

Participants in the self-distancing writing task condition completed a writing task in which they consider *others' perceptions* of their actions. This methodology follows from the research of Kross and Grossmann (2012), which suggests that wise reasoning is facilitated through reasoning about self-relevant issues through a perspective that is psychologically distanced from their own. By adopting a distanced perspective, people are better able to look at the concrete details of the situation, rather than the implications that it has for them personally. The prompt for the self-distancing writing task can be found in Appendix E.

For the final part of the study, the post-test, participants responded again to the same four trait measures from the pre-test. This part of the study was completed online.

## **Materials**

*Videos (link in Appendix F).* Students in the control condition watched a video explaining information about personality psychology. Students in the factual writing, prospective writing and self-distancing conditions watched a video which explains the story of two scientists who took different approaches to the same discovery. Once

scientist responded in an intellectually humble manner, while the other did not. Links to both videos can be found in Appendix F.

***Intellectual humility (Appendix G).*** The 11-item trait version of the Trait-State Intellectual Humility Scale (Zachry et al., 2018) was used to measure IH. Example items include “I search actively for reasons why my beliefs might be wrong,” and “When solving a problem, I prefer to seek a second opinion from someone who has a different point of view from my own.” Participants rated the extent to which they feel that the statements describe themselves on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

***Tolerance (Appendix H).*** The 9-item Tolerance subscale of the IPIP Jackson Personality Inventory (Goldberg et al., 2006) was used to measure tolerance. Example items include “I am open to change” and “I find it hard to forgive others (R).” Participants rated the extent to which they feel that the statements describe themselves on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

***Wisdom (Appendix I).*** The 21-item Situated Wise Reasoning Scale (Brienza et al., 2017) was used to measure wisdom. Example items include “I put myself in the other person’s shoes” and “I thought about whether an outside person might have a different opinion from mine about the situation.” Although the Situated Wise Reasoning Scale typically employs a 5-point scale, pre-test responses were scored on a 7-point scale (1 = strongly disagree, 7 = strongly agree) due to a mass-testing coding error. Post-test scores were originally recorded on a 5-point scale, but were transformed to a 7-point scale in order to best accommodate the coding error. Participants respond to the Situated Wise

Reasoning items about a particular event, after completing an event reconstruction task to recall that event.

*Well-being (Appendix J).* The 8-item Flourishing Scale (Diener et al., 2009) was used to measure well-being. Example items include “I lead a purposeful and meaningful life.” Participants rate the extent to which they feel that the statements describe themselves on a 7-point scale (1 = strongly disagree, 7 = strongly agree).

## ANALYSES

Outliers were identified and removed from the sample prior to conducting analyses. Outliers were defined as responses whose mean score on any outcome variable was greater than three standard deviations away from the mean score. In total, 12 responses were identified as outliers on one or more pre- and/or post-test outcome variables.

A one-way ANOVA can be conducted to assess any pre-existing group differences on any of the outcome variables. Due to the fact that the participants were randomly assigned to conditions, there should not be pre-existing differences between groups on any of the dependent variables. In the case that one-way ANOVA omnibus analyses are significant, pre-existing group differences on outcome variables are assessed further to determine where those differences exist. Once those differences have been isolated, statistical adjustments can be made to account for group differences.

In order to analyze whether there are significant differences on multiple outcome variables between groups, a one-way MANOVA can be conducted. A one-way MANOVA tells us whether there are significant differences among any of the groups, and post-hoc contrasts are used to determine the differences between groups, and a post hoc Bonferroni correction procedure ensures that the Type I error rate is not inflated. The primary question being addressed by these analyses is whether or not experimental condition has an influence on the four dependent variables of interest. To ensure that a MANOVA is the appropriate analysis given the data, correlations should first be examined to determine whether they are moderate – that is, whether they suggest some

relationship between the dependent variables, but are not so strong as to suggest multicollinearity.

The MANOVA consists of an omnibus analysis of differences in the dependent variables (IH, tolerance, wisdom, well-being) based on the level of the independent variable (control, factual, prospective, self-distancing). If a MANOVA indicates that there is a significant difference between conditions, one should run ANOVAs on each of the dependent variables before conducting contrast comparisons on dependent variables with significant ANOVA results. In concordance with our expectations, the planned orthogonal contrasts are as follows:

- Control + factual = prospective + self-distancing
- Factual = control
- Prospective = self-distancing

## RESULTS

A total of 12 responses were identified as outliers on one or more dependent variable, in excess of three standard deviations from the mean. These outliers included 2 responses for each the IH pre-test and tolerance pre-test, 3 outliers on each the flourishing pre-test and the wisdom post-test, and 1 outlier on each the wisdom pre-test and the IH post-test. These responses were excluded from subsequent analyses.

A one-way ANOVA determined that there were no significant pre-existing differences among groups on the IH ( $p = .67$ ), Tolerance ( $p = .58$ ), Flourishing ( $p = .61$ ) or Wise Reasoning ( $p = .32$ ) pre-tests (Table 1). Pre-test scores for IH As none of the group differences approached statistical significance, we can determine that the random assignment of conditions was effective. No further statistical adjustments must be made.

Table 1

ANOVA of pre-existing group differences

	<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
IH	.52	3	.67	.02
Tolerance	.66	3	.58	.02
Flourishing	1.19	3	.32	.02
Wisdom	.58	3	.63	.03

Four participants were excluded from the remaining analyses as a result of completing fewer than half of the writing prompt responses (0 or 1 response[s]). These participants were excluded because it was determined that a possible intervention would

Table 2

Descriptive statistics for dependent variables at Time 1 and Time 2

DV	Time	Condition	Mean	<i>SD</i>	Range
IH	T1	Control	3.73	.42	2.00
	T1	Factual	3.81	.40	1.91
	T1	Prospective	3.86	.51	1.91
	T1	Self-distancing	3.86	.53	1.91
	T2	Control	3.81	.56	2.27
	T2	Factual	3.86	.50	2.27
	T2	Prospective	3.95	.55	2.27
	T2	Self-distancing	3.90	.52	2.09
Tolerance	T1	Control	4.02	.41	2.00
	T1	Factual	3.98	.37	1.33
	T1	Prospective	3.91	.43	2.11
	T1	Self-distancing	4.06	.48	2.11
	T2	Control	3.85	.50	2.00
	T2	Factual	3.65	.57	2.11
	T2	Prospective	3.77	.58	2.78
	T2	Self-distancing	3.61	.55	2.22
Wisdom	T1	Control	4.92	.80	3.05
	T1	Factual	5.21	.93	3.76
	T1	Prospective	5.00	.94	3.52
	T1	Self-distancing	5.31	1.04	3.95

	T2	Control	5.02	.83	3.43
	T2	Factual	5.29	.72	3.36
	T2	Prospective	5.43	.66	2.71
	T2	Self-distancing	5.15	.83	3.79
Flourishing	T1	Control	50.03	5.68	18.00
	T1	Factual	48.61	5.89	21.00
	T1	Prospective	48.75	4.91	22.00
	T1	Self-distancing	48.28	6.07	22.00
	T2	Control	47.91	6.54	24.00
	T2	Factual	45.89	6.00	23.00
	T2	Prospective	48.38	7.21	25.00
	T2	Self-distancing	47.41	6.72	23.00

---

likely be ineffective if completed fewer than half of the intended times. Descriptive statistics for the remaining responses are presented in Table 2. Prior to running the one-way MANOVA, Pearson correlations were computed to ensure that the relationships among the dependent variables were sufficient for MANOVA analyses (Table 3).

Planned analyses included a one-way MANOVA to assess differences between groups on multiple dependent variables. MANOVA results indicated no significant differences among groups,  $F(12, 296.62) = 1.21, p = .28$ ; Wilk's  $\Lambda = 0.88$ , partial  $\eta^2 = .04$ . However, given these Pearson correlation values, a MANOVA was not justified, and one-way ANOVAs for each dependent variable were instead selected to analyze the responses.

Table 3

Correlations among Time 1 and Time 2 scores on dependent variables

	IH T1	IH T2	Tol. T1	Tol. T2	Flourish T1	Flourish T2	Wisdom T1	Wisdom T2
IH T1	1	-	-	-	-	-	-	-
IH T2	.43**	1	-	-	-	-	-	-
Tol. T1	.32**	.27**	1	-	-	-	-	-
Tol. T2	.15	.32**	.57**	1	-	-	-	-
Flourish T1	.01	.20*	.29**	.23*	1	-	-	-
Flourish T2	.08	.37**	.20*	.32**	.54**	1	-	-
Wisdom T1	.17	.08	.32**	.08	.15	-.05	1	-
Wisdom T2	.16	.30**	.03	.13	.20*	.12	.17	1

\* indicates  $p < .05$ , \*\* indicates  $p < .01$ 

Given the unexpected correlations among the dependent variables at Time 1 and Time 2, I examined reliability analyses to ensure that the scales were sufficiently reliable. Reliability analyses for each dependent variable were conducted on the scale at Time 1, Time 2, and then examined across time points. The Trait-State IH Scale (Zachry et al., 2018) was found to be reliable at Time 1 ( $\alpha = .76$ ), Time 2 ( $\alpha = .84$ ) and overall ( $\alpha = .85$ ). The Jackson Personality Inventory Tolerance Scale did not show sufficient reliability at Time 1 ( $\alpha = .54$ ), but was found to be reliable at Time 2 ( $\alpha = .71$ ) and overall ( $\alpha = .77$ ).

The Situated Wise Reasoning Scale (Brienza et al., 2017) was found to be reliable at Time 1 ( $\alpha = .90$ ), Time 2 ( $\alpha = .88$ ) and across time points ( $\alpha = .90$ ). Finally, the Flourishing Scale (Diener et al., 2009) was also reliable at Time 1 ( $\alpha = .86$ ), Time 2 ( $\alpha = .93$ ) and overall ( $\alpha = .92$ ).

One-way ANOVA results (Table 4) indicated one difference between groups on Tolerance,  $F(3, 115) = 3.26, p = .02$ . Planned contrasts and Bonferroni corrections were

Table 4

ANOVA of between-subjects effects in dependent variables

	<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
IH $\Delta$	.16	3	.93	.00
Tolerance $\Delta$	3.26	3	.02	.08
Flourishing $\Delta$	1.39	3	.25	.04
Wisdom $\Delta$	1.48	3	.22	.04

Table 5

## Tolerance contrast results

Contrast	Value	Std. error	<i>t</i>	<i>df</i>	<i>p</i>
Control + Factual = Prospective +					
Self-distancing	.09	.17	.54	115	.59
Control = Factual	.15	.12	1.30	115	.20
Prospective = Self-distancing	.31	.12	2.62	115	.01

used to explore this relationship further (Tables 5 and 6). The planned orthogonal contrast results showed a significant difference between the prospective and self-distancing conditions on tolerance,  $t(115) = 2.62, p = .01$ . However, after the Bonferroni correction to avoid the inflation of the Type 1 error rate from running multiple one-way ANOVAs, this difference reached only marginal significance ( $M \Delta = +/- .31, p = .06$ ), with individuals in the prospective writing condition changing more than those in the self-distancing condition on tolerance. Further, given the theoretical and conceptual basis for this study, as well as the number of relationships assessed and the relatively low scale reliability at each time point (T1  $\alpha = .54$ , T2  $\alpha = .71$ ), it is likely that this result is a Type 1 error, rather than a true finding.

Table 6

Bonferroni corrected values for Tolerance one-way ANOVA

DV	Condition 1	Condition 2	Mean difference	Std. Error	<i>p</i>	95% CI Lower-Upper
Tol. $\Delta$	Control	Factual	.15	.117	1.00	-.16 - .18
		Prospective	-.04	.116	1.00	-.35 - .28
		Self-distancing	.28	.116	.11	-.03 - .59
	Factual	Control	-.15	.117	1.00	-.47 - .16
		Prospective	-.19	.121	.74	-.51 - .14
		Self-distancing	.13	.121	1.00	-.20 - .45
	Prospective	Control	.04	.116	1.00	-.28 - .35
		Factual	.19	.121	.74	-.14 - .51
		Self-distancing	.31	.120	.06	-.01 - .64
	Self-distancing	Control	-.28	.116	.11	-.59 - .03
		Factual	-.13	.121	1.00	-.45 - .20
		Prospective	-.31	.120	.06 <sup>+</sup>	-.64 - .01

<sup>+</sup> indicates marginal significance

## GENERAL DISCUSSION

The present study's null findings do not support Hypothesis 1, which expected that participants in the prospective writing condition would show increases on all four dependent variables relative to the control and factual writing conditions. Further, the present research does not provide support for Hypothesis 2, which expected that the self-distancing intervention would be the most effective in promoting IH, tolerance, well-being and wise reasoning.

### **Limitations**

A number of limitations may explain the observed results. First, while the original goal was to recruit 340 participants in order to achieve sufficient power (see Appendix A for projected power analyses), there was a great deal of difficulty in recruiting participants to take part in the study. The study was marked by a lack of interest from students in the participant pool – we were left with over 150 unused credits despite repeated efforts to make students aware of the open spots in the study. Due to a misunderstanding, participants were also not required to complete mass-testing (the pre-test) before registering for the present study. As a result, 28 responses were discarded due to a lack of pre-test response and our sample size was substantially reduced.

The longitudinal nature of the study also interfered with our ability to have an extended recruiting window for participants. As each participant's study participation lasted no fewer than four weeks, we were unable to accommodate possible participants who wait until later in the semester to complete their study credit hours. Additionally, as with many studies conducted with Introductory Psychology students, our sample may not be representative of the effectiveness of such interventions in populations with different

or more diverse characteristics. The prevalence of outliers may suggest responding fatigue or motivational challenges in participants, and may imply that the findings of the study — or lack thereof — are not necessarily indicative of the true effect of the interventions.

Further, there was a considerable attrition across the course of the study, making many responses that were collected unusable. Similarly, in their prospective writing study with participants recruited online, Roepke et al. (2017) experienced a substantial amount of attrition across the course of the study. This lack of commitment may have been due to the longitudinal nature of the study. However, due to the nature of the incentives offered to participants in the Introductory Psychology pool, it may be that while participants who lacked the motivation to continue for the full course of Roepke et al.'s (2017) prospective writing study were able to discontinue their participation at will, participants in the Introductory Psychology subject pool who lacked the motivation required to be effective participants felt obligated to remain in the study, thereby affecting the quality of the data. In future research, this could be alleviated by recruiting participants online who are likely to be more motivated to participating in research, or by offering additional incentives (such as bonus credits to students who complete all parts or, in online or community samples, monetary compensation).

Additionally, although 72.6% of participants in the relevant conditions correctly identified IH as the construct of interest after watching the IH video, a number of writing prompt responses in the prospective writing and self-distancing conditions suggest that the aims of these prompts may have been unexpectedly challenging for participants to understand or achieve. In order to better understand this issue, I coded responses to both

the prospective writing and self-distancing conditions for understanding of the definition of IH, as well as the presence of a future action-oriented idea to improve one's intellectual humility. Further, I coded self-distancing prompt responses for participants' ability to maintain an unbiased perspective by keeping emotional content out of their responses. For example, responses in which participants wrote at length about feeling tired, stressed, frustrated, etc., or in which they disparaged others' viewpoints under the guise of objectivity (i.e., "an unbiased observer would agree with me that gun control is stupid") were coded as failing to maintain an unbiased perspective.

Although the mechanism for prospective writing interventions relies on thinking ahead towards future possibilities, participants seemed to have particular difficulty in responding to this aspect of the prompt. Of 149 total responses to the prospective writing prompt, only 28.6% of responses successfully provided suggestions for ways in which IH could be improved in the weeks to come. Examples of successful and unsuccessful responses to the prospective writing prompt can be found in Appendix K.

Moreover, whereas the overarching goal of the self-distancing prompt was to have participants reason about personally-relevant issues or experiences from an objective perspective, many participants still responded with emotional or biased content. Of 155 total self-distancing prompt responses, only 48.7% of responses were about IH-relevant content and free of bias. Further, only 35.1% of responses in the self-distancing condition successfully provided suggestions for ways in which IH could be improved. Only 20.6% of responses in the self-distancing condition successfully integrated an unbiased perspective on IH-relevant content and suggestions for improving IH. Examples of

successful and unsuccessful responses to the self-distancing writing prompt can be found in Appendix L.

Ultimately, although the impact of the study is inconclusive due to the aforementioned limitations, these limitations do not preclude the possibility that these interventions may be ineffective in promoting IH, tolerance, well-being and wisdom. While the prospective writing and self-distancing interventions have been used successfully in the past in research on promoting PTG (Roepke et al., 2017) and wisdom (Grossmann & Kross, 2013; Kross & Grossmann, 2011) respectively, as both PTG and wisdom are multi-dimensional constructs (Grossmann et al., 2016; Tedeschi & Calhoun, 1996, 2004), it may be the case that IH is not among the dimensions of wisdom affected by such interventions. Further, although previous research has found relationships among IH, tolerance, well-being and wisdom (Zachry et al., 2018), these outcomes may not be of particular relevance to the experiences of Introductory Psychology students, and such relationships may not be generalizable across this sample.

### **Future Research Directions**

Additional research regarding interventions to promote IH could benefit from refining both the prospective writing and the self-distancing prompts. A substantial percentage of participants failed to respond sufficiently to one or more parts of the prompt, and many participants misunderstood or failed to consider the definition of IH with which they were provided. In a study with sufficient power, researchers could code responses for their ability to adhere to the instructions, and exclude those responses which do not meet the criteria from analyses.

As we had trouble in this study with respondents not seeming to understand or respond to the full content of the writing prompt, future research might also reiterate the meaning of IH with each prompt by hearkening back to the video's example, citing Dr. Thomas' intellectual humility in exploring the unexpected phenomenon of the floppy eared rabbits. Moreover, in order to ensure that participants are responding to all parts of the prompt, the questions could be asked separately from one another (i.e. a text box to provide ways that you have been intellectually humble, a text box to provide ways in which you have not, a text box to list specific areas of improvement and a text box to list action items) to ensure complete responses.

For the self-distancing prompt, respondents had difficulty adopting and maintaining an unbiased perspective. Asking participants to write using 3<sup>rd</sup> person language (he/she/they) and reminding them to take the perspective of an objective audience member without allowing their emotions about the situation to cloud their response may help to alleviate this challenge. Future research should explore the effectiveness of these recommendations on both the prospective writing and self-distancing interventions.

Further, it is possible that prospective writing and self-distancing interventions would work to promote IH if administered with greater frequency or for longer periods of time. Although the once per week/four week timeline worked well for Roepke et al. (2017) in promoting PTG, there may be unique challenges or nuance associated with enacting IH in one's daily actions. For example, people may feel more positive affect when thinking about new opportunities on the horizon than they feel when thinking about ways in which they can become better at accepting their own limitations or seeking information that conflicts with their own viewpoint. Additional IH intervention studies can explore

different longitudinal timelines to determine the most effective course for IH-specific interventions.

Future research regarding interventions to promote IH could benefit from exploring these concepts in a larger and more diverse sample, in order to achieve results that have sufficient statistical power and are sufficiently representative of a broader population. As the prospective writing intervention has emerged from the literature surrounding PTG (Roepke et al., 2017), previous prospective writing studies have been conducted in participants who have been exposed to adversity or trauma. Participants in the present study were not assessed for a history of trauma or adversity, and further research could examine the effectiveness of these interventions on IH and additional PTG-relevant outcomes in a sample of individuals who have experienced trauma or adversity.

## CONCLUSION

The present research continues the exploration in psychology of IH and wisdom-relevant traits through testing the effectiveness of existing wisdom-relevant interventions in promoting IH. Participants completed a four-week writing-based intervention, as well as a pre-test and post-test of their trait levels on four outcome variables. In addition to promoting IH, the present study aimed to examine the relationships between IH-targeted interventions and changes in levels of tolerance, well-being and wisdom. These dependent variables have been shown to be associated with IH in past research (Zachry et al., 2018), and there is a strong theoretical basis to hypothesize that the mechanisms behind both prospective and self-distancing writing tasks would have an effect on these outcomes (Ardelt, 1997; Grossmann et al., 2013, 2016; Jackson, 1994; Seligman, et al, 2013). This study follows the work of Roepke et al. (2017) whose prospective writing intervention was successful in promoting PTG, Kross and Grossmann (2011) who provided evidence that self-distancing interventions can improve wise reasoning, and Lavelock et al. (2014) who developed and examined an intervention to promote general humility.

The results of the study did not support the efficacy of the interventions. The one significant group difference — between the prospective writing and self-distancing conditions on change in tolerance — was found to be of only marginal significance once corrections for Type 1 error were performed. Further, given the number of conditions, the number of dependent variables, and the theoretical and empirical basis for the prospective writing and self-distancing conditions, it is difficult to conclude that this marginally significant difference is not simply a Type 1 error. Although this research does not

provide empirical support for the use of prospective writing and self-distancing interventions in promoting IH, the study was helpful in identifying areas of improvement in designing intervention studies for IH and wisdom-relevant traits. The present study came up against a number of unique challenges and limitations, such as a smaller-than-expected sample size and a large percentage of writing responses which did not adhere to the guidelines set forth in the prompt. Moving forward, future research can continue to examine these concepts, and to explore the most effective methodologies for promoting change in IH.

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## APPENDICES

### Appendix A

#### G\*Power analyses.

##### Planned Power

<b>Analysis:</b>	A priori: Compute required sample size – given $\alpha$ , power and effect size		
<b>Input:</b>	Effect size f (estimated)	=	0.1913198
	$\alpha$ err prob	=	0.05
	Power (1- $\beta$ err prob)	=	0.85
	Number of groups	=	4
<b>Output:</b>	Noncentrality parameter $\lambda$	=	12.5915235
	Critical F	=	2.6311745
	Numerator df	=	3
	Denominator df	=	340
	Total sample size	=	344

##### Achieved Power

<b>Analysis:</b>	Post hoc: Compute achieved power – given $\alpha$ , sample size and effect size		
<b>Input:</b>	Effect size f	=	0.2058897
	$\alpha$ err prob	=	0.05
	Total sample size	=	119
	Number of groups	=	4
<b>Output:</b>	Noncentrality parameter $\lambda$	=	5.0444755
	Critical F	=	2.6834991
	Numerator df	=	3
	Denominator df	=	115
	Power (1- $\beta$ err prob)	=	0.4305767

## Appendix B

### IH Video Comprehension Questions.

Q: What change did both scientists notice in the ears of the rabbits who were given papain? [Text entry]

Q: How did Kellner and Thomas differ in their approach to the discovery? [Text entry]

Q: From a scientific standpoint, what was *actually* happening to the rabbits' ears? [Text entry]

Q: The fact that Thomas acknowledged what he did not know, and listened to the ideas of his students is an example of \_\_\_\_\_. [Multiple choice]

- A) Curiosity
- B) Dumb luck
- C) Intellectual Humility
- D) Open-mindedness
- E) Persistence

### Control Video Comprehension Questions

Q: The speaker identified five trait dimensions of personality. Which of these was NOT one of those dimensions? [Multiple choice]

- Extraversion
- Neuroticism
- Agreeableness
- Honesty
- Openness

- Conscientiousness

Q: The speaker pointed out a particular stimulant which appears to affect introverts and extraverts differently. What was it? [Text entry]

Q: After listening to this speaker, do you think that you are more of an introvert or extravert? Why? [Text entry]

Q: How important is science to you? [Sliding 1-10 scale, 10 being most important]

## **Appendix C**

**Factual writing prompt.** Please record the events of the past 24 hours. Focus on who, what, when, and where. Describe them as factually as possible, without inserting your feelings into the narrative. Do not worry if you cannot remember all of the details – just write out the facts that you can recall. All of your writing will be completely confidential. Don't worry about spelling or grammar. The only rule is that once you begin writing, continue to do so until 10 minutes have passed.

## **Appendix D**

**Prospective writing prompt.** Every day, we interact with people whose ideas, opinions, beliefs and values differ from our own. Sometimes, we respond to those new ideas defensively, rather than acknowledging the limitations of our own knowledge/cognitive abilities or listening and being respectful of what we can learn from the ideas of others, a behavior known as intellectual humility. Intellectual humility does not mean surrendering your own ideas or values, or simply being agreeable, but instead means being open to and giving careful consideration to perspectives that differ from your own.

We would like to know about the times that you have displayed intellectual humility this week. For the next 10 minutes, please write down whatever comes to mind about the ways that you have been intellectually humble this week. In addition, please write about the ways in which you feel that you could be more intellectually humble in the coming weeks. All of your writing will be completely confidential. Don't worry about spelling or grammar. The only rule is that once you begin writing, you should continue to do so until 10 minutes have passed.

## **Appendix E**

### Self-distancing prompt

Every day, we interact with people whose ideas, opinions, beliefs and values differ from our own. Sometimes, we respond to those new ideas defensively, rather than acknowledging the limitations of our own knowledge/cognitive abilities or listening and being respectful of what we can learn from the ideas of others, a behavior known as intellectual humility. Intellectual humility does not mean surrendering your own ideas or values, or simply being agreeable, but instead means being open to and giving careful consideration to perspectives that differ from your own.

Imagine that you are a member of the audience in a movie theater watching your behaviors over the past week from a distance. For the next 10 minutes, please write down whatever comes to mind about the ways that an unbiased, distant observer would say that you have been intellectually humble this week. In addition, please write about the ways that an unbiased, distant observer might suggest that you could be more intellectually humble in the coming weeks. All of your writing will be completely confidential. Don't worry about spelling or grammar. The only rule is that once you begin writing, you should continue to do so until 10 minutes have passed.

**Appendix F**

## Control Video

[ted.com/talks/brian\\_little\\_who\\_are\\_you\\_really\\_the\\_puzzle\\_of\\_personality#t-54127](https://www.ted.com/talks/brian_little_who_are_you_really_the_puzzle_of_personality#t-54127)

## IH Video

<https://vimeo.com/172451334>  
password: fox

## Appendix G

### Trait-State IH Scale

Instructions: A number of statements which people have used to describe themselves in general are given below. Read each statement and then select the appropriate answer option to indicate your level of agreement. There are no right or wrong answers.

1. I am willing to compliment the good ideas of those who disagree with me.
2. I view the challenging of my ideas as an opportunity to grow and learn.
3. I appreciate having others provide constructive criticism of my ideas.
4. People would say that I search actively for reasons why my beliefs might be wrong.
5. I ask others to provide constructive criticism towards my ideas.
6. When solving a problem, I prefer to seek a second opinion from someone who has a different point of view from my own.
7. I use new information to reevaluate my existing viewpoints.
8. I learn a lot from people whose beliefs differ from mine.
9. Even when I am certain about my opinion, I research information to support the opposing viewpoint.
10. I feel that it is important to work through competing solutions to a problem.
11. I enjoy trying to make sense of conflicting information

## Appendix H

### Tolerance Scale

Instructions: A number of statements which people have used to describe themselves in general are given below. Read each statement and then select the appropriate answer option to indicate your level of agreement. There are no right or wrong answers. (5-point Likert)

1. I am open to change
2. I believe in equality between all races
3. I understand people who think differently
4. I try to forgive and forget
5. I sympathize with the homeless
6. I hold a grudge
7. I find it hard to forgive others
8. I don't like the idea of change
9. I believe in an eye for an eye

## Appendix I

### Situated Wise Reasoning Scale

In this section we would like you to think about a difficult situation that has happened to you with another person, specifically in your workplace (e.g., a disagreement, conflict) / specifically with a close friend. This should be a situation that you yourself were involved in, whether or not you were the person who initiated the situation. We would like you to take a moment to recall the situation and visualize the events in your mind's eye; consider who was involved and what happened, what you thought and how you felt. After doing so, please respond to the following questions:

1. When did this situation first begin?

- i. This week
- ii. Within the last month
- iii. Within the last 6 months
- iv. Within the last year
- v. Over a year ago

2. What day of the week was it?

- i. M
- ii. T
- iii. W
- iv. T
- v. F

vi. S

vii. S

viii. Don't remember

3. What time of day was it?

i. Morning

ii. Afternoon

iii. Evening

iv. Don't remember

4. What were you doing when it happened? This only needs to be a sentence or two.

i. {text box}

5. Where were you?

i. {text box}

6. Who was involved in this situation? Check any/all that apply – you may select more than one for any person: a coworker may also be a friend.

i. Boss, supervisor, or manager

ii. Mentor

iii. Trainer

iv. Colleague or Coworker

v. Subordinate

- vi. Mentee
- vii. Trainee or Apprentice
- viii. Customer or Client
- ix. Supplier
- x. Friend
- xi. Family

7. Was the person the same gender as you?

- i. Yes
- ii. No

8. Was the person the same race or ethnicity as you?

- i. Yes
- ii. No
- iii. I'm not sure

9. As you were thinking about this situation, what thoughts came to your mind? Please write your thoughts in the space provided.

- i. {text box}

Please continue to think about the situation you called to mind in the previous section and recall

the extent to which you engaged in the following thoughts and behaviors – what you actually did

as the situation unfolded. None of the statements listed below are supposed to be "good"

or

"bad". We are simply interested in how people approach difficult situations. Therefore, it is very

important to us that you answer as accurately as possible - your honesty is appreciated, and your

replies are, of course, anonymous.

"While this situation was unfolding, I did the following..." (from 1 – not at all, to 5 – very much)

1. Put myself in the other person's shoes
2. Tried to communicate with the other person what we might have in common
3. Made an effort to take the other person's perspective
4. Took time to get the other person's opinions on the matter before coming to a conclusion
5. Looked for different solutions as the situation evolved
6. Considered alternative solutions as the situation evolved
7. Believed the situation could lead to a number of different outcomes
8. Thought the situation could unfold in many different ways
9. Double-checked whether my opinion on the situation might be incorrect

10. Double-checked whether the other person's opinions might be correct
11. Looked for any extraordinary circumstances before forming my opinion
12. Behaved as if there may be some information to which I did not have access
13. Tried my best to find a way to accommodate both of us
14. Though it may not have been possible, I searched for a solution that could result in both of us being satisfied
15. Considered first whether a compromise was possible in resolving the situation
16. Viewed it as very important that we resolve the situation
17. Tried to anticipate how the conflict might be resolved
18. Wondered what I would think if I was somebody else watching the situation
19. Tried to see the conflict from the point of view of an uninvolved person
20. Asked myself what other people might think or feel if they were watching the conflict
21. Thought about whether an outside person might have a different opinion from mine about the situation

**Appendix J**

## Flourishing Scale

Below are 8 statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

\_\_\_\_ I lead a purposeful and meaningful life

\_\_\_\_ My social relationships are supportive and rewarding

\_\_\_\_ I am engaged and interested in my daily activities

\_\_\_\_ I actively contribute to the happiness and well-being of others

\_\_\_\_ I am competent and capable in the activities that are important to me

\_\_\_\_ I am a good person and live a good life

\_\_\_\_ I am optimistic about my future

\_\_\_\_ People respect me

## **Appendix K**

### **Example prospective writing responses**

Please note that all spelling, grammatical and typographical errors are from the original responses.

Coded yes for IH content and yes for prospection:

One time this week my friend and I were discussing gun control and we each had very different views on the issue. However, I was very interested in learning about their point of view and I was actually able to find out a lot of facts and interesting points from the conversation and it definitely led me to shift my own view on gun control a little bit. On a different occasion, in one of my economics classes, the lecture topic was on the economics of immigration and I had another instance in which I was intellectually humble. Once again, after hearing some of the facts about early immigration policy and trends and then learning about some of the statistics and trends of modern immigration I was able to gain a new perspective regarding effective immigration policy and immigration in general. I think moving forward, the most important self-practice I can have to continue to be intellectually humble is to not be overly-passionate or too assertive in support of my own beliefs. Instead, I need to have an open mind and be aware that different perspectives and viewpoints can help improve and strengthen my own perspectives.

Coded yes for IH content and no for prospection:

This week I used intellectual humility when discussing social networks and if they should be regulated and the political bias, if any within them. I disagreed with a friend that

facebook should be regulated. I am a big advocate of the free market and less government regulation this student wasn't. I used intellectual humility to hear her out and her position. I listened to her side and the evidence she had. She also used intellectually humility to listen to me. Using intellectual humility in this situation opened my mind to a way of think that I have never thought about. It turns out that I agree with her on some of her points and she agrees with me on a some of mine. At first we were on the complete opposite ends of the spectrum, but at the end of the conversation we were closer to the middle thanks to intellectual humility.

Coded no for IH content and yes for prospection:

I was intellectually humble this week with my roommate, she is a true Trump supporter which I am not. She was talking about how great his opinions are which I really do not agree with. I told her I was against him and that I didn't want to talk about it. I could have told her my real thoughts about him but that may have caused a heated argument so I am glad that I did not. I could be more intellectually humble this coming week by allowing the other person in the conversation to talk. Sometimes I interrupt them when I want to speak which may come off as rude or that I think my point is more important then theirs.

Coded no for IH and no for prospection:

As anyone with common sense and some sort or reason would be, I am an avid Atheist and when I hear people talk about their religious beliefs I do not interject with my opinion on the matter. These people believe, without any evidence of any sort, literally none, that some supernatural being exsits that controls our lives. Ludicrous really.

Thousands of religions around the world claim to be correct, how could they be? Science is measurable and reliable, where as religion is a waste of time used to give people hope and purpose from a made up fairy tale. When I hear talk about religion all of these thoughts come to my mind and I do not say anything. Especially around Easter. People believe a man rose from the dead. Its actually funny people believe this really happened. Religion grinds my gears everyday. It calls for the slaughter of innocent human beings and the cause of war across the world, all supposedly in the name of a god. Bullshit. Time after time religion conforms to out scienfic advancements, never the other way around. Humble may not be the right word to describe how I feel in these circumstances when I say nothing. I honestly feel bad. But I know their ignorance to facts and emperical evidence had been burned into the minds of many before they can even think for their own. I feel superior to those who take fairy tales and storys as factual truths.

## **Appendix L.**

### **Example self-distancing writing responses**

Please note that all spelling, grammatical and typographical errors are from the original responses.

Coded yes for unbiased IH content and yes for future suggestions:

An unbiased individual might say that an intellectually humble action may have been something small, such as reviewing a counterproposal made against a certain suggestion to play a game or get food, or they may have noticed more obvious instances such as absorbing the opinion of a classmate or professor and changing a certain opinion of my own because of the new knowledge or insight that their thoughts have presented to me. However, all of these events that occurred over the past week might still not satisfy the criteria of being intellectually humble and if even if they do, an unbiased person may say that there is more to be done in order to accomplish this. Such examples would be to interact more with individuals who have opposing viewpoints from my own. This would be a good genesis for conversation that leads to intellectually stimulating ideas and a dichotomy to exchange important opinions on social, economic, political and international affairs and issues. They might also suggest asking more questions and bringing certain topics to light that are often left in the dark because portions of society may consider them to be too vulgar, dark, or "taboo", such as sexual assault, human trafficking etc. In the same regard, to be intellectually humble does not necessarily mean that one must only do so when it involves issues sensitive to others or society as a whole. It means that one must also do so in settings where things more trivial or more occupationally-related are discussed such as math, science, literature, etc.

Coded yes for unbiased IH content and no for future suggestions:

Over the weekend, my friend took me to a church that was not my religious sect. Instead of judging their concepts, traditions, and rituals, I learned and listened to it without condescending or narrow-mindedness. I realize that this helped me learn other people's backgrounds and their opinions. I think it is good to allow yourself to not judge people and accept for their sake but also your sake as well.

Coded no for unbiased IH content and yes for future suggestions:

My last week has been a week full of stress, but also reward. I have worked hard at school, and I have felt rewarded for how I felt after how I performed on my tests and lab reports. However, over the last week there has been several people like my parents and friends concerning about my stress and sleep. Instead, of accepting their worry and help, I more ignored them and complained about school. I was selfish and took their concern and help for granted. An unbiased observer would have probably thought I was a self-minded individual only concerned with my problems. I was not the only student with a lot of work that week. In addition, I often feel like I am a bit self-centered and only think about myself in an egotistical matter. The unbiased observer might suggest listening to the ideas and thoughts of others and using those ideas to enhance mine, rather than me rejecting them because I am so positive my ideas are only correct. It is a good thing to be humble because people respect people those who do not brag and open to new thoughts, in order to enhance their learned knowledge.

Coded no for unbiased IH content and no for future suggestions:

I have been humble because I don't brag about anything. I am a calm person and have been relaxing as the semester winded down. I haven't been at all boastful. I may see when some people are wrong but I don't tell them so. I just wait until they realize they are wrong or someone tells them even when I know the correct answer. This is humility because I knew they were wrong but I didn't say anything about it. I just don't acknowledge people.

## CURRICULUM VITAE

**CORINNE E. ZACHRY**

### EDUCATION

- OHIO UNIVERSITY HONORS TUTORIAL COLLEGE** Athens, OH  
*Bachelor of Fine Arts in Theatre* 09/2009 – 09/2013
- Graduated with honors
- CALIFORNIA STATE UNIVERSITY – LOS ANGELES** Los Angeles, CA  
*Non-degree seeking student in Psychology* 06/2015 - 08/2015
- MIAMI UNIVERSITY** Oxford, OH  
*Non-degree seeking student in Psychology* 08/2015 - 05/2016
- WAKE FOREST UNIVERSITY** Winston-Salem, NC  
*Master of Arts in Psychology* Expected 05/2018  
 Advisor: Dr. Eranda Jayawickreme

### RESEARCH EXPERIENCE

- WAKE FOREST UNIVERSITY GROWTH INITIATIVE LAB** Winston-Salem, NC  
 08/2016 – Present  
*Graduate Student Researcher*
- Primary Investigator: Dr. Eranda Jayawickreme**
- Managing and scheduling the involvement of a team of undergraduate research assistants
  - Serving as co-Primary Investigator on research concerned with measuring and promoting intellectual humility
  - Attending weekly lab meetings to discuss scholarly research literature, and presenting research relevant to intellectual humility, wisdom and posttraumatic growth
  - Adapting and responding to varied additional lab needs, including roles in study design, Institutional Review Board applications, project management and participant recruitment

**WAKE FOREST UNIVERSITY CENTER FOR  
GLOBAL PROGRAMS & STUDIES**

Winston-Salem, NC  
08/2016 – Present

*Graduate Research Assistant*

**Primary Investigator: Dr. Nelson Brunsting**

- Developing and administering direct and indirect program assessments as a part of the Quality Enhancement Plan (QEP) Assessment team
- Compiling and analyzing research literature related to QEP initiatives, which have been designed with the goal of building a global campus community
- Serving as graduate student co-Primary Investigator on Global Intercultural Research Team, providing guidance to students on research projects pertaining to the socio-emotional experiences of international students studying at U.S. universities
- Adapting and responding to varied additional research team needs, including roles in study design, class instruction, Institutional Review Board applications, participant recruitment and project management

**MIAMI UNIVERSITY SOCIAL MOTIVES LAB**

Oxford, OH  
08/2015 – 06/2016

*Research Assistant*

**Primary Investigator: Dr. Jonathan Kunstman**

- Scheduling and administration of computer-based studies to student participants, in addition to collecting data and results for those studies
- Attending biweekly lab meetings to discuss scholarly research literature on topics regarding social motives, and presented published findings in the field of social psychology, intergroup processes and prejudice research to the group
- Adapting and responding to varied additional lab needs, including roles in study design, organization, implementation and direct communication with participants

**PUBLICATIONS**

**Zachry, C. E.,** Phan, L. V., Blackie, L. E. R., & Jayawickreme, E. (2018). Situation-based contingencies underlying wisdom-content manifestations: Examining intellectual humility in daily life. *The Journals of Gerontology: Series B*.  
<http://dx.doi.org/10.1093/geronb/gby016>

Jayawickreme, E., Jayawickreme, N., **Zachry, C. E.,** & Goonasekera, M. (2018). The importance of positive need fulfillment: Evidence from a sample of war-affected Sri Lankans. *American Journal of Orthopsychiatry*.  
<http://dx.doi.org/10.1037/ort0000300>

Jayawickreme, E., & **Zachry, C. E.** (in press). Positive personality change following adversity. In V. Zeigler-Hill & T. Shackelford (Eds.), *The SAGE Handbook of Personality and Individual Differences*.

Brunsting, N. C., Smith, A. C., & **Zachry, C. E.** (in press). Academic and cultural transition course for first-year international students in US universities: Efficacy and outcomes. *Journal of the First-Year Experience and Students in Transition*.

Jayawickreme, E., & **Zachry, C. E.** (submitted). Traits and dynamic processes. For inclusion in P. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology*.

### **MANUSCRIPTS IN REVISION**

Brunsting, N. C., **Zachry, C. E.**, & Takeuchi, R. (in revision). Undergraduate international student socio-emotional adjustment at US universities: A systematic review from 2009-2017.

Brunsting, N. C., **Zachry, C. E.**, Liu, J., Bryant, R., Wu, S., Fang, X., Luo, Z., & Fan, H. (in revision). Social support and belongingness: Which factor is more critical for international student well-being at US universities?

### **WORKS IN PREPARATION**

Brunsting, N. C., & **Zachry, C. E.** (2018). Adapted measures for a global mindset: Intercultural inquiry and global responsibility. *Manuscript in preparation*.

### **PRESENTATIONS**

**Zachry, C. E.** (2017, May). *Examining intellectual humility in daily life: An experience-sampling assessment*. A paper presented at Humility: 6<sup>th</sup> annual Biola University CCT Academic Conference, La Mirada, CA.

Brunsting, N. C., Smart, J. W., & **Zachry, C. E.** (2017, February). *Efforts to enhance international students' intercultural competence*. A paper presented at the 9<sup>th</sup> Annual Meeting of the Workshop on Intercultural Skills Enhancement, Winston-Salem, NC.

### **SELECTED ADDITIONAL EXPERIENCE**

#### **WORLD RELIEF**

*Volunteer*

Winston-Salem, NC

08/2017 – Present

- Providing administrative support to the Winston-Salem refugee resettlement and anti-human trafficking teams.
- Assisting with the launch of a sewing education program for refugee clients to increase preparedness for job opportunities.

- Assisting with other projects as needed, including locating community mental health organizations for potential partnerships and client referrals, and compiling language information to assist staff in communication with clients.

### **LOS ANGELES OPERA**

*Costume Crafts Assistant*

Los Angeles, CA

07/2013-07/2015

- Creating costume accessories and fitting them on performers.
- Collaboration with costume designers and other artisans in order to achieve the production's intended goals.
- Communicating and working with many different types of people. Collaborations often involved creative problem solving as well as quick-thinking and adherence to strict production schedules and deadlines.

### **GRANTS, HONORS AND SCHOLARSHIPS**

<b>2017</b>	<b>WAKE FOREST UNIVERSITY SUMMER RESEARCH FUNDING</b>
<b>2016-2018</b>	<b>WAKE FOREST DEPT. OF PSYCHOLOGY GRADUATE STUDENT SCHOLARSHIP</b>
<b>2012</b>	<b>OHIO UNIVERSITY PROVOST'S UNDERGRADUATE RESEARCH FUNDING</b>
<b>2011</b>	<b>HONORS TUTORIAL COLLEGE DEAN'S DISCRETIONARY FUNDING</b>
<b>2009-2013</b>	<b>OHIO UNIVERSITY GATEWAY EXCELLENCE SCHOLARSHIP</b>
<b>2009-2013</b>	<b>HONORS TUTORIAL COLLEGE DEAN'S LIST</b>

### **ADDITIONAL SKILLS AND TRAINING**

#### **TECHNOLOGY:**

- Mac and PC
- Microsoft Office: Word, Excel, PowerPoint
- Google Suite: Drive, Sheets, Slides, Forms
- Webpage creation and maintenance (e.g. Wix, Squarespace).

#### **STATISTICAL SOFTWARE AND ANALYSES:**

- MPlus
- SPSS
- AMOS
- R

**RESEARCH METHODS:**

- Knowledge of survey design software (e.g., Qualtrics, Google forms)
- Use of online research management systems (e.g., Sona Systems)
- Experience Sampling Methodology/Ecological Momentary Assessment
- Exploratory/Confirmatory Factor Analysis
- Psychometrics
- Qualitative interviewing
- Systematic literature review