THESIS

AN ANTIDOTE TO FEAR: EXPLORING DEATH REFLECTION AS A PREDICTOR OF PRO-SOCIAL VALUES

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ABSTRACT

AN ANTIDOTE TO FEAR: EXPLORING DEATH REFLECTION AS A PREDICTOR OF PRO-SOCIAL VALUES

In over three decades of terror management theory (TMT) research, results have continuously pointed towards one grave lesson: that unchecked fear of death can lead to terrible outcomes both for the self and for the world at large. TMT research has connected mortality salience (MS) manipulations (reminding one of their mortality) to increases in greed, racism, political extremism and a host of other negative outcomes (Greenberg, Schimel, Martens, Solomon, & Pyszcznyski, 2001; Hirschberger et al., 2016; Kasser & Sheldon, 2000). While negative outcomes have been thoroughly outlined in the research, less attention has been given to investigating ways to ameliorate these problematic effects and to reveal healthier, more productive ways to engage with our mortality. The death reflection (DR) manipulation—in which participants actively imagine their simulated death and engage in reflection and perspective taking—has shown promise in bridging this gap (Cozzolino et al., 2004). The research on this manipulation and corresponding theory is at this juncture minimal, and further development is needed. Study 1 sought to replicate Cozzolino et al's findings from their (2004) study, where DR was found to produce significantly less greedy behavior when compared to MS. This study was not able to find significant effects, despite having a larger sample than the original study. The findings of this study generate questions about the effects of MS and DR manipulations, which are explored in detail. Study 2 sought to test for changes in values from the DR manipulation through a new Emergent Values Measure (EVM) protocol that used free listing

and sorting methodologies. This study was unable to demonstrate a strong statistical relationship between that measure and the Aspirations Index (AI), which impeded further comparison and analysis. The data for these studies is explored, and implications for future research are detailed.

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CHAPTER 1: INTRODUCTION

Becker and the Problem of Death

Contending with the nature of death is a challenge to the discursive intellect of humankind. Our experience of consciousness seems to suggest that we have always been here, and always will be, yet we are faced with daily reminders that life is fragile and ultimately finite. Ernest Becker, in his seminal work, *The Denial of Death*, understood it as the most natural temptation for human beings to seek a life free from fear of annihilation. For Becker, freedom from this fear entailed not only avoiding actual encounters with death, but also countering the small subtle reminders of our ultimate mortal nature that we experience daily. Becker was an early voice in suggesting that this obfuscation was not harmless, and in fact, could be the very origin of much of the evil in this world (Becker, 1973, 1975).

According to Becker, appreciation must be given to the functional role of fear of death. We possess fear of death primarily as a means of self-preservation. Those that have stood near the edge of a cliff or have had a close encounter with a bear could readily defend the utility of this fear in keeping one alive. When we fear death, we do our best to mitigate the threats provoking this fear and hence, in the best of circumstances, can be spared from the ultimate end. Fear of death is thus a powerful and essential force for life; without it, ironically, we would be more likely to die sooner (Becker, 1973).

Humans have the ability to conceptualize the future, hence this places fear of death not just in circumstances where death is imminent (e.g. the bear previously mentioned), but as a constantly present force. By virtue of our intellect and our experience knowing others who have died, we know that someday we will die, and this evokes terror. Fear of death must be controlled

in order to limit arousal to thematically appropriate circumstances. If we felt our fear of death at all times, it would be immensely difficult to live a productive and fulfilling life (Becker, 1973).

Culture is the means by which we make sense of our world and organize our communities, but to what ends are these constructions created? Becker saw culture in light of the problem of fear of death. He proposed that culture, at its most basic level, serves the function of mitigating death anxiety. Becker postulated that we manage our fear by countering death with "symbolic immortality," sought through cultural forms. As a cultural anthropologist, Becker was attuned to the importance of symbolic structures to humankind, and the uniqueness of these tools to our species. He saw in the stories and rituals of cultures across the world an enduring narrative of heroism, where the good, just, and vital persist, prevail and are remembered beyond their lifetimes. For Becker, this transcendence of self, enabled by culture, pointed towards the utility of culture in assuaging death fears (Becker, 1971, 1973).

Terror Management Theory

Terror management theory (TMT) seeks to more specifically define, operationalize and empirically test the relationship between death denial, culture, and human behavior postulated by Becker. In a foundational paper (Solomon et al., 1991), it was proposed that culture offers a blueprint of what its members must do to be considered important and of value in their world vis-a-vis ethical standards, hierarchies of achievement, etc. It was also argued that culture can offer its members a sort of "immortality," whether by spiritual means (e.g. an afterlife, heaven, etc.), or by way of legacy (esteemed members of a culture are celebrated and memorialized long after their deaths) (Solomon et al., 1991).

Since internalized cultural values provide a metric of an individual's value, TMT postulates that these values serve as an important basis of self-esteem. When one lives up to

these internalized values, one feels good, important and vital. Conversely, the thought of death makes one feel limited, insignificant and anxious. In this manner, fear of death is imagined as being directly in opposition to self-esteem. Put simply, the fear of annihilation is countered with self-aggrandizement; TMT proposes that this battle is constantly being waged within us (Solomon et al., 1991).

TMT reimagines our internalized cultural values as a "cultural anxiety buffer" to highlight their function in minimizing distress from attacks on the self. The theory proposes that when fear of death is invoked, the importance of one's cultural values increases in accordance with their anxiety reducing function. This was demonstrated in an early experiment (Rosenblatt et al., 1989) where participants set the bail bond for a hypothetical prostitute. It was found that in the mortality salience (MS) condition, participants set the bond rate tremendously higher (M = \$455) than in the control (M = \$50). Explained within the TMT framework, reminders of death prompted participants to feel a greater need to champion the internalized values of what their culture views as morally correct. Since the prostitute's behavior was considered reprehensible by most participants' cultural standards, presumably an imperative to enact harsher punishment was felt in order to vindicate the importance of these standards. It is important to note the dual purpose of this action: not only was the prostitute being punished for failing to meet cultural standards, but simultaneously the punishers highlighted their own adherence to these standards, thus bolstering self-esteem and lessening death anxiety.

Since its introduction over three decades ago (Greenberg et al., 1986), TMT has been empirically tested in hundreds of studies. The typical TMT experiment involves a mortality salience (MS) manipulation: a prompt intended to invoke awareness of the inevitability of death. One of the first and most common MS manipulations is the Mortality Attitudes Personality

Survey (Rosenblatt et al., 1989) which asks participants to answer two open-ended questions regarding what will happen to them physically when they die, and the thoughts and feelings death evokes in them. Since the mechanism of TMT is not thought to be consciously enacted, it has been suggested, following research, that a delay task be employed after the manipulation in order to let thoughts of death fall just beyond consciousness (Greenberg et al., 1994). Distraction measures have included filler surveys or measures such as the Positive and Negative Affect Schedule (Burgin, 2010; Pyszczynski & Kesebir, 2011; Watson et al., 1988), or an unrelated word search (Schimel et al., 1999). After the delay task, an outcome measure is employed to test MS behavior against controls.

Becker proposed that in defense of our fear of death, humans are capable of considerable harm and evil (Becker, 1975). While some behaviors evoked by MS (e.g. in the aforementioned experiment with the prostitute) may seem of limited ethical consequence to some people, other outcomes are less nuanced. What occurs when internalized values are not productive or pro-social? What happens when internalized values come into conflict with other cultures and sub-cultures?

To acknowledge the import of TMT, it must be observed that the values of many cultures are not compatible with those of other cultures. In many cases, the interests of one group are directly in contradiction to the interests of another, and to preserve consonance with our own culture, we might endorse conflict. Such an opposition was investigated in a study that recruited participants from South Korea and Israel, two nations with long-standing conflicts with neighboring nations (North Korea and Palestine, respectively) (Hirschberger et al., 2016). It was found that MS increased support for attacks against the "adversarial" nation, even when the military action would have little strategic value. The punishment of the enemy was viewed as a

righteous end in and of itself, regardless of the consequences. To bring the study into the parlance of TMT, reminders of death heightened the importance of participants' belonging to their own culture and justified the punishment of those outside of it. Interestingly, it was found that these results replicated when using a reminder of a past conflict in place of the traditional MS manipulation. This experiment speaks to the generalizability of the MS manipulation; there are real-life analogues that elicit fear of death and corresponding defensive behaviors.

In the context of North America's capitalist society, wealth is associated with achievement, status and importance; hence, to the degree that this value is internalized, it can potentially be used as a tool to build one's self-esteem within the TMT framework. Research has supported this hypothesis; one study observed that participants in an MS condition had higher future financial expectations for themselves and also consumed significantly more resources in a forestry-management game compared to the control condition (Kasser & Sheldon, 2000). In another study, participants in an MS condition, relative to controls, rated luxury items as significantly more desirable (Mandel & Heine, 1999). These studies, interpreted in the TMT framework, suggest that when people are reminded of their mortality, the self-esteem boosting properties of consumption and status become more important, hence, the significance of luxury goods becomes more salient (Mandel & Heine, 1999), as does the desire to increase personal wealth (Kasser & Sheldon, 2000). Living in times where the environmental, social, and personal consequences of over-consumption are becoming ever more evident, mitigating the role of death fear in these behaviors appears as an imperative (Alfredsson, 2004).

TMT has been implicated in many other socially troubling behaviors including: racism (Greenberg et al., 2001), callousness towards animals (Lifshin et al., 2017), outgroup derogation (Greenberg et al., 1990), conflicts between spiritual groups (Cook et al., 2015), stereotypic

thinking about nationality and race (Schimel et al., 1999), and reckless driving (Taubman, 2000). Furthermore, studies have found negative self-related consequences related to death denial, such as increases in risky sexual behavior (Taubman-Ben-Ari, 2004), and significantly lower scores on a scale of "positive components of the self" comprised of self-concept clarity, locus of control, self-esteem, self-realization, and existential well-being (Cozzolino et al., 2014).

There is some research suggesting that MS does not always lead to negative or socially undesirable behaviors. One study found that those in an MS condition were more generous compared to controls when asked to split a limited amount of money between themselves and another student (Zaleskiewicz et al., 2015); additionally, these participants were more satisfied with the money they gave to the other student. At first glance, this result seems a blatant contradiction of the greed observed in Kasser and Sheldon's study (2000), and here resides some important nuance in the TMT literature. When we consider that certain prosocial behaviors are culturally endorsed (e.g. generosity to one's immediate peers in this example), it makes sense that these behaviors could also serve an anxiety reducing function within the TMT framework. Reminders of death may not always lead to greedy behavior in instances where generosity reifies an important value. Another study found that MS manipulations led participants to donate less money to foreign charities in comparison to a control group (Jonas et al., 2013). Generosity to people outside of one's culture is not likely to serve the same cultural anxiety buffer function, hence in this example greed prevails. Immediacy and cultural relevancy seem to be key factors in moderating greedy behavior within the TMT framework.

In a meta-analysis of 277 experiments conducted internationally (Burke et al., 2010), MS was found to have a mean effect of $r = .35$, providing robust support for the mechanisms proposed by TMT. Given the negative outcomes associated with MS and the considerable

empirical support for TMT, the imperative for researchers seems clear: TMT has illuminated what could be described as a cancer in our culture, and a treatment is badly needed.

Death's Positive Side

As Wong and Tomer (2011) note, we are surrounded more than ever by reminders of death in our world of 24-hour news coverage. We hear daily of shootings, wars, natural disasters, etc. that make the imminence of death salient. Given what we know of TMT, the saturation of these death reminders proves concerning, but Wong and Tomer offer their acknowledgement of these circumstances with a gesture of hope that redemption can be found in acceptance of our mortality.

While the abstract concept of death is terrifying, deference must be given to the multifarious ways in which death serves positive roles. When viewed from an ecological perspective, death can be seen as a precondition for life in that death, quite literally, feeds life. As consumers, largely distanced from the means of production and purchasing our food processed and packaged, it can be easily overlooked that our very food was once living, regardless of whether we are a vegetarian or an omnivore. If other creatures and plants were not to die in the service of our sustenance, we would not live.

In connection to this, if human beings did not die, there are the practical considerations of overpopulation to contend with. There is simply a limit to how much life can be supported at once. Careful study of the natural world yields an understanding of this delicate balance: a tree is struck by lightning but gives birth to mushrooms and provides shelter and food for insects. These facts should be considered not only to temper our illusions of immortality, but because they give death purpose and value beyond ourselves. If the value of death can be grasped, maybe the terror of its immanency can be assuaged.

Attention must also be paid to the phenomenological impact of death on how a life is lived. If we were immortal, what value would our time have? How significant would our relationships seem? Perhaps it is the very shortness of life and the uncertainty of its exact length that make it so ripe with meaning (Becker, 1973; Wong, 2008). This aphoristic wisdom finds support in the research on post-traumatic growth (PTG) and near-death experience (NDE).

Near Death Experience and Post-Traumatic Growth

The experience of death awareness elicited in TMT experiments is quick, abstract, and provides a somewhat open opportunity for how one wants to engage with it. Conversely, the real-life traumatic experiences detailed in the post-traumatic growth (PTG) and near death experience (NDE) literature tend to be uncontrollable and manifest themselves over time, either because the traumatic experience is long in form (e.g. living in a war zone), or because the poignancy of the traumatic experience persists (Lykins et al., 2007). To illustrate, consider someone who is diagnosed with cancer and given 6 months to live, only to have the disease go into remission. This experience of death consciously highlights one's ultimate lack of control, whereas in TMT the illusion of control can be maintained. These are qualitatively distinct experiences of death. Calhoun and Tedeschi (2010) note three domains of change in those with PTG: perception of self, relationships, and life goals, with each of these changes generally valanced in a positive direction. With acknowledgement of the limited nature of the self, PTG encourages greater interpersonal attachment, increased emotional fluency, spiritual development and a greater concern for and preoccupation with others. In general, the changes seem to point towards a simple and global dynamic: a lessened importance of the self, and a heightened importance of others and the world (Calhoun & Tedeschi, 2010).

NDE's represent a particularly potent form of PTG, especially in light of the research of which is this paper's interest, since the traumatic experience is explicitly a close brush with death. Greyson (1997) notes that the value changes in near death experiencers (NDErs) are often so profound that it creates significant conflict with their social world. Where once NDErs' values were concordant with those of their spouse, friends and community, the changes in value structure following an NDE create significant dissonance. This conflict should perhaps be interpreted as one between those still living in ignorance of death and one who has experienced and accepted death. Although Greyson acknowledges considerable social difficulties in NDErs, he seems to imply that the positive pro-social changes experienced after NDE seem to more highlight a poverty in the perspective of those who have not had an NDE, than issues with the NDEr's new point of view. To put it succinctly, the NDEr struggles to integrate death into a world bent on denying death's existence. The positive changes seen in the NDR and PTG literature, however, make a compelling case for the necessity of integrating mortality appreciation into general awareness.

Death Reflection

Emerging from the literature on PTG and NDE is a newer paradigm called "death reflection" (DR) (Cozzolino et al., 2004). The DR manipulation is intended to invoke the qualities of a near death experience which include both the death experience, and an evaluative and reflective process. The death experience is attained via participants reading an in-depth narrative that portrays them perishing in an apartment fire (Appendix A). The slow nature of the narrative allows participants to immerse themselves in the experience and provides a realistic space where life reflection can occur. Following the narrative, participants answer open-ended questions meant to instigate this reflective process, so that participants' lives are contextualized

in light of the reality of death (Appendix B). Qualitative research (Hunter, 2012) has demonstrated DR's ability to engage participants on the three key components of a near death experience: an encounter with death, a review of the life that has been lived, and integration of new perspectives (Ring, 1984). This suggests that similar content is evoked in the DR manipulation and in NDE's. In theory, this engagement should bring about some measurable changes in participants in alignment with what has been demonstrated in the NDE research: mainly, an increase in pro-social behavior.

To contextualize the importance of DR in the TMT literature, recall that TMT proposes that humans are generally acting under the pretense of immortality. If this assertion is true, then it can be understood that experiences with actual death likely shatter the power of that artifice. Encountering the concrete knowledge that one will die re-contextualizes all of the thoughts, beliefs and values formed under the pretense of immortality. Hence, profound shifts in values may be enabled.

Previous research on MS and greed (Kasser & Sheldon, 2000) established that for those holding extrinsic value orientations (which privilege worldly success and wealth), greed was increased in MS conditions. Recall that within the framework of TMT, when threatened by thoughts of death, individuals are driven to reinforce their internalized belief structures about what is valuable and meaningful in their lives. This is why those with extrinsic goal orientations react with increased greed, while those without such an orientation do not. If the DR manipulation is capable of inciting value reevaluation, then it ought to have a differing outcome when compared to MS manipulations.

This is exactly what the first DR study found (Cozzolino et al., 2004). To test this hypothesis, Kasser and Sheldon's study (2000) was modified with an added DR condition and a

different outcome measure for greed. At the end of the study, participants were offered a chance to win a $100 gift certificate in a raffle. Participants were given an envelope with 20 raffle tickets and were told to take as many as they deemed fair with the understanding that all future participants would be selecting from the same pool of tickets. For those with high extrinsic value orientation, there was a significant reduction in tickets taken in the DR condition compared to the MS condition (β = -.49, p < .05); these typically greedy individuals became slightly less greedy. This result supports the potential for DR to invoke value changes in a positive pro-social direction.

The promise of DR is significant if it is able to counter other negative effects observed in MS experiments. Limited other studies have been completed, and findings have been somewhat mixed amongst different authors. In another study the DR manipulation was tested against MS in relation to individuals' intentions to donate blood (Blackie & Cozzolino, 2011). In a TMT perspective, reminders of death should generally reduce intentions to donate blood, as blood is a reminder of creatureliness (self as animal), and hence heightens an already aroused fear of death (Goldenberg et al., 2001). However, MS was found to increase intentions to donate blood when there was high need. TMT would suggest that in the high need condition, the internalized requirements of what it means to be a "good person" in one's culture would be invoked, and hence blood donation could serve an anxiety buffer role (self as valued citizen) instead of as a mere reminder of mortality (self as animal). Comparatively, in the DR condition high and low need made little difference in the intention to donate blood, and both rates were still higher than in the MS condition. While the prosocial effects of MS in the high need condition are provocative, they must be seen in context. In order for prosocial action to occur in MS, it must relate to the culture and community that the individual values and has internalized. Recall that,

in a previous study, those in MS conditions donated less money to foreign charities than their control counterparts (Jonas et al., 2013). Such pro-social behavior under MS is narrow and restricted, whereas the effects of DR appear to promote pro-social behavior regardless of mitigating contextual factors.

Hunter (2012) performed one of the few studies on DR by an independent researcher. Hunter's study qualitatively analyzed participant responses to determine if the DR manipulation was soliciting the intended level of engagement. Hunter found that, while a significant minority appeared to be unengaged or else involved in death denying thinking, the majority of participants seemed to take the prompt seriously and reflected mostly on relationships and the value of life. This research suggested that the DR manipulation was effective overall, but that some measurement error may arise as a consequence of lack of engagement. Hunter also suggested that some individuals who are engaged in death denial thinking may actually process the DR manipulation as MS, which could cause considerable distortion in outcomes. This, however, was noted to be the minority of participants.

Hunter found no significant differences between the control group and DR group on a wide variety of outcome measures, including measurements of extrinsic and intrinsic value orientation (EVO and IVO, respectively). One limitation of this study's design is that it did not establish a baseline measure of values from which to calculate change; rather, it merely compared differences in group means post-manipulation. This could mean that pre-manipulation group differences could be masking some of the effect of the DR manipulation. This is unlikely, given that no other variables showed significant differences between groups, but is still possible. Hunter argued that while the DR manipulation offers an interesting, and in many ways, profound experience, the strength of its impact may be limited by its obvious artificiality (2012).

A few extant studies illustrate the promise of DR, but the literature is still in a nascent stage. Further support for the DR manipulation is needed by independent researchers, as well as comparisons with MS across the expanse of TMT literature. While a few early studies have been promising, future research should seek to find just how effective DR is at mitigating negative MS outcomes. Will DR be a universal antidote to MS, or will its effectiveness be restricted to specific contexts? Does DR invoke value changes, however brief? Further investigation is needed.

Proposed Research

Given the persistently negative outcomes detailed in the TMT literature, the consequences of denying our mortality appear dire. What arises out of the literature is a composite portrait of the problem Becker laid out in his works, which pits a portion of the etiology of "evil" on ineffective adaptation to our basic existential condition (Becker, 1975).

The illumination of a problem, however, does little good unless ways to ameliorate it are explored. The research on DR provides a promising direction of one possible way that negative effects can be averted, through what is essentially acceptance of one's mortality, and a reappraisal of one's life in light of its end. At this juncture, the DR literature is still underdeveloped; the research in this paper sought to aid in the development of this promising direction through replication and extension of current findings.

The first proposed study sought to replicate one of the most significant early DR experiments, which compared the DR manipulation to TMT's MS manipulation (Cozzolino et al., 2004). Given the replication crisis in the social sciences (Earp & Trafimow, 2015; Shrout & Rodgers, 2018), skepticism is due towards new and promising findings, especially those which possess the weight and scope which DR exhibits. Given the widespread successful replication of

MS experiments, a case for DR in the positivist realm can only be made by equally scrupulous experimentation. An effective replication would serve to further bolster the DR hypothesis and further energize research in this domain.

Study 2 sought to evaluate if value changes occur under MS and DR manipulations. A mixed-method design was developed employing free listing, a popular tool from ethnographic research (Weller & Romney, 1988). Free listing is used when researchers want to define a specific semantic domain using participants' own language and understanding. Researchers prime participants with the domain of interest and ask them to exhaustively list all the words they associate with the domain. This method is of particular use when researching cultures where researchers have little contextual understanding of the local language and its meanings. By allowing participants to define the domain in their own terms, some corruption of data via the researchers' own bias can be avoided.

This study intended to create a measure of values using the free listing method, which is called the Emergent Values Measure (EVM). This measure was intended to capture participants most salient and important values immediately following administration of control, MS and DR manipulations. If meaningful comparisons could be made with participants' scores on the Aspiration Index (AI), another measure of values, changes in values could theoretically be observed.

Significance

If the death reflection experiment replicated, it would provide support for what could be a significant addition to the TMT literature. Researchers have spent enormous amounts of energy outlining the problem of death fear; DR could provide the necessary foundation from which to

explore solutions to this problem. The possible implications of an empirically supported DR framework are broad. A few hypothetical possibilities are explored next.

If contact with death followed by reflection are the active ingredients that mitigate MS, ways in which we treat death (and avoid contact with it) could be challenged (e.g. using euphemisms to speak of death, the distance at which the funeral industry allows us to encounter death, etc.). While these changes are broad and cultural in nature, and hence not easily invoked, a sound body of research could prove a catalyst for some meaningful change in these domains.

DR could also inform specific interventions intended to counteract the sorts of unsavory behaviors associated with TMT and to encourage prosocial behavior. Furthermore, DR could be used clinically to help promote the positive self-related consequences detailed by Cozzolino & Blackie (2014) (self-concept clarity, locus of control, self-esteem, self-realization, and existential well-being). Given the centrality of death to life, and the reach of the effects of TMT, the possibilities for positive change from DR appear quite broad.

Research Questions and Hypotheses

Study 1. The first questions concern replication of Cozzolino et al's 2004 study. Both questions circle around the theory that MS will generally result in greedier behavior, and DR in less greedy behavior. Greed was measured by the number of raffle tickets taken by participants (see chapter 2 methods section for full details).

- RQ1: Will the MS manipulation produce greedier behavior when compared to the control?
- RQ2: Will the DR manipulation produce less greedy behavior when compared to the MS manipulation?

In previous research, MS has been shown to increase selfish behavior, therefore:

- H1: The mean number of tickets taken will be higher in the MS condition relative to the control.

So far, DR has demonstrated a potential to increase pro-social behavior, therefore:

- H2: The mean number of tickets taken will be lower in the DR condition relative to MS.

The next two questions more specifically inquire about the interaction between individual differences in EVO, the manipulations, and their impact on greedy behavior.

- RQ3: Will the MS manipulation produce greedier behavior at higher levels of EVO when compared to the control?
- RQ4: Will the DR manipulation produce less greedy behavior at higher levels of EVO when compared to the MS manipulation?

Cozzolino et al's study (2004) as well as Kasser and Sheldon's (2000) found that at higher levels of EVO (EVO), people became greedier in the MS condition relative to control. Cozzolino et al. (2004) found that at higher levels of EVO, people became less greedy in the DR condition relative to MS.

- H3: At higher levels of EVO, people in the MS condition will take more tickets relative to control.
- H4: At higher levels of EVO, participants in the DR condition would take fewer tickets when compared to the MS condition.

Cozzolino et al (2004) specifically tested the impact of EVO at 1 standard deviation above and below the mean and found significant effects.

- H5: Participants whose EVO scores fall 1 standard deviation above the mean will take fewer tickets in the DR condition when compared to the MS condition.

The next set of questions mirror some of the content of the preceding four but investigate the role of PVO instead of EVO.

- RQ5: Will greater levels of PVO predict increases in greedy behavior?
- RQ6: Will the MS manipulation produce greater levels of greedy behavior at higher levels of PVO?
- RQ7: Will the DR manipulation produce less greedy behavior at higher levels of PVO?

One might expect that the more transcendently oriented someone is, the less interested they might be in earthly rewards.

- H6: Increases in PVO orientation will significantly predict an increase in the number of tickets taken in the control condition.

MS has been demonstrated to increase aversion to reminders of creatureliness (Goldenberg et al., 2001), and so for those more oriented to their body, there may be a stronger urge to engage in ego bolstering behaviors. In this instance, it is thought that greedy behavior might increase.

- H7: Higher levels of PVO will predict more tickets being taken in the MS condition when compared to the control.

The prompts of the DR manipulation encourage participants to think outside of themselves, and many participants have been shown to ponder the impact they had on others (Cozzolino et al., 2004). It seems as though this might invoke a shift toward a more transcendent value orientation for those who might otherwise be more physically oriented. A shift to transcendent values seems as though it might invoke less greed.

- H8: Those high in PVO will take fewer tickets in the DR condition when compared to the MS condition.

- H9: Those high in PVO will take fewer tickets in the DR condition when compared to the control.

Study 2. This study aims to detect the changes in values purported to take place in MS and DR manipulations by comparing scores on the AI to the Emergent Values Measure (EVM), an instrument developed through free listing and sorting tasks. Since the EVM is experimental in nature, questions about its predictive power must be first addressed.

- RQ8: Will the EVM's dimensions correlate strongly with the respective dimensions of the AI in the control condition?
- RQ9: Will the EVM's EVO and PVO scores correlate highly with the AI's in the control condition?

  It is anticipated that the respective dimensions will correlate positively and strongly.

- H10: The EVM's dimensions will correlate at or above $r = .5$, $p < .05$ with respective dimensions on the AI in the control condition.

  Likewise, it is anticipated that the index scores of EVO and PVO will bear similar results.

- H11: The EVO scores on the EVM will correlate at or above $r = .5$, $p < .05$ with respective scores on the AI.
- H12: The PVO scores on the EVM will correlate at or above $r = .5$, $p < .05$ with respective scores on the AI.

If a strong statistical relationship can be established, then the following questions will be examined.

- RQ10: Will individuals high in EVO (as measured by the AI) show an increase in EVO (as measured by the EVM) following the MS manipulation?

- RQ11: Will individuals high in EVO (as measured by the AI) show a decrease in EVO (as measured by the EVM) following the DR manipulation?
- RQ12: Will individuals high in PVO (as measured by the AI) show an increase in PVO (as measured by the EVM) following the MS manipulation?
- RQ12: Will individuals high in PVO (as measured by the AI) show a decrease in PVO (as measured by the EVM) following the DR manipulation?

Following the assumptions in hypotheses from study 1, it is predicted that people high in EVO will have an increase in EVO scores in the MS condition and a decrease in the DR condition. The same trend is expected for PVO scores.

- H13: Individuals high in EVO (as measured by the AI) will show an increase in EVO (as measured by the EVM) following the MS manipulation.
- H14: Individuals high in EVO (as measure by the AI) will show a decrease in EVO (as measured by the EVM) following the DR manipulation.

Likewise, it the same patterns are predicted with PVO.

- H15: Individuals high in PVO (as measured by the AI) will show an increase in PVO (as measured by the EVM) following the MS manipulation.
- H16: Individuals high in PVO (as measure by the AI) will show a decrease in PVO (as measured by the EVM) following the DR manipulation.

CHAPTER 2: STUDY 1

The purpose of study 1 was to replicate Cozzolino, Staples, Meyers and Samboceti's (2004) study which proposed and supported the death reflection (DR) manipulation as a predictor of pro-social outcomes. Most aspects of the original study were maintained, except for some minor adjustments as noted here in detail.

Methods

Participants. The study being replicated had a total of 90 participants. Past terror management theory (TMT) research has demonstrated a wide range of effect sizes with the same manipulations (Burke et al., 2010). Keeping this in mind, a larger sample was collected to avoid statistical power issues. A preliminary power analysis indicated a need for 128 participants in order to find the anticipated effect level ($r = .25$, $p < .05$), and this exact number was drawn for the study. Study participants were sourced from a pool of undergraduate psychology students receiving course credit in return for their participation in various studies, of which the present study was one option. Participants self-reported demographic characteristics. 31.3% of participants identified as male ($n = 40$), 68% identified as female ($n = 87$), and .8% as "other" ($n = 1$). 64.1% of participants identified themselves as "White or European" ($n = 82$), 15.6% as "Hispanic or Central/South American" ($n = 20$), 5.5% as "Asian or Pacific Islander" ($n = 7$), and 2.3% as "African American or African" ($n = 3$). 12.5% of participants provided their own ethnic description ($n = 16$). The youngest participant was 18, the oldest was 55 and the mean age was 19.85 ($SD = 3.88$).

Procedure. The experiment was comprised of two parts, the first of which was completed outside of the lab electronically at least a week before the second portion, which

occurred in person. This lag was used to avoid participants intuiting what was being assessed in the outcome measure. All electronic parts of the experiment were administered using Qualtrics survey software. For the first part, participants filled out a brief demographic questionnaire (including: sex, age and ethnicity) followed by the newest iteration of the Aspiration Index (AI; see next section for discussion) (Grouzet et al., 2005). The second portion took place in a lab supervised by a research assistant. Participants completed all parts of the experiment on a computer, with the exception of the outcome measure and the word search puzzle distraction task. The computer randomly assigned each participant to one of three conditions: control, death reflection (DR) and mortality salience (MS). 47 were in the control condition, 38 in the DR condition and 43 in the MS condition.

In the DR manipulation, participants read a scenario (Appendix A) in which they were invited to imagine awaking to find themselves trapped in an apartment fire. The scenario outlined the helplessness of the situation and the inevitability of a swiftly approaching death. After reading the scenario, the participants answered four open-ended questions intended to provoke reflection on death and the life they had been living up to the point of their simulated death:

1. "Please describe in detail the thoughts and emotions you felt while imagining the scenario.
2. If you did experience this event, how do you think you would handle the final moments?
3. Again, imagining it did happen to you, describe the life you led up to that point.
4. How do you feel your family would react if it did happen to you?" (Cozzolino et al., 2004).

In the MS condition, participants answered the following question in writing: "In as many words and in as much detail as possible, please describe the thoughts, feelings, and emotions you experience when thinking about your own death" (Cozzolino et al., 2004). After this,

participants completed a simple 15 item word search (Appendix C) which was meant to distract them from conscious thoughts about death evoked from the MS manipulation. In terror management theory (TMT), thoughts about death are thought to have the greatest impact when they are present, but just beyond conscious awareness. Research has supported this assertion, finding that MS effects are strongest when the outcome measure is preceded by a delay/distraction (Greenberg et al., 1994).

In the control condition, participants answered an innocuous question meant to invoke no thoughts about death: "In as many words and in as much detail as possible, please describe the thoughts, feelings, and emotions you experience when thinking about your favorite music" (Cozzolino et al., 2004).

After the contents of each condition were administered, participants partook in a task designed to measure greedy behavior. Participants were provided with a note detailing an opportunity to win a $100 Amazon gift certificate as a result of taking part in the experiment (Appendix D). An envelope was provided with 20 raffle tickets, with the understanding that any participants after (an undisclosed number) would be drawing from the same limited number of tickets. The participant was informed that they were the fourth person to undergo this process, making it difficult to perform any meaningful calculus as to the normative number of tickets to take. Without an example from which to draw normative behavior, the participant was left to judge for themselves how many tickets suited them. The number of tickets taken was recorded by the researcher as the outcome measure to be compared across conditions.

Following selection of tickets, each participant was debriefed on the nature of the experiment and a winning raffle ticket was drawn at the completion of the study.

Measures.

Aspiration Index (AI) (see Appendix E): Kasser and Ryan's first iteration of this scale (1996) was intended to measure whether an individual oriented themselves more towards extrinsic or intrinsic goals. 32 different aspirations are rated on a 5-point Likert-type scale in terms of the aspiration's importance and its likelihood of being realized. This was the scale used in the study being replicated to establish levels of extrinsic value orientation (EVO).

A newer version of this scale was used in the present study (Grouzet et al., 2005), which assesses a much larger range of goals. 1,854 undergraduates from 15 different cultures were surveyed in order to outline a more widely generalizable conception of the multiple dimensions of goal striving. The cultures sampled from differed significantly in characteristics that on the face would appear to have significant impacts on the structure of aspirations, such as the centrality of individualistic or collectivist values.

An 11 (correlated) factor solution was determined by the authors. These factors, including their mean alpha coefficients are: financial success (.84), image (.76), conformity (.67), popularity (.73), self-acceptance (.79), affiliation (.81), community feeling (.75), physical health (.72), hedonism (.70), safety (.71) and spirituality (.90). Two pairs of opposing dimensions were purposed including the original intrinsic versus extrinsic, with the addition of self-transcendence versus the physical self (Figure 1). The advantage of using this newer measure was in the addition of nuance it offered while maintaining the presence of the original dimensions used in the study replicated. In this manner, the original analyses of the study dould be replicated faithfully, while adding the potential to explore if the added dimensions of physical self-value and transcendent self-value relate to the outcome measure significantly.

Results

All statistical analyses were performed using the "R" software program (R Core Team, 2018). R's functionality is expanded by the use of third-party packages that can be loaded into the software. See Appendix F for a complete list of the packages used in analyses.

Scale Construction. Variables from the AI were constructed using Kasser's guidelines (2019). Raw scores were computed for each subscale by calculating a mean response score for each subscale. An extrinsic value orientation score (EVO) was computed for each participant by subtracting scores on the intrinsic subscales (self-acceptance, affiliation, community feeling) from the extrinsic subscales (financial success, image and popularity). These EVO scores were converted to *z* scores in order to more clearly illustrate relative differences in EVO and to center the variable at the mean. Physical value orientation (PVO) was calculated by subtracting the transcendent-self subscales (spirituality, community feeling and conformity) from the physical-self subscales (hedonism, safety, physical health and financial success). PVO scores were also converted into *z* scores.

Exploratory Analyses. Exploratory analyses were conducted to detect outliers and to check for irregularities in the data. In order to determine if any condition had significant differences in participant EVO distribution, an ANOVA was calculated comparing all conditions' EVO scores to test for significance. Condition was not found to significantly predict EVO score ($F(2, 125) = 0.36$, $p > .1$, Table 1). In order to test if any condition had significantly higher scores in PVO, another ANOVA was calculated. Condition was not found to significantly predict PVO score ($F(2, 125) = 0.55$, $p > .1$, Table 2).

To explore the data a scatterplot of the differential relationship of EVO on the number of tickets taken was created for each condition, with a linear regression line overlaying the data

points (Figure 2). The regression lines were each observed with slopes in the predicted directions. However, the data did not appear to be neatly clustered around the regression line in all conditions, suggesting the likely presence of outliers that could have an outsize effect on slopes.

Boxplots were created in order to detect the presence of outliers that were 1.5 times the interquartile range (Hoaglin et al., 1983) (Figure 3). Nine cases were identified as outliers and were excluded from initial analysis. A new boxplot was created for each condition, and it was observed that the means of each condition were similar, suggesting no difference in the number of tickets taken across conditions (Figure 4). Another scatterplot with a linear regression line was created for each condition, comparing the differential relationship of EVO on the number of tickets taken (Figure 5). The slopes appeared very similar at first glance, with ticket numbers increasing in each condition at higher levels of EVO. A similar scatterplot was created to compare PVO scores (Figure 6). The slope for the control condition was observed to be positive, while the slopes for MS and DR appeared to be negative.

Regression and ANOVA Analyses (Outliers Removed). Multiple linear regression and ANOVA analyses were conducted with the data from which outliers had been removed.

EVO. The first model compared the direct effects of Mortality Salience (MS), Death Reflection (DR) and EVO scores on the number of tickets taken (to address H1 & H2; Table 3). To enable conditions to be used as categorical predictors in regression analysis, dummy coded variables were created for DR and MS, so that a zero on both variables indicated the control condition. The results of this analysis indicated that these predictors explained 9.37% of the variance in tickets taken (*adj.* $r^2 = .07$; $F(3,115) = 3.964$, $p < .05$). EVO was found to significantly predict the number of tickets taken ($\beta=.40$, $p<.01$). DR was not found to

significantly predict the number of tickets taken (β = -.65, p = .07), nor was MS (β = -0.56, p = .07). The beta for MS 2as observed to be going in the opposite direction of what was predicted and was approaching significance at p = .07 (H1). The beta for DR was observed to be going in the hypothesized direction and was approaching significance at p = .07 (H2).

To assess the impact of varying levels of EVO on the number of tickets taken in each condition (H3 & H4), a multiple linear regression was completed with EVO as an interaction term and DR and MS as predictors regressed on the number of tickets taken (Table 3). Results indicated that these variables predicted 9.9% of the variance in the number of tickets taken (*adj.* R^2 = .059; $F(5,113) = 2.49$, $p < .05$), a slight increase from the model without the interaction term. However, due to the decrease in adjusted r^2, it would suggest that the interaction term did not add significant meaningful variance to the model. EVO scores were still observed to be a significant predictor of the number of tickets taken (β = 0.55, p <. 05). MS was not found to significantly predict the number of tickets taken (β = -0.55, p > .05), nor was DR (β = -0.66, p > .05). Again, the beta for DR was observed to be smaller than the beta for MS and was approaching significance at .07. The interaction terms for MS and EVO and DR and EVO were not significant (β = -0.25, p > .05; β = -0.25, p > .05).

Calculation of a Johnson-Neyman interval was attempted to probe the interaction between DR and EVO and its impact on the number of tickets taken in order to determine if there were regions of significance in the observed data (Figure 7). The interval indicated that no region of EVO scores yielded a significant interaction (p < .05). A simple slopes analysis indicated a change in slopes at differing levels of EVO, two of which were approaching significance (slope at *mean* = -.66, p = .07; slope at + 1 *SD* = -.91, p = .07), suggesting a possible lack of statistical power (Figure 8). These changes in slopes were in the hypothesized direction (H4).

Calculation of a Johnson-Neyman interval was attempted to probe the interaction between MS and EVO, and it indicated that there were no regions of significance in the observed data (Figure 9). A simple slopes analysis at varying levels of EVO also yielded no significant results (-1 *SD*: β = -.31, p = .54; at the *mean*: β = -.55, p = .11; +1 *SD*: β = -.8, p = .1; see Figure 10). The direction of change in slope was, however, observed to be going in the opposite of the direction hypothesized (H3).

Although only EVO was found to significantly predict the number of tickets taken, there were other observable trends in the data that may become statistically significant with a greater number of participants. Since it was hypothesized that MS and DR conditions only have significant impact on participants high in EVO relative to control, a linear regression model may not best fit the data. To illustrate this, a scatter plot with a locally estimated scatterplot smoothing line (LOESS) was calculated (Figure 11). The plot appeared to support the notion that the linear model may not be the best fit for the data, and that significant changes may occur at 1 *SD* above and below the mean. Following Cozzolino et al's (2004) analysis process, data was filtered to include participants with EVO scores one standard deviation above and below the mean. This was then plotted with a regression line imposed (Figure 12). The plot shows very similar slopes between the control and MS, but a significantly lower slope for DR, suggesting that some change may have occurred for those highest in EVO in the DR condition; however, given the relatively few data points, individual cases may have an outsized effect on the observed slopes. A multiple linear regression was calculated to test the interaction of high EVO scores (+1 *SD* above the *mean*) with MS and DR (H5). None of the predictors or interactions significantly predicted the number of tickets taken ($F(5,27) = 1.45$, p = .24; Table 4).

PVO. A regression model was calculated with PVO, MS and DR (addressing H6 & H7) as predictors of the number of tickets taken, and the model accounted for 3.5% of the variance in the number of tickets taken (*adj* r^2 = .035; $F(3,115) = 1.374$, $p = .25$). None of the predictors significantly predicted the number of tickets taken (all *p's* > 05, Table 5). Another regression model was calculated following the previous one, but with the addition of an interaction term between PVO and MS, and PVO and DR (H8 & H9). This model accounted for 3.7% of the variance in the number of tickets taken (*adj.* r^2 = -.006; $F(5,113) = .87$, $p = .50$; Table 5). None of the predictors were significant at the .05 level.

Calculation of a Johnson-Neyman interval was attempted to probe the interaction between DR and PVO (Figure 13 & 14). No areas of significance were found in the observed data. Attempts to find regions of significance for MS at differing levels of PVO yielded non-significant effects, but also indicated a pattern of decreasing slopes at higher levels of PVO (Figure 14). Calculation of a Johnson-Neyman interval was attempted to probe the interaction between MS and PVO (Figures 15 & 16), which also yielded no regions of significance within the observed data.

Regression Analyses (Outliers Retained). Although the outlier analysis made a strong argument for the removal of nine cases, analyses were run with the outliers retained in order to establish the impact of outliers on statistical significance as well as the direction and strength of relationships between predictors and outcome variables.

EVO. A regression model was calculated to compare the effects of MS and DR (relative to control), and EVO on the number of tickets taken (Table 6). This model accounted for 4% of the variance in the number of tickets taken (*adj.* r^2 = .02). None of the variables significantly predicted the number of tickets taken ($F(3,124) = 1.71$, all *p's* > .05). The next model added an

interaction term between EVO and MS/DR (H3 & H4). This model accounted for 5% of the variance in the number of tickets taken. None of the predictors or the interaction term significantly predicted the number of tickets taken (*adj.* r^2 = .01; $F(5,122) = 1.29$, all *p's* > .05; Table 6). Calculation of a Johnson-Neyman interval was attempted to probe the interaction between DR and EVO, and it indicated that there were no regions of significance in the observed data (Figure 17). This analysis was also performed to probe the interaction between MS and EVO, which again indicated no regions of significance (Figure 18).

PVO. A regression model was calculated with MS, DR (relative to control) and PVO as predictors of the number of tickets taken (H6 & H7). This model accounted for 3% of the variance in the number of tickets taken. None of the variables significantly predicted the number of tickets taken (*adj.* r^2 = .01; $F(3,124) = 1.34$, all *p's* > .05; Table 7). The next model utilized the same predictors and added an interaction term between PVO and the other two predictors (H8 & H9). This model accounted for 4% of the variance in the number of tickets taken. None of the predictors nor the interaction term significantly predicted the number of tickets taken (*adj.* r^2 = -.01; $F(5,122) = .9$, all *p's* > .05; Table 7).

Calculation of a Johnson-Neyman interval was attempted to probe the interaction between DR and PVO, and it indicated no regions of significance in the observed data (Figure 19). The same analysis was employed to probe the interaction between MS and PVO. Again, no regions of significance were indicated in the observed data (Figure 20).

Assessing Impact of Outliers. In each model employed to assess EVO and PVO, the models with outliers had considerably higher p values for each predictor, suggesting that the outliers may have added considerable noise to the data. Particularly suspect was that EVO was not significantly predictive of the number of tickets taken when outliers were retained in the

model (β = .283, p =.21). The expected predictive power of EVO was restored once the outlier cases were removed (β = .4, $p < .05$). The results of these models seem to suggest that the outliers masked observable effects in the data, increasing chances of a type I error, and that their removal was warranted.

Summary. Study 1 sought to test H1-H9, and in each instance the predictors of interest were not significantly related to the outcome. Participants in the DR condition did take fewer tickets than in the control (H2) and this predictor was approaching significance (p = .07). However, for H1-H9, no null hypothesis could be rejected.

CHAPTER 3: STUDY 2

The purpose of study 2 was to test the changes in values purported to occur under the death reflection (DR) manipulation. Since study 1 involved a behavioral measure from which value change was inferred, study 2 sought to more directly measure if change in values occurred. To do this a new method was developed that integrated qualitative and quantitative methods. This method was created in an attempt to measure a person's most salient values immediately following control, mortality salience (MS) and DR manipulations.

Methods

Participants. The source and method of participant selection was identical to study 1. The intention was to obtain a sample as least as large as the previous study; 151 participants were procured. 57% of participants self-identified as "female" (n = 86), 41.7% as "male" (n = 63) and 1.3% as "other" (n = 2). 64.9% of participants self-identified as "White or European" (n = 98), 12.6% as "Hispanic or Central/South American" (n = 19), 7.3% as "Asian or Pacific Islander" (n = 11), 5.3% as "African American or African" (n = 8), 1.3% of participants provided their own ethnic description (n = 2), and 8.6% provided no response (n = 13).

Procedure. The preliminary portion of study 2 was identical to study 1. Participants filled out the demographic form and the AI electronically at least one week before taking part in the in-person portion of the study. In this study, participants completed all parts of the in-person portion of the experiment on a computer, with exception of the distraction word search, while being supervised indirectly by a research assistant. Participants were randomly assigned by their computer to one of the three conditions. 58 participants were in the control, 42 in MS and 51 in

DR. After completion of the manipulation, participants were administered the Emergent Values Measure (EVM).

Measures.

Aspiration Index. See Study 1 for description and Appendix E for questionnaire.

Emergent Values Measure (EVM). The EVM is an experimental measure intended to decipher an individual's most salient values at the moment of administration. The EVM draws its methodology from the literature on free listing, a common tool used in anthropological research (Weller & Romney, 1988). By evaluating participants' own understanding of the domain of interest, some interpretive error from the researcher was hoped to be avoided.

Respondents were given the instruction to "Please exhaustively list what is most important to you right now." They were then provided with 20 fields (approximately a full web page in length on a standard HD computer monitor) in which to put what was most important to them. If they listed fewer than 6 items, they would receive a message saying: "Can you think of anything else that is important to you?" Respondents were not forced to provide a certain number of items before continuing with the measure. After advancing to the next page, respondents were asked to sort their items by rank order of most important to least important. On the next page, they were provided with the 11 dimensions of the AI. They were asked to sort each item into the category they felt it fit best into: "Please match your items to the group they most belong in."

The presumption in this measure was that the meaning of each dimension is self-evident, and that respondents would be able to establish the meaning they ascribe to their item by virtue of the category they put it into. This was intended to avoid some potential error that could come from researchers sorting the items into the categories. For example, two individuals might list

"my career" as an important item, and one might sort it into the "Financial Success" dimension, and another might sort it into the "Community" dimension, depending on the type of career they possess (e.g. Stock Broker versus Social Worker), and their relationship to it. By sorting their own items, it seemed that a more accurate estimate of the dimension might be obtained.

Results

Calculating EVM Scores. To calculate scores for the EVM, it was necessary to contend with the issue that participants listed different numbers of items. The *mean* number of items listed by participants was 11.46. The least number of items listed was 6, and the maximum was 20 (the limit set by the form). It was necessary to establish a total possible score that was consistent across participants in order to compensate for this variation. A value of 100 was chosen for its simplicity and range. A constant was calculated for each potential number of items. For example, the equation for the constant when a participant has 3 items would be:

$$\mathbf{1}\boldsymbol{x} + \mathbf{2}\boldsymbol{x} + \mathbf{3}\boldsymbol{x} = \mathbf{100}$$

This would result in a constant of 20. If a participant had 6 items, the equation would look like this:

$$\mathbf{1}\boldsymbol{x} + \mathbf{2}\boldsymbol{x} + \mathbf{3}\boldsymbol{x} + \mathbf{4}\boldsymbol{x} + \mathbf{5}\boldsymbol{x} + \mathbf{6}\boldsymbol{x} = \mathbf{100}$$

In this instance the constant would be 4.76.

Participants' rank ordering of their items was reverse scored, so that higher ranked items would be scored higher. For example, for a participant with 10 items, their highest ranked item would receive a score of 10, the second a score of 9, and so forth. Each of these raw item scores was multiplied by the constant calculated for the number of items the participant listed. For example, a participant who listed 10 items would have a constant of 1.82. Therefore, there highest ranked item would be scaled as such:

$$\mathbf{10 \times 1.82 = 18.2}$$

And their second highest ranked item would be scaled as such:

$$\mathbf{9 \times 1.82 = 16.38}$$

When all of a participant's scaled scores are added up, the sum is always 100. This way, even though participants listed a varying number of items, their scores could still be compared to one another.

To calculate dimension scores for the EVM, each participant's item scaled scores were calculated. When an item was sorted into a dimension, its scaled score was added to the cumulative score for that dimension. In this way, the relative importance of each dimension was assessed.

Assessing Convergent Validity. In order to make meaningful comparisons between the AI and the EVM, it was necessary to establish some degree of convergent validity (H10). If the respective dimensions of the AI and EVM correlated strongly and positively in the control condition, then it could be induced that there was some degree of similarity in construct coverage. Only in this instance could meaningful comparisons be drawn from differences between AI and EVM scores in the MS and DR conditions.

Due to some participants listing fewer items than there were dimensions, there was considerable missing data for many participants. Most participants had at least one dimension which they did not sort items into. A correlation matrix was calculated with all dimensions of the AI and EVM using pairwise complete observations (

Table 8), and correlations between respective dimensions of the AI and EVM were compared. Only the correlation for community feeling was statistically significant ($r = .37$, $p < .05$). The correlation for image was moderate ($r = .37$, $p > .05$), and the correlations for financial

success (r = .20, p > .05) and affiliation (r = .17, p > .05) were small in size, but none were significant at the .05 level. The remaining correlations were negative (all p's > .05).

Given issues of missing data and possible range restriction, it was thought that computing EVO and PVO scores for the EVM may provide a more useful basis for comparison (H11 & H12). Because they are made up of several subscales, these composite scores would be theoretically less susceptible to issues with missing data. EVO scores for the EVM were based off the same formula used with the AI. Intrinsic scale scores (self-acceptance, affiliation and community feeling) were subtracted from the extrinsic scale scores (financial success, image and popularity). PVO was also computed in the same way as with the AI. Transcendent-self scale scores (spirituality, community feeling and conformity) were subtracted from physical-self scale scores (hedonism, safety, physical health and financial success). A correlation matrix was calculated using EVO and PVO scores from both the AI and the EVM (Table 9). Scores on EVO between the two measures correlated at .24, and for the PVO at .18, but neither of the correlations was significant at the .05 level. The lack of a strong statistical connection between the two measures suggests that they likely have overlap, but that they might be measuring slightly different constructs. As a result, it was not feasible to effectively evaluate H13-H16.

Exploratory Analysis. A plot of the mean of each dimension of the EVO was calculated (Figure 21), in addition to rank ordered lists of dimensions for each condition (Tables 10 and 11). Interestingly, affiliation scored the highest for all three conditions by a considerable margin. The mean for affiliation was 29.76 (SD = 15.3) in the control, 37.57 in the MS condition (SD = 14.6) and 35.91 in the DR condition (SD = 14.3). The second highest scoring dimension for the control condition was financial success (M = 23.62, SD = 15.82), and the third was spirituality (M = 22.88, SD = 14.9). For the MS condition, the second highest mean was self-acceptance (M =

25.99, SD = 16.2) and the third was hedonism (M = 20.76, SD = 15.14). For the DR condition the second highest mean was spirituality (M = 22.9, SD = 20.16) and the third was hedonism (M = 20.64, SD = 15.1). No clear pattern emerged here of the prominence of intrinsic or extrinsic dimensions.

A series of ANOVAs were calculated to test for statistically significant differences between conditions on each dimension (see Tables 12-22). Two dimensions yielded significant results. Condition was found to significantly predict scores on the affiliation dimension ($F(2,145) = 4.01$, $p < .05$; Table 12), and the financial success dimension ($F(2,119) = 4.9$, $p < .01$; Table 18). A Tukey test was calculated for the affiliation model and found that the mean of the MS group was significantly different from the control (difference = 7.81, $p < .05$). The comparison of means between the DR group and control were approaching significance but didn't reach the .05 level (difference = 6.14, $p = .08$). A Tukey test was calculated for the financial success model and it found that the difference between the DR group and control was significant (difference = -9.11, $p < .01$).

Summary. Study 2 sought to test H10-H16. Convergent validity could not be established between the EVM and the AI (H10-H12), leading to a rejection of these hypotheses. H13-16 were reliant on that convergent validity and hence could not be tested.

DISCUSSION

The purpose of these studies was to explore the death reflection (DR) manipulation as a predictor of values change in a pro-social direction. Existing research on the manipulation seemed to suggest that the process of DR made people reorient their values in a more pro-social and other-centered manner (Blackie & Cozzolino, 2011; Cozzolino et al., 2004, 2009). These findings appeared to be promising given the many deleterious social effects found within the terror management theory (TMT) literature. Specifically, reminders of death have been linked with increases in racism (Greenberg et al., 2001), callousness towards animals (Lifshin et al., 2017), outgroup derogation (Greenberg et al., 1990), spiritual group conflict (Cook et al., 2015), stereotypic thinking (Schimel et al., 1999), and reckless driving (Taubman, 2000). In preponderance of the evidence, it appeared that DR might offer a healthier way to engage with mortality, a panacea to the ills created by death denial.

Study 1. The first study sought to replicate Cozzolino et al's findings (2004) in their original DR study. Given the promise of the manipulation, and the dearth of studies with unique authors validating its findings, replication was a necessary step in the process of evaluating DR's relevancy to the TMT literature.

The first research question concerned mortality salience's (MS) tendency to invoke selfish behaviors. It was predicted that those in the MS condition would take more tickets than in the control condition (H1). Although results were approaching significance at $p = .07$, the beta was in the opposite direction ($\beta = -0.56$), which indicated that H1 must be rejected. It was predicted that individuals in the DR condition would take fewer tickets relative to MS (H2). Results were again approaching significance at $p = .07$, but this time, in the hypothesized

direction (β = -.65). It should be acknowledged that the amount of change is just slightly over one half a ticket's difference between control and DR and a tenth of a ticket between DR and MS. Range restriction in the outcome measure may have some impact on the strength of the effect, and hence the statistical power needed to observe it. Currently, the null hypothesis cannot be rejected.

Following past research (Cozzolino et al., 2004; Kasser & Sheldon, 2000), it was hypothesized that at higher levels of extrinsic value orientation (EVO) people in the MS condition would take more tickets than in the control (H3). In addition, it was predicted that at higher levels of EVO, participants in the DR condition would take fewer tickets when compared to MS (H4). The interaction term was not significant in this model and the adjusted r^2 dropped sharply, suggesting that the addition of the interaction added little predictive power to the model. The beta for MS was higher than DR suggesting that DR participants took fewer tickets on average than MS participants, however neither of these predictors was significant at the .05 level. H3 and H4 must be rejected.

It was predicted that participants in the DR condition with EVO scores 1 *SD* above the mean would take fewer tickets when compared with the MS condition (H5), but the regression model was not significant. A probe of the interaction saw decreasing slopes from 1 *SD* below the mean, to the mean, to 1 *SD* above the mean, which were approaching significance at p = .07. The null hypothesis cannot be rejected currently, but it is worth considering if greater statistical power might detect the effect. In particular, when assessing participants 1 *SD* above and below the mean, the number of data points drops precipitously (just 11 data points for each condition) which drastically reduces power. Additionally, although study 1 had the number of participants as suggested from power analysis, the removal of 9 outliers dropped the sample to significantly

below these recommendations. Having the recommended number of participants (after removing outliers) could have made the DR effect significant as it was closely approaching significance at the .05 level ($p = .07$).

Given the relatively small betas seen in each model, it is worth contemplating how meaningful the effects purported to take place in these manipulations might be. How impactful is a half of a ticket of difference? Given that DR has seen some results with other outcome variables (Blackie et al., 2016; Blackie & Cozzolino, 2011; Cozzolino et al., 2014; Khoo, 2018), it may be that the outcome measure doesn't provide enough meaningful variance with only 20 tickets. The mean number of tickets taken was just 2.93 ($SD = 2.56$), with the minimum being 0 and the max being 14. It must be noted that those who took 9 tickets and above were considered outliers and were removed from the analysis, further restricting variance. The vast majority of people took just 1-4 tickets (the 1st and 3rd quintile, respectively) and those that took significantly more were identified as outliers. Analysis of the data with outliers retained resulted in poorer models across the board further justifying their removal. How much meaningful variation can be detected in the small range of tickets taken? Either the manipulations aren't as effective as they are purported to be, or the outcome measure isn't sensitive enough, or both.

The next set of research questions attempted to test the relationship of physical self-value orientation (PVO) to greedy behavior. It was predicted that higher levels of PVO would result in a greater number of tickets taken in the control condition (H6). The regression model with these predictors was not significant, leading to a rejection of H6. It was predicted that greater levels of PVO in the MS condition participants would lead to more tickets being taken relative to control (H7). It was also predicted that greater levels of PVO in the DR condition would lead to fewer

tickets being taken relative to control and MS (H8 & H9). The interaction term model was not significant leading to a rejection of H7, H8 and H9.

The idea that PVO would be impacted by MS and DR comes from the TMT literature on creatureliness (Goldenberg et al., 2001), where MS was seen to invoke aversion to reminders of our creatureliness. The theoretical connection between PVO and the outcome variable was admittedly weak, especially considering the orthogonal relationship (that is to say, minimal relationship) between the dimensions of the AI. If extrinsic values lead to greedy behavior, it is hard to draw inferences that the same would be true for physical self-value as there is little overlap between these two orthogonal factors.

Study 2. The second study sought to test if value changes occur under the MS and DR manipulations by implementing a new experimental measure called the Emergent Values Measure (EVM). Use of the AI as both a pre and post measure was avoided due to concerns about practice effects and concerns that this might mask changes. The EVM had participants free list what was most important to them at that moment, rank order those items, and then sort them into the 11 dimensions of the AI. Free listing operates under the assumption that the most salient, or most readily listable, items are the most important and relevant to the prompt. It was thought that people would be able to list their most significant values using this method.

In order to make meaningful comparisons, it was essential that a strong statistical relationship be observed between the EVM and the AI's respective dimensions. It was predicted that the respective dimensions would correlate together at $r = .5$ or greater and be significant at the .05 level (H10). No single correlation was found to have this magnitude or significance level. Very few correlations were significant, and only community feeling was moderate in size and significant ($r = .37$, $p > .05$.). Missing data was a significant and unanticipated problem with

the EVM. Given that participants could only list 20 items, and few did so, participants often did not have an item sorted into every category. Since a score of zero on these missed dimensions would not be meaningful, these instances had to be treated as missing data. For some categories there were few data points, in particular for popularity in the MS condition and conformity in the DR condition.

It was thought that comparing EVO and PVO scores across the measures might be a more robust way to make a comparison, since it is made up of scores from several subscales. It was predicted that EVO and PVO scores on the AI and EVM would correlate at or greater than $r = .5$, $p < .05$ (H11 & H12). Between the two measures, EVO was found to only correlate at .24, and PVO at .1, with neither being significant at the .05 level. This data did not establish convergent validity for the EVM, and hence there was no known path to make meaningful statistical assessments of change in comparing the AI and EVM. As a result, it was not possible to effectively test H13-H16 which predicted increases in EVO/PVO in MS conditions and decreases in the DR condition.

Exploration of the data did bear out some interesting insight. First and foremost, it was surprising that across each condition, participants sorted the greatest number of high ranked items into the affiliation category. This being an intrinsic category, it is interesting that it was the highest ranked among all dimensions by a wide margin. Tests were calculated to detect if there were any statistically significant differences in means for each category between conditions, and two categories had significant results. For the affiliation category, the difference between control and the MS group was significant, and somewhat large (difference = 7.81, $p < .05$). This is surprising, as MS is thought to invoke expression of more extrinsic values. Financial success was also found to be significantly different between the DR and control

condition by a substantial amount (difference = -9.11, $p < .01$). This is on par with what was expected from the DR manipulation as it is thought to increase the importance of relationships.

A Positive Psychology Narrative. One interesting possibility that emerges from these studies, is that perhaps people are not as bad as we might think they are. As observed in study 1, the majority of participants took just 1-4 tickets. In study two, participants on average rated affiliation as their highest value, regardless of condition. This finding led to a curiosity about the distribution of uncentered raw EVO scores (see Figure 22). To appreciate this data, it must be understood that EVO was calculated with mean scores from the three intrinsic subscales subtracted from the three extrinsic subscales. Mathematically speaking, this meant that intrinsic and extrinsic items had equal share in impacting EVO scores. The mean EVO score in study 1 was -6.13, with most participants having scores between -8.24 and -3.38 (*1st* and *2nd quintile*, respectively). A similar pattern was observed in study 2, with the mean being -6.51 (*1st quintile* = -9.06, *3rd quintile* = -3.82). This suggests that people may generally be more intrinsically oriented then extrinsically, at least in this sample.

Proponents of positive psychology have criticized the discipline of psychology for being bent on pathologizing human beings and being unwilling to celebrate human strengths and triumphs (Seligman & Csikszentmihalyi, 2000). The TMT literature is one place where gloom seems to pervade every corner. In Cozzolino et al's original study (2004), the difference between the mean number of tickets taken in the DR and MS conditions was about half of a ticket. One has to wonder if one half a ticket difference in mean between groups is really meaningful, particularly in light of the observation that people seem more intrinsically motivated on average. The TMT literature still offers provocative findings and a robust body of literature, but these findings should be contextualized in terms of how meaningful they are. As researchers,

we should look beyond statistically significant findings and consider the implications of the data at hand and whether it is meaningful or not.

Limitations

Both of these studies were limited in terms of their sample, which had little diversity, particularly in age. Much has been written about the problematic nature of college convenience samples in social science research (Henrich et al., 2010a, 2010b). These samples are characterized as being WEIRD (white, educated, industrialized, rich and democratic) and unreflective of humanity as a whole. The convenience of these samples will perpetuate their use, but we must continue to question the meaningfulness of results only observed within such samples. There are additional concerns about engagement with the research when studies are completed for class credit. It is hard to assess engagement, though Hunter's (2012) qualitative analysis of the DR prompt in the same research pool at this university illustrated promise that these manipulations are taken seriously by the majority of participants.

Both studies seemed to possibly suffer from issues with range restriction, which may detract from the validity of their results. In a few cases, results were found to be approaching statistical significance. It is hard to say if this was due to issues with measurement or if the anticipated effects just are not there to the extent predicted. Due to these considerations, these studies can be considered counterpoint to the literature on DR and TMT but cannot themselves invalidate those findings. More research, as seems the eternal refrain in this discipline, is certainly merited.

Study 1 functions off of the inference that higher levels of EVO, as measured by the AI, lead to greedier behavior under normal conditions (and other directions under manipulation). Although this seems intuitive, it must be acknowledged that the AI was not designed to measure

peoples' propensity for certain behavior. Hence, it must be acknowledged that behavioral expectations derived from AI scores are an extrapolation subject to measurement error.

One consideration in the failure to replicate Cozzolino et al.'s (2004) findings, is that some differences in laboratory conditions and administration could have had an impact. For example, study 1 was completed using a computer while Cozzolino et al. used paper versions of the manipulations and measures. Other undocumented aspects of Cozzolino et al.'s study may have also differed from the replication attempt, such as: room layout, research assistant involvement/training (or lack thereof), and differences in administration. One aspect that was changed from the original study was the prize to be raffled off. In the original study it was a $100 gift certificate to the school book store. It was thought that given profound changes in commerce and student shopping habits over the past 15 years, that a gift certificate to the school book store might not be what it was in 2004. It was thought that an Amazon gift card might be more relevant to students participating in the study, but it is possible that the change in prize may have impacted results in some manner.

Study 2 piloted a novel approach to developing the Emergent Values Measure (EVM) using free listing methods. This method was limited in the lack of previous research supporting free listing's implementation in this manner and was reliant on quantitative evidence to emerge to support its comparison to the AI. Such evidence was not observed in this study. This begs the question of how likely it would be that individuals would spontaneously generate content that would overlap with the AI in such a way that meaningful comparisons could be made. The AI provides one notion of how values are structured, and it was derived using empirical methods. A bottom up, "emergent" approach seems unlikely to arrive at the same factor structure. Additionally, expecting participants to intuit correctly the definitions of the dimensions defined

by the authors of the AI is a precarious assumption that is difficult to test. Such free listing and sorting methods may be useful in future research in psychology, but researchers should consider what sorts of comparisons will be quantitatively viable when designing future studies.

The DR manipulation itself has many limitations that should be acknowledged. While it tries to evoke the qualities of a near death experience, its status as a simulation is likely clear to participants. Although Hunter's research (2012) found that participants generally seemed to take the prompt very seriously, it seems questionable that a simulation would have as profound of an impact as the real thing. There may also be individual differences in the degree to which participants involve themselves in the simulation which may impact outcomes significantly. Hunter also proposed that some people may process the DR manipulation as an MS manipulation due to their level of engagement, further complicating interpretation of results.

Future Directions

Some commentary has emerged in the TMT literature, and in the social sciences in general, about potential issues with the "file drawer effect." Though the TMT literature is considered robust (Burke et al., 2010), there is concern that null findings, such as the present studies, are not being published. "Pre-registration" has emerged as a potential antidote to this crisis; a study is arranged to be published regardless of the outcome, which encourages the publication of null results. A few pre-registered studies have emerged failing to replicate classic TMT experiments (Rodríguez-Ferreiro et al., 2019; Sætrevik & Sjåstad, 2019). Given the null findings of this study, pre-registration would be a prudent idea for future TMT and DR research. Particularly given the sparse number of publications on DR in the 15 years since its inception, it begs the question of how many null results papers are locked away in a drawer.

Future research on DR would likely benefit from different outcome measures. There are a large number of classic MS experiments for which the DR manipulation could be added. It might be interesting, for example, to replicate the classic TMT experiment where participants set the bail bond price for a hypothetical prostitute (Rosenblatt et al., 1989). This study would likely benefit from a much larger range in its outcome measure. Further research is needed to support the prosocial effects of DR, and to clarify its relationship with MS across a variety of situations and circumstances.

Future efforts to employ an emergent measure such as the EVM should temper expectations to gain strong convergent validity with an existing measure. Increased accuracy might be attained by providing opportunities to generate more items, and with clearer prompts. In addition, it might help to have fewer sorting categories and to have those categories more explicitly defined. Ideally, some qualitative analysis of items would be performed to get a sense of how participants are responding to given listing and sorting tasks. This still could be a very interesting area of measurement development, but more understanding is needed of how such a method functions when analyzed mathematically.

Despite these studies not being able to find significant effects in line with predictions, it still seems that more research is needed in the TMT and DR literatures. Null results are part and parcel of the endeavor of progress in science. Given the rise of contradicting TMT research and the relative quiet front on DR, there may be more to these phenomena than what is well represented in the current literature. Further research in these domains is needed in order to appropriately contextualize these findings.

TABLES

Table 1
Fixed-Effects ANOVA results using EVO as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	0.00	1	0.00	0.00	.960		
Condition	0.72	2	0.36	0.36	.701	.01	[.00, .03]
Error	126.28	125	1.01				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 2
Fixed-Effects ANOVA results using PVO as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	0.67	1	0.67	0.66	.418		
Condition	1.10	2	0.55	0.55	.579	.01	[.00, .04]
Error	125.90	125	1.01				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 3
Regression results using tickets as the criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit	Difference
(Intercept)	2.76**	[2.29, 3.23]							
MS	-0.56	[-1.23, 0.11]	-0.17	[-0.36, 0.03]	.02	[-.03, .07]	-.07		
DR	-0.65	[-1.35, 0.05]	-0.19	[-0.38, 0.01]	.03	[-.03, .08]	-.12		
EVO	0.40**	[0.11, 0.68]	0.24	[0.07, 0.42]	.06	[-.02, .14]	.25**		
								R^2 = .094** 95% CI[.01,.19]	
(Intercept)	2.76**	[2.29, 3.23]							
MS	-0.55	[-1.23, 0.12]	-0.16	[-0.36, 0.04]	.02	[-.03, .07]	-.07		
DR	-0.66	[-1.36, 0.05]	-0.19	[-0.39, 0.01]	.03	[-.03, .08]	-.12		
EVO	0.55*	[0.09, 1.00]	0.34	[0.06, 0.62]	.04	[-.03, .12]	.25**		
I(EVO * MS)	-0.25	[-0.97, 0.47]	-0.08	[-0.31, 0.15]	.00	[-.02, .02]			
I(EVO* DR)	-0.25	[-0.93, 0.43]	-0.09	[-0.33, 0.15]	.00	[-.02, .03]			
								R^2 = .099* 95% CI[.00,.18]	ΔR^2 = .006 95% CI[-.02, .03]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 4
Regression results using tickets as the criterion

Predictor	*b*	*b* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	Fit
(Intercept)	2.50**	[1.03, 3.97]			
MS	-0.50	[-2.83, 1.83]	.01	[-.04, .05]	
DR	-0.83	[-2.91, 1.25]	.02	[-.06, .10]	
High EVO	1.70	[-0.48, 3.88]	.07	[-.09, .23]	
MS:High EVO	-0.56	[-3.70, 2.58]	.00	[-.03, .04]	
DR: High EVO	-1.17	[-4.25, 1.92]	.02	[-.06, .10]	
					R^2 = .212
					95% CI[.00,.35]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. sr^2 represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates p < .05. ** indicates p < .01.

Table 5

Regression results using tickets as the criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit	Difference
(Intercept)	2.77**	[2.28, 3.26]							
MS	-0.55	[-1.25, 0.14]	-0.16	[-0.37, 0.04]	.02	[-.03, .07]	-.07		
DR	-0.69	[-1.41, 0.04]	-0.20	[-0.40, 0.01]	.03	[-.03, .09]	-.12		
PVO	-0.02	[-0.31, 0.27]	-0.01	[-0.20, 0.17]	.00	[-.00, .00]	.01		
								R^2 = .035 95% CI[.00,.10]	
(Intercept)	2.76**	[2.27, 3.25]							
MS	-0.54	[-1.25, 0.16]	-0.16	[-0.37, 0.05]	.02	[-.03, .07]	-.07		
DR	-0.68	[-1.42, 0.05]	-0.19	[-0.40, 0.02]	.03	[-.03, .09]	-.12		
PVO	0.08	[-0.39, 0.55]	0.05	[-0.25, 0.35]	.00	[-.01, .01]	.01		
I(PVO * DR)	-0.17	[-0.85, 0.51]	-0.06	[-0.32, 0.19]	.00	[-.01, .02]			
I(PVO * MS)	-0.14	[-0.89, 0.60]	-0.05	[-0.29, 0.19]	.00	[-.01, .01]			
								R^2 = .037 95% CI[.00,.08]	ΔR^2 = .002 95% CI[-.01, .02]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates $p < .05$. ** indicates $p < .0$

Table 6

Regression results using tickets as the criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit	Difference
(Intercept)	3.47**	[2.73, 4.20]							
MS	-0.98	[-2.04, 0.08]	-0.18	[-0.38, 0.02]	.03	[-.03, .08]	-.11		
DR	-0.73	[-1.82, 0.37]	-0.13	[-0.33, 0.07]	.01	[-.03, .05]	-.05		
EVO	0.28	[-0.16, 0.73]	0.11	[-0.06, 0.29]	.01	[-.03, .05]	.11		
								R^2 = .040	
								95% CI[.00,.11]	
(Intercept)	3.47**	[2.73, 4.20]							
MS	-1.01	[-2.07, 0.06]	-0.19	[-0.38, 0.01]	.03	[-.03, .08]	-.11		
DR	-0.76	[-1.86, 0.34]	-0.14	[-0.33, 0.06]	.01	[-.03, .05]	-.05		
EVO	0.32	[-0.38, 1.02]	0.13	[-0.15, 0.40]	.01	[-.02, .03]	.11		
I(EVO * MS)	0.32	[-0.80, 1.44]	0.06	[-0.16, 0.29]	.00	[-.01, .02]			
I(EVO * DR)	-0.37	[-1.42, 0.68]	-0.08	[-0.32, 0.15]	.00	[-.02, .02]			
								R^2 = .050	ΔR^2 = .011
								95% CI[.00,.11]	95% CI[-.02, .05]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

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

Table 7

Regression results using tickets as the criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit	Difference
(Intercept)	3.45**	[2.71, 4.19]							
MS	-0.93	[-2.00, 0.14]	-0.17	[-0.37, 0.03]	.02	[-.03, .07]	-.11		
DR	-0.72	[-1.83, 0.39]	-0.13	[-0.33, 0.07]	.01	[-.03, .05]	-.05		
PVO	0.17	[-0.28, 0.62]	0.07	[-0.11, 0.24]	.00	[-.02, .03]	.08		
								R^2 = .032 95% CI[.00,.09]	
(Intercept)	3.46**	[2.71, 4.21]							
MS	-0.94	[-2.02, 0.13]	-0.17	[-0.37, 0.02]	.02	[-.03, .08]	-.11		
DR	-0.71	[-1.82, 0.40]	-0.13	[-0.33, 0.07]	.01	[-.03, .05]	-.05		
PVO	0.07	[-0.66, 0.80]	0.03	[-0.26, 0.31]	.00	[-.01, .01]	.08		
I(PVO * MS)	0.03	[-1.03, 1.10]	0.01	[-0.23, 0.25]	.00	[-.00, .00]			
I(PVO * DR)	0.34	[-0.79, 1.47]	0.07	[-0.16, 0.30]	.00	[-.02, .02]			
								R^2 = .035 95% CI[.00,.08]	ΔR^2 = .003 95% CI[-.02, .02]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. * indicates $p < .05$. ** indicates $p < .01$

Table 8

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. EVM Img	1.00																					
2. AI Img	0.36	1.00																				
3. EVM Pop	NA	-0.60	1.00																			
4. AI Pop	0.48	0.49**	-0.99	1.00																		
5. EVM Conf	-0.33	-0.14	NA	-0.79	1.00																	
6. AI Conf	0.48	0.55**	-0.24	0.49**	-0.09	1.00																
7. EVM Mny	-0.58	0.01	1.00	-0.03	-0.03	0.14	1.00															
8. AI Mny	-0.08	0.54**	-0.92	0.40**	0.69	0.40**	0.20	1.00														
9. EVM Hdn	-0.59	-0.26	-0.90	-0.06	-0.17	-0.11	-0.06	-0.11	1.00													
10. AI Hdn	0.06	0.26	-0.61	0.18	-0.94	0.08	-0.17	0.06	-0.06	1.00												
11. EVM Sfty	1.00	-0.24	NA	-0.50	NA	0.01	-0.45	0.02	0.03	-0.33	1.00											
12. AI Sfty	-0.07	0.19	-0.13	0.12	-0.45	0.16	-0.12	0.14	0.06	0.42**	-0.22	1.00										
13. EVM Hlth	0.41	-0.10	-0.23	-0.18	0.19	-0.04	-0.15	0.04	-0.05	-0.14	-0.27	0.10	1.00									
14. AI Hlth	0.31	0.07	-0.75	0.09	-0.48	0.00	-0.11	0.22	0.14	0.51**	0.11	0.44**	0.09	1.00								
15. EVM Slf Acc	-0.17	-0.34	-0.59	-0.26	-1.00	-0.27	0.22	-0.15	0.38	-0.08	0.58	0.03	0.13	0.08	1.00							
16. AI Slf Acc	0.25	0.09	-0.58	0.25	-0.88	0.06	-0.13	0.06	0.10	0.49**	-0.25	0.42**	0.01	0.43**	-0.14	1.00						
17. EVM Aff	-0.37	-0.16	0.13	0.05	-0.68	-0.15	-0.19	-0.10	-0.04	0.17	-0.53	0.22	-0.22	0.11	-0.09	-0.02	1.00					
18. AI Aff	0.24	0.11	-0.84	0.18	-0.98*	0.18	-0.26	-0.03	-0.01	0.53**	-0.26	0.56**	-0.03	0.38**	-0.31	0.70**	0.16	1.00				
19. EVM Comm	-0.05	0.08	NA	0.11	1.00	0.15	-0.43*	-0.22	0.08	-0.09	-0.10	0.10	-0.01	-0.06	-0.35	0.32	0.10	0.15	1.00			
20. AI Comm	0.25	-0.11	-0.32	0.24	-0.90	0.08	-0.17	-0.14	-0.04	0.44**	-0.06	0.25	-0.17	0.28*	-0.29	0.62**	0.14	0.68**	0.37*	1.00		
21. AI EVM Spr	0.01	-0.08	NA	-0.24	NA	-0.30	-0.06	-0.10	-0.13	0.30	-0.15	-0.19	0.08	0.42*	0.13	0.02	-0.44*	-0.02	-0.25	-0.07	1.00	
22. AI Spr	0.39	0.29**	-0.25	0.20	-0.49	0.23	-0.08	-0.13	-0.12	0.13	-0.03	0.10	-0.12	0.06	-0.16	0.26**	-0.05	0.36**	-0.05	0.27*	-0.04	1.00

EVM = Emergent Values Measure, AI = Aspiration Index, Img = Image, Pop=Popularity, Conf=Conformity, Mny=Financial Success, Hdn=Hedonism, Sfty=Safety, Hlth=Physical Health, Slf Acc=Self-Acceptance, Aff=Affiliation, Comm=Community Feeling, Spr=Spirituality. * indicates $p < .05$. ** indicates $p < .0$

Table 9

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1	2	3
1. AI EVO	-0.04	1.11			
2. EVM EVO	0.35	1.09	.24 [-.02, .47]		
3. AI PVO	-0.11	1.03	.13 [-.13, .38]	-.11 [-.36, .15]	
4. EVM PVO	0.08	0.95	.18 [-.08, .42]	.50** [.28, .67]	.10 [-.17, .35]

Note. M and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * indicates $p < .05$. ** indicates $p < .01$.

Table 10

Dimension rankings across all conditions

Condition	Dimension	Mean Score	SD
MS	Affiliation	37.57	14.6
DR	Affiliation	35.91	14.13
Control	Affiliation	29.76	15.13
MS	Self-Acceptance	25.99	16.2
Control	Financial Success	23.62	15.82
DR	Spirituality	22.90	20.16
Control	Spirituality	22.88	14.9
Control	Self-Acceptance	22.04	14.15
MS	Hedonism	20.76	15.14
MS	Financial Success	20.75	13.64
DR	Hedonism	20.64	15.1
Control	Safety	19.60	12.65
DR	Self-Acceptance	19.21	12.07
DR	Physical Health	19.14	11.02
MS	Spirituality	18.58	10.95
Control	Hedonism	18.55	13.13
MS	Community Feeling	17.38	14.2
Control	Community Feeling	16.91	12.94
Control	Physical Health	16.83	9.95
MS	Physical Health	15.47	11.5
MS	Image	15.40	12.06
DR	Financial Success	14.50	9.01
DR	Community Feeling	14.50	10.47
DR	Image	13.93	5.58
MS	Conformity	13.72	9.95
DR	Popularity	13.33	6.92
DR	Safety	13.07	6.09
MS	Safety	12.45	6.72
Control	Image	11.30	8.17
Control	Popularity	10.16	7.21
Control	Conformity	7.97	3.34
DR	Conformity	5.79	5.59
MS	Popularity	3.81	NA

Table 11

Rankings of each dimension per condition by mean score

	Control			Mortality Salience			Death Reflection		
Rank	Dimension	Mean Score	SD	Dimension	Mean Score	SD	Dimension	Mean Score	SD
1	Affiliation	29.76	15.13	Affiliation	37.57	14.6	Affiliation	35.91	14.13
2	Financial Success	23.62	15.82	Self-Acceptance	25.99	16.2	Spirituality	22.90	20.16
3	Spirituality	22.88	14.9	Hedonism	20.76	15.14	Hedonism	20.64	15.1
4	Self-Acceptance	22.04	14.15	Financial Success	20.75	13.64	Self-Acceptance	19.21	12.07
5	Safety	19.60	12.65	Spirituality	18.58	10.95	Physical Health	19.14	11.02
6	Hedonism	18.55	13.13	Community Feeling	17.38	14.20	Financial Success	14.50	9.01
7	Community Feeling	16.91	12.94	Physical Health	15.47	11.5	Community Feeling	14.50	10.47
8	Physical Health	16.83	9.95	Image	15.40	12.06	Image	13.93	5.58
9	Image	11.30	8.17	Conformity	13.72	9.95	Popularity	13.33	6.92
10	Popularity	10.16	7.21	Safety	12.45	6.72	Safety	13.07	6.09
11	Conformity	7.97	3.34	Popularity	3.81	NA	Conformity	5.79	5.59

Table 12
Fixed-Effects ANOVA results using EVM Affiliation as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	49613.36	1	49613.36	231.27	.000		
Condition	1721.72	2	860.86	4.01	.020	.05	[.00, .11]
Error	31106.69	145	214.53				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 13
Fixed-Effects ANOVA results using EVM Community Feeling as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	9154.90	1	9154.90	59.80	.000		
Condition	155.01	2	77.50	0.51	.604	.01	[.00, .05]
Error	13778.64	90	153.10				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 14
Fixed-Effects ANOVA results using EVM Conformity as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	253.89	1	253.89	6.13	.027		
Condition	174.21	2	87.11	2.10	.159	.23	[.00, .43]
Error	580.16	14	41.44				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 15
Fixed-Effects ANOVA results using EVM Hedonism as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	13421.46	1	13421.46	64.92	.000		
Condition	109.49	2	54.74	0.26	.768	.01	[.00, .03]
Error	20259.06	98	206.73				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 16
Fixed-Effects ANOVA results using EVM Personal Health as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	13876.33	1	13876.33	120.12	.000		
Condition	252.07	2	126.03	1.09	.339	.02	[.00, .06]
Error	13747.13	119	115.52				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 17
Fixed-Effects ANOVA results using EVM Image as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	1533.35	1	1533.35	19.67	.000		
Condition	80.63	2	40.31	0.52	.603	.04	[.00, .17]
Error	1793.22	23	77.97				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 18
Fixed-Effects ANOVA results using EVM Financial Success as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	26771.21	1	26771.21	148.71	.000		
Condition	1765.76	2	882.88	4.90	.009	.08	[.01, .15]
Error	21422.35	119	180.02				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 19
Fixed-Effects ANOVA results using EVM Popularity as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	309.60	1	309.60	6.20	.067		
cond.f	69.11	2	34.55	0.69	.552	.26	[.00, .49]
Error	199.58	4	49.90				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 20

Fixed-Effects ANOVA results using EVM Safety as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	5763.07	1	5763.07	69.74	.000		
Condition	437.00	2	218.50	2.64	.084	.12	[.00, .26]
Error	3223.04	39	82.64				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 21

Fixed-Effects ANOVA results using EVM Self-Acceptance as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	14093.15	1	14093.15	71.34	.000		
Condition	726.00	2	363.00	1.84	.165	.04	[.00, .11]
Error	17778.75	90	197.54				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively.

Table 22

Fixed-Effects ANOVA results using EVM Spirituality as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	$_{partial}\eta^2$	$_{partial}\eta^2$ 90% CI [LL, UL]
(Intercept)	15179.07	1	15179.07	58.22	.000		
Condition	214.88	2	107.44	0.41	.664	.01	[.00, .07]
Error	16426.65	63	260.74				

Note. LL and UL represent the lower-limit and upper-limit of the partial η^2 confidence interval, respectively

FIGURES

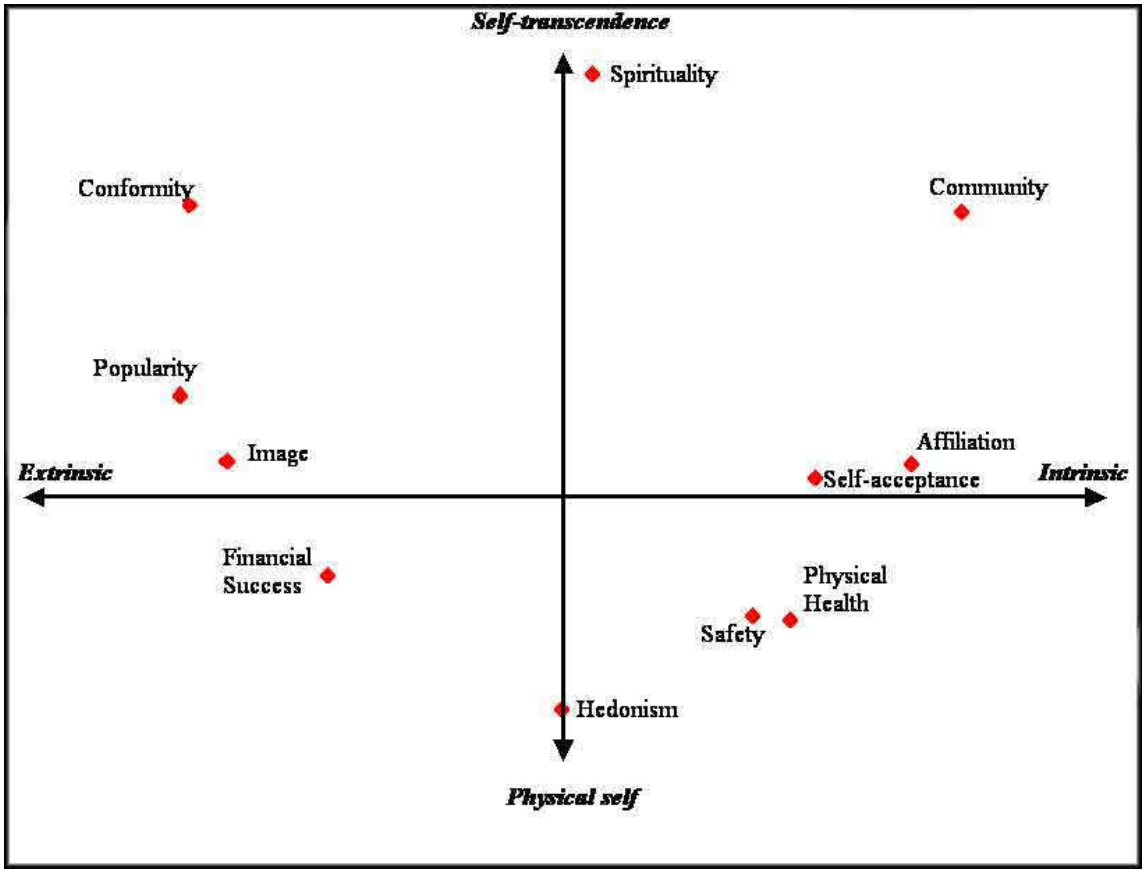

Figure 1

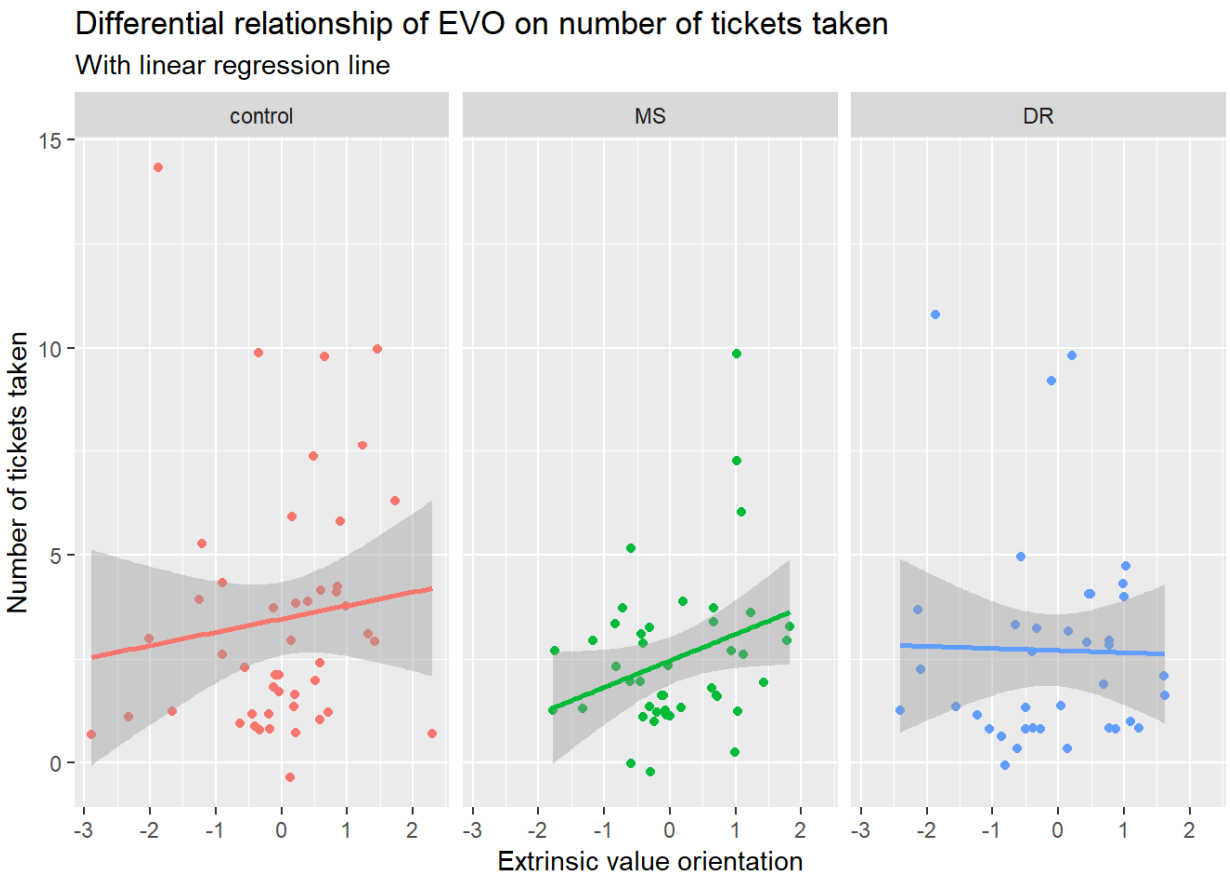
Differential relationship of EVO on number of tickets taken
With linear regression line
control
MS
DR
Number of tickets taken
15
10
5
0
-3
-2
-1
0
1
2
Extrinsic value orientation

Figure 2

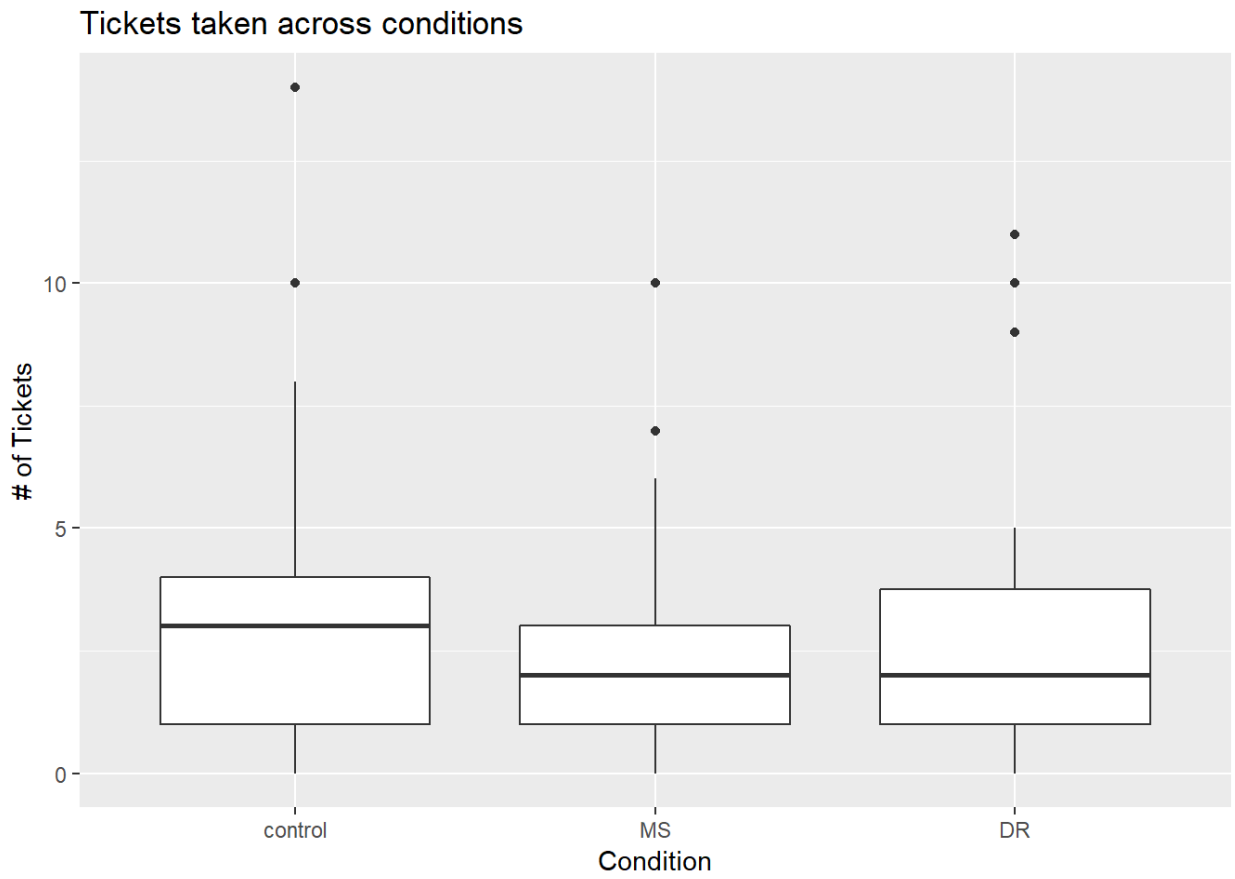
Tickets taken across conditions
# of Tickets
10
5
0
control
MS
DR
Condition

Figure 3

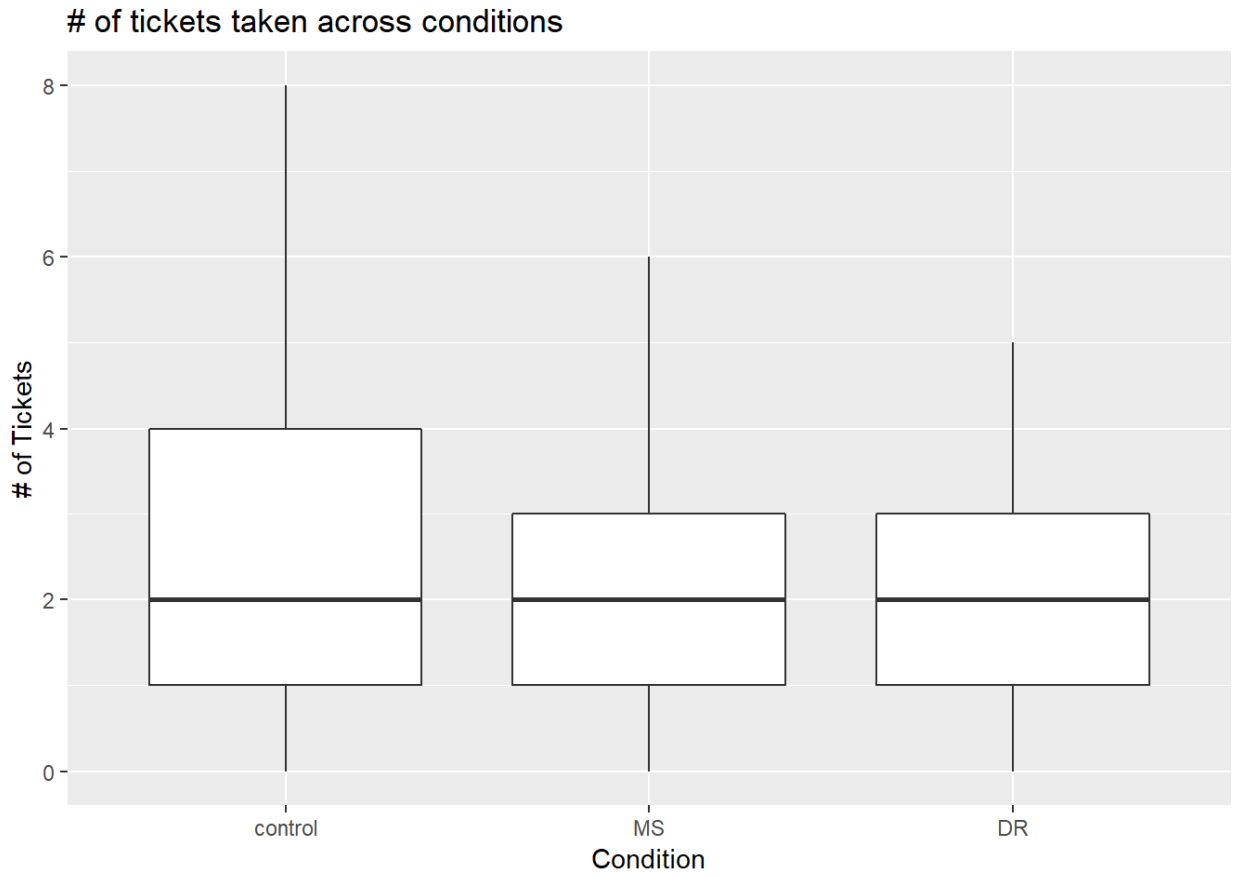
# of tickets taken across conditions
8
6
4
2
0
# of Tickets
control
MS
DR
Condition

Figure 4

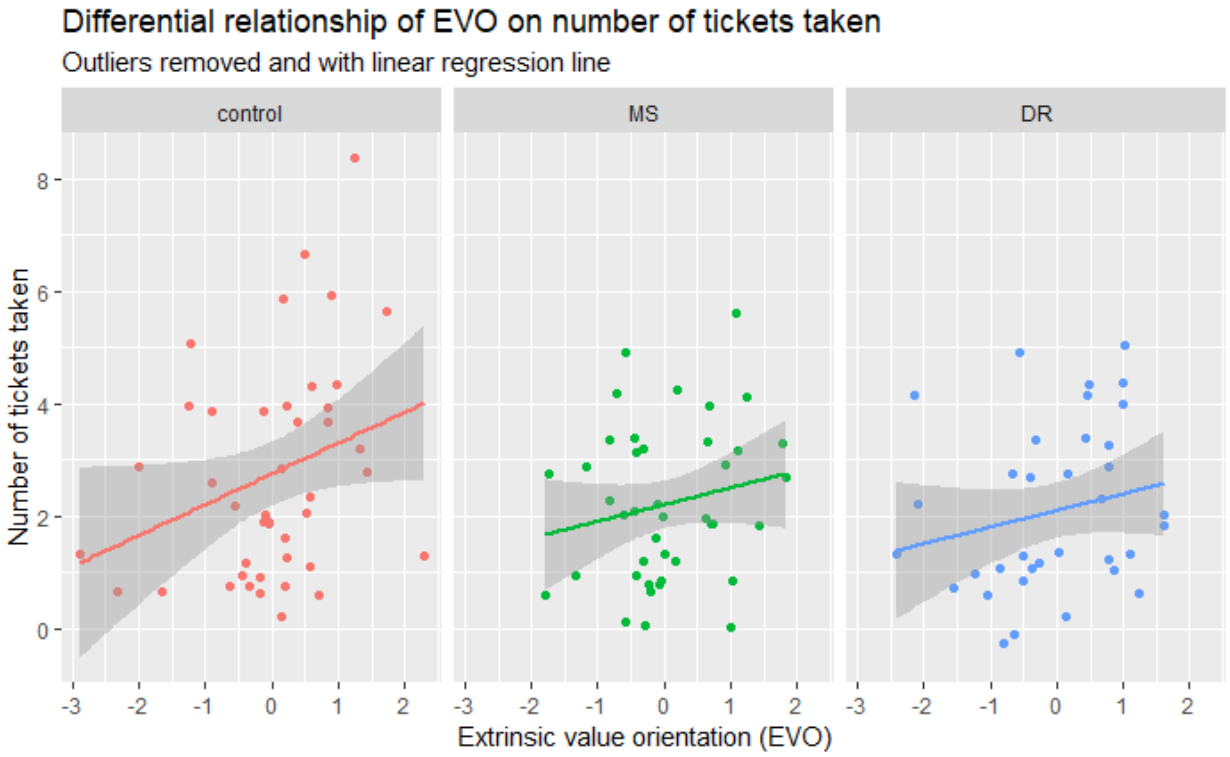
Differential relationship of EVO on number of tickets taken
Outliers removed and with linear regression line
control
MS
DR
Number of tickets taken
0
2
4
6
8
-3
-2
-1
0
1
2
Extrinsic value orientation (EVO)

Figure 5

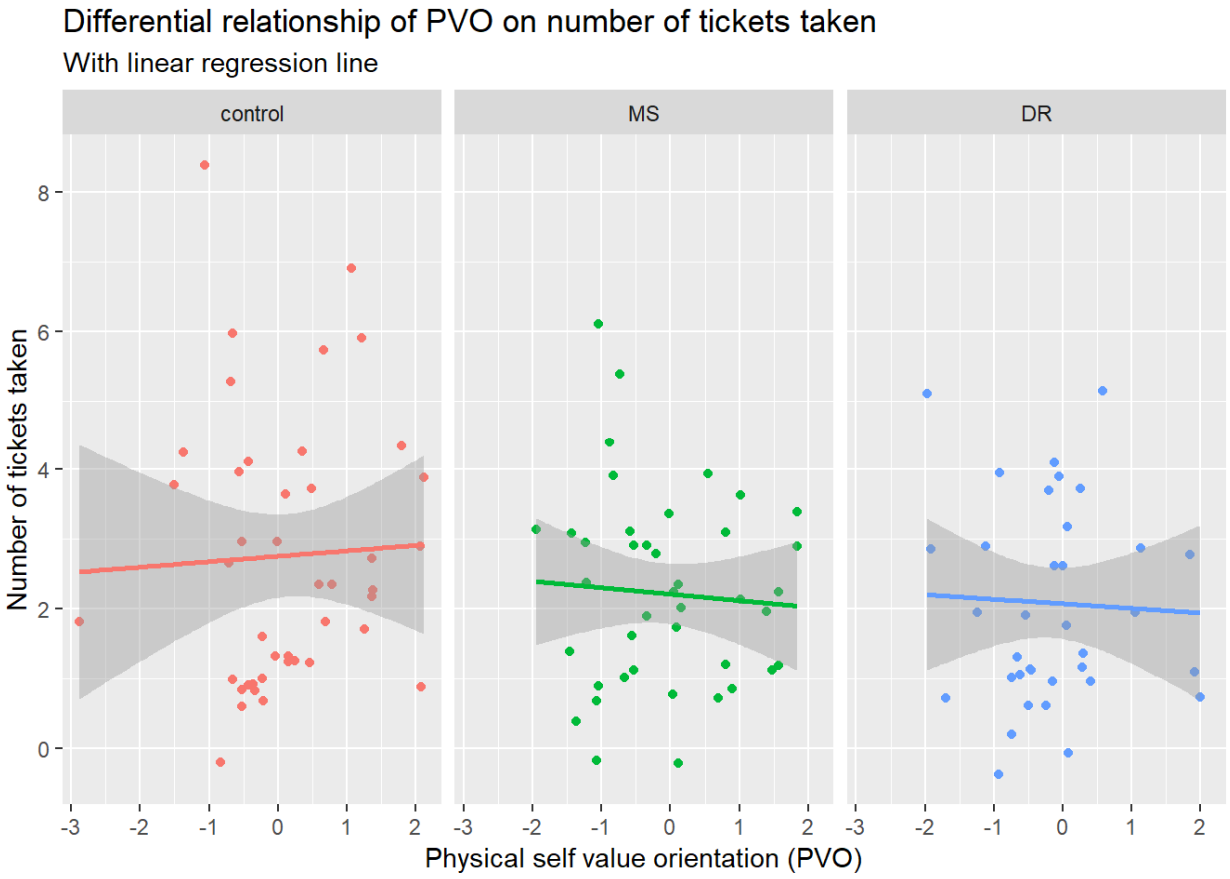
Differential relationship of PVO on number of tickets taken
With linear regression line
control
MS
DR
Number of tickets taken
0
2
4
6
8
-3
-2
-1
0
1
2
Physical self value orientation (PVO)

Figure 6

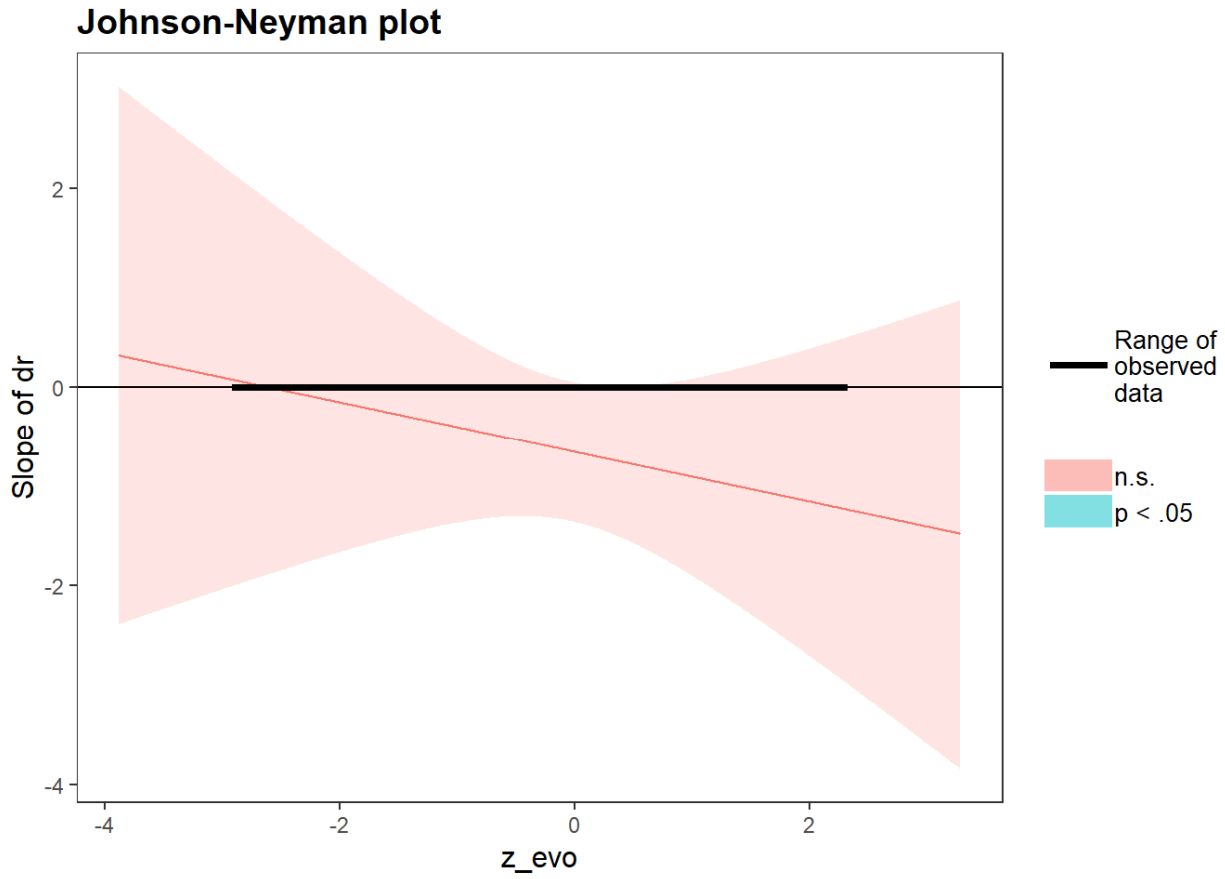
Johnson-Neyman plot
Slope of dr
2
0
-2
-4
-4
-2
0
2
z_evo
Range of observed data
n.s.
p < .05

Figure 7

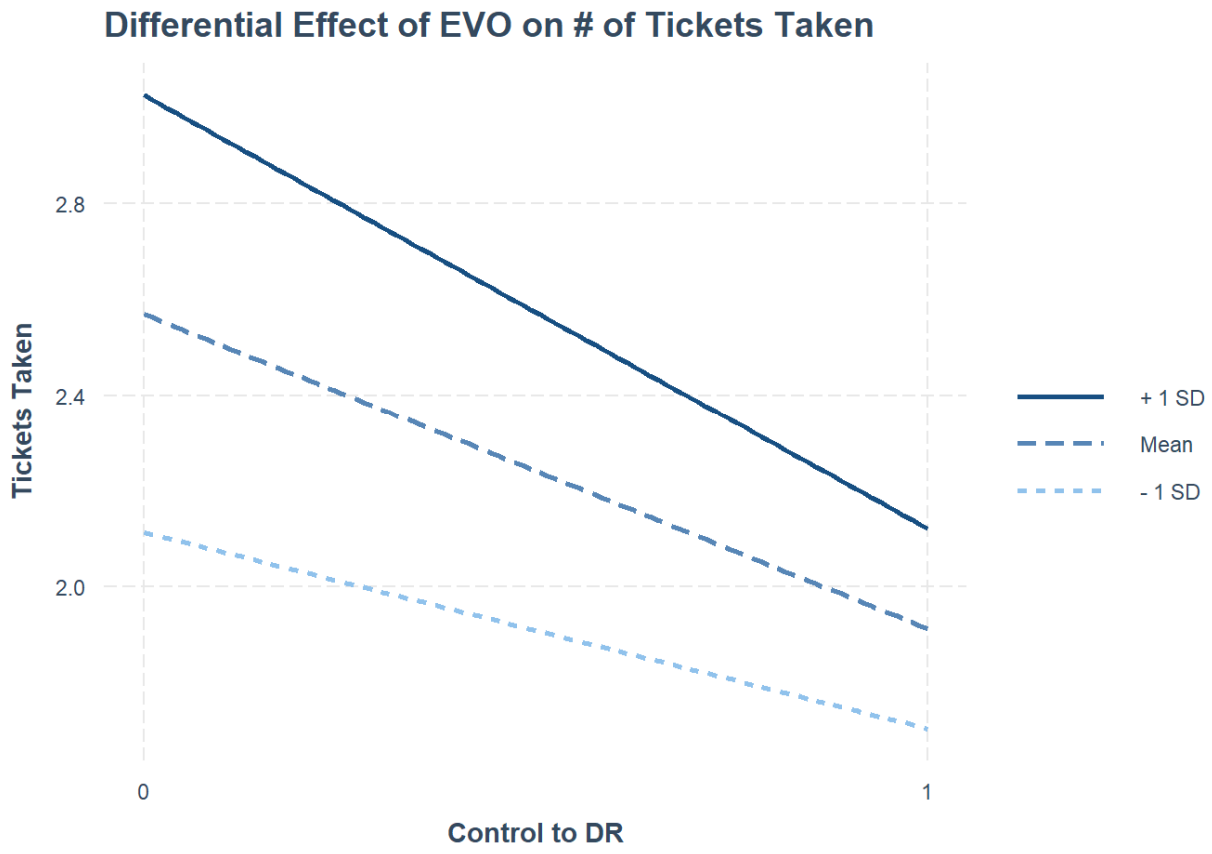
Differential Effect of EVO on # of Tickets Taken
Tickets Taken
2.8
2.4
2.0
0
1
Control to DR
+ 1 SD
Mean
- 1 SD

Figure 8

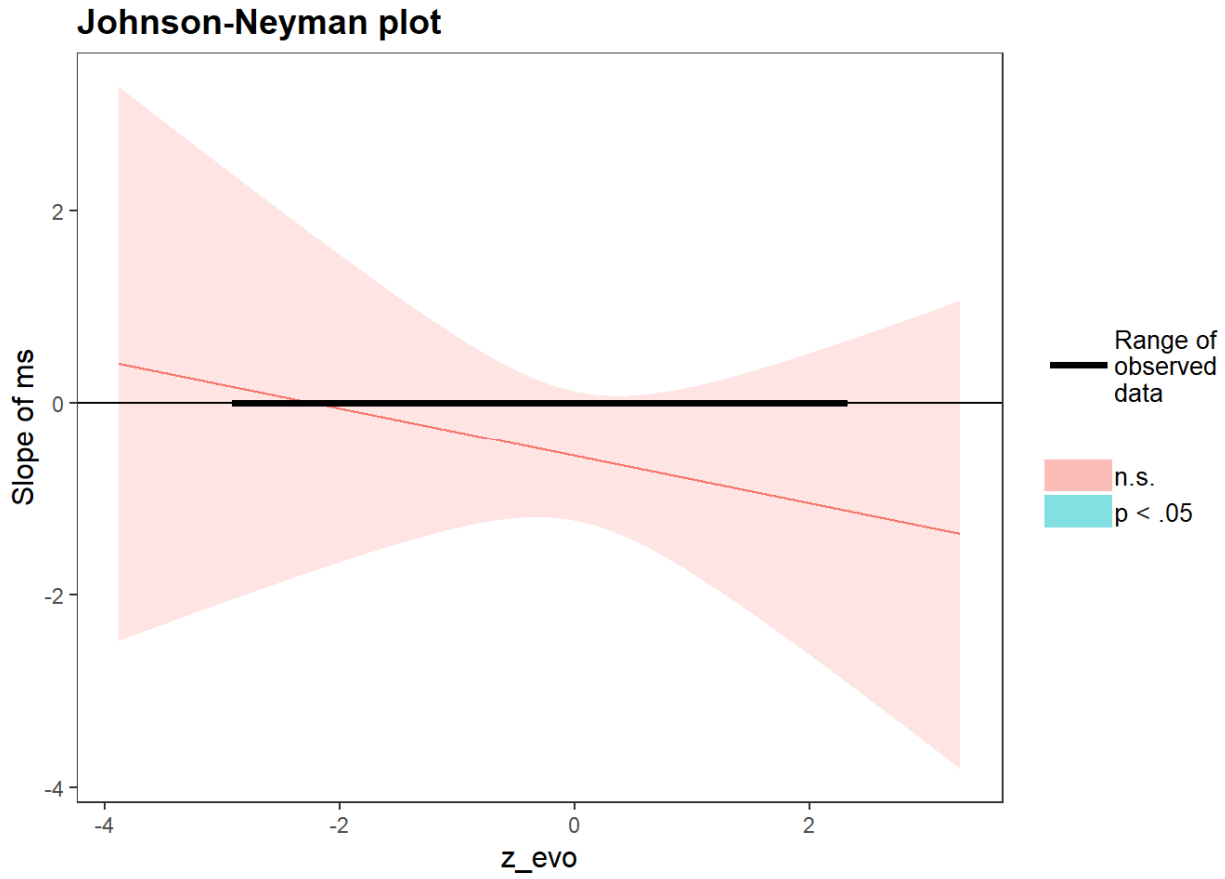
Johnson-Neyman plot
Slope of ms
2
0
-2
-4
-4
-2
0
2
z_evo
Range of observed data
n.s.
p < .05

Figure 9

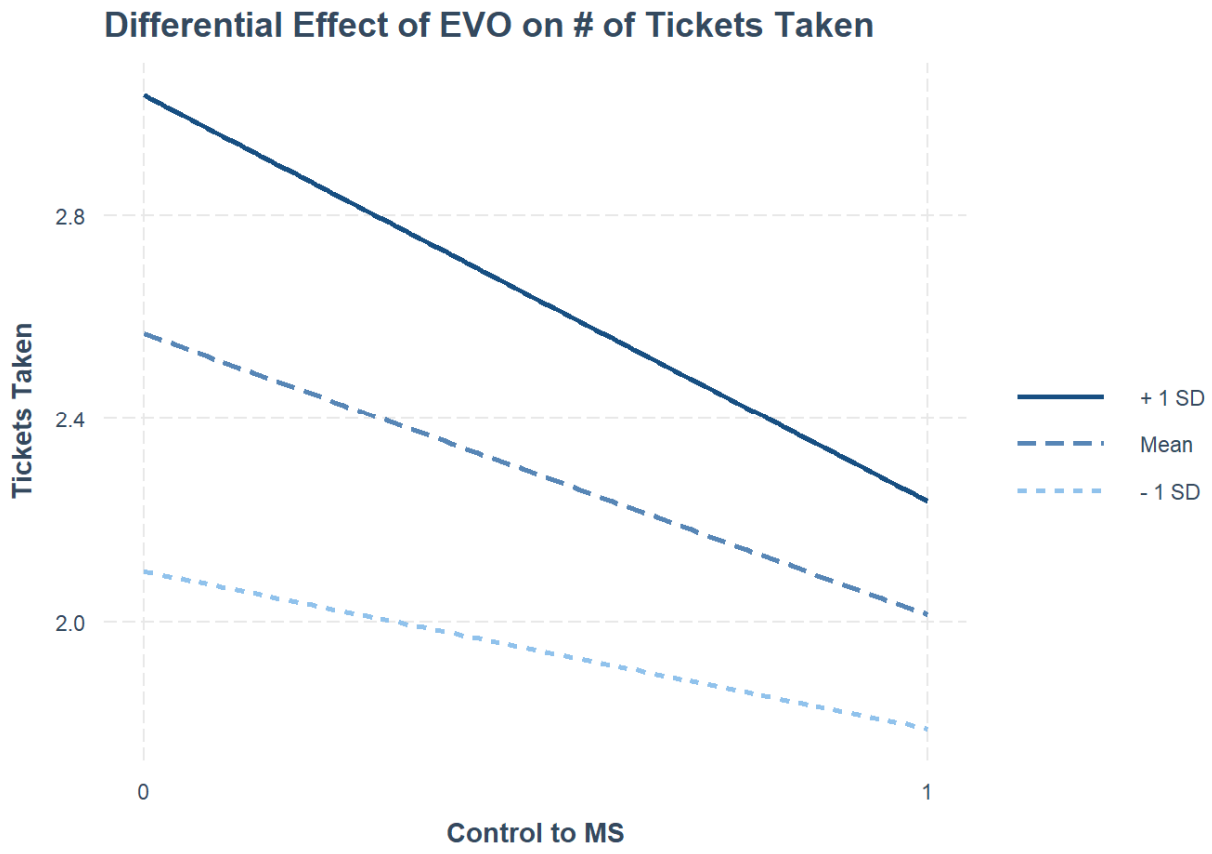
Differential Effect of EVO on # of Tickets Taken
Tickets Taken
2.8
2.4
2.0
0
1
Control to MS
+ 1 SD
Mean
- 1 SD

Figure 10

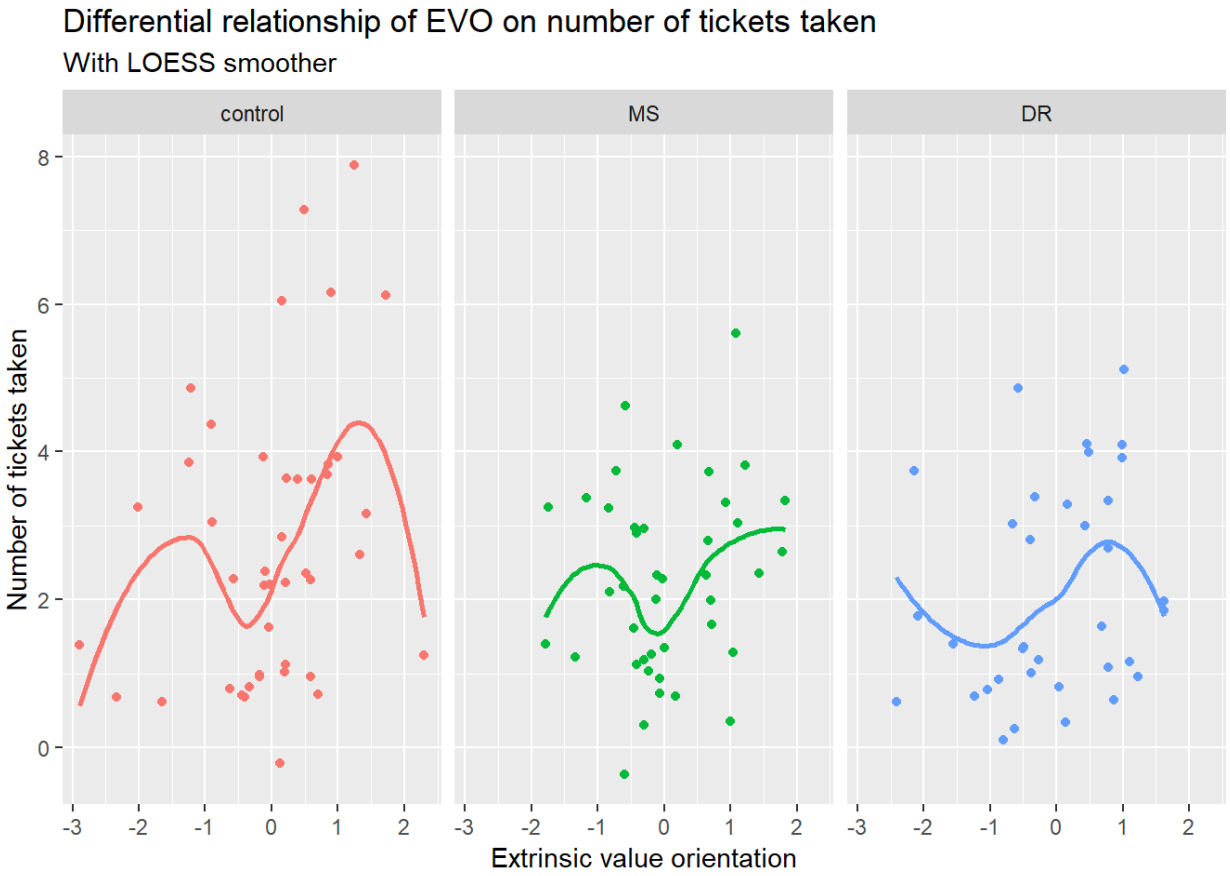
Differential relationship of EVO on number of tickets taken
With LOESS smoother
control
MS
DR
Number of tickets taken
0
2
4
6
8
-3
-2
-1
0
1
2
Extrinsic value orientation

Figure 11

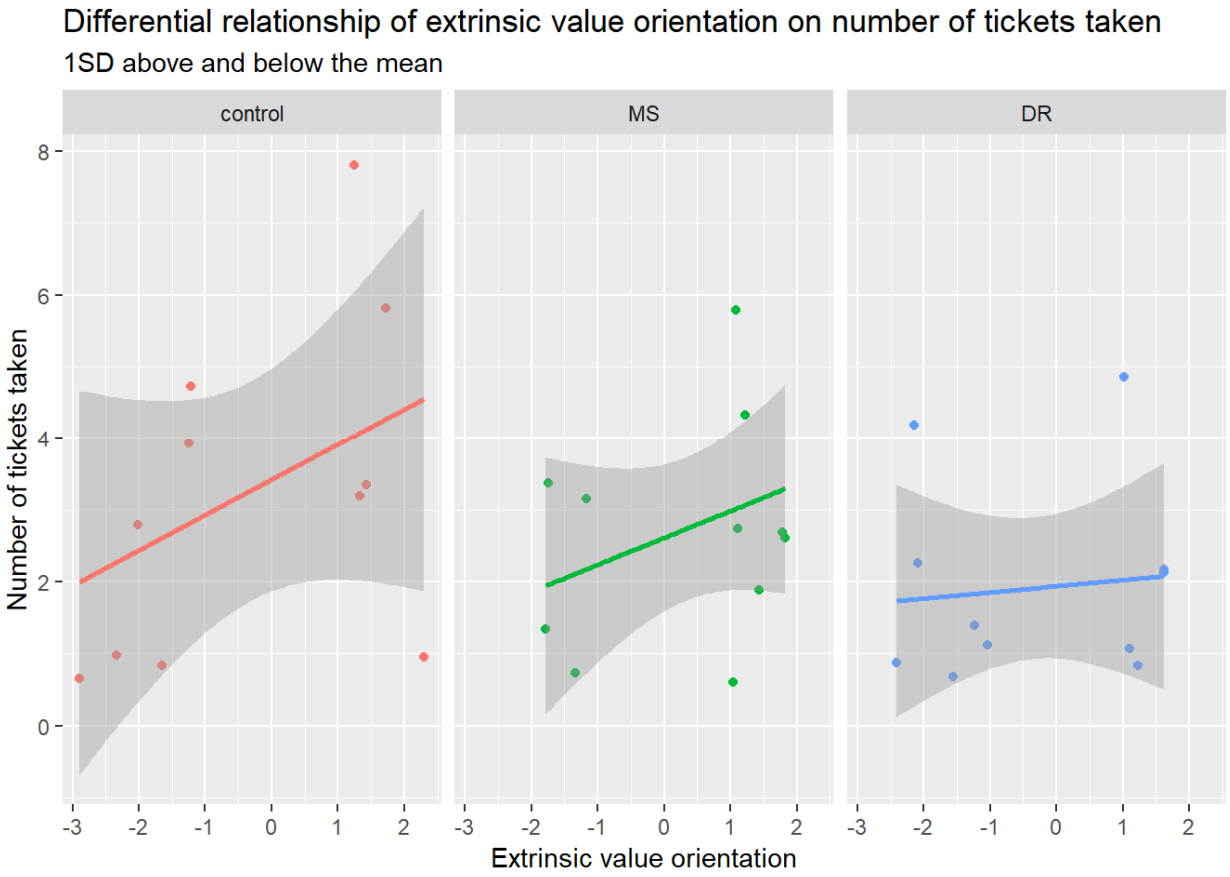
Differential relationship of extrinsic value orientation on number of tickets taken
1SD above and below the mean
control
MS
DR
Number of tickets taken
Extrinsic value orientation
0
2
4
6
8
-3
-2
-1
0
1
2

Figure 12

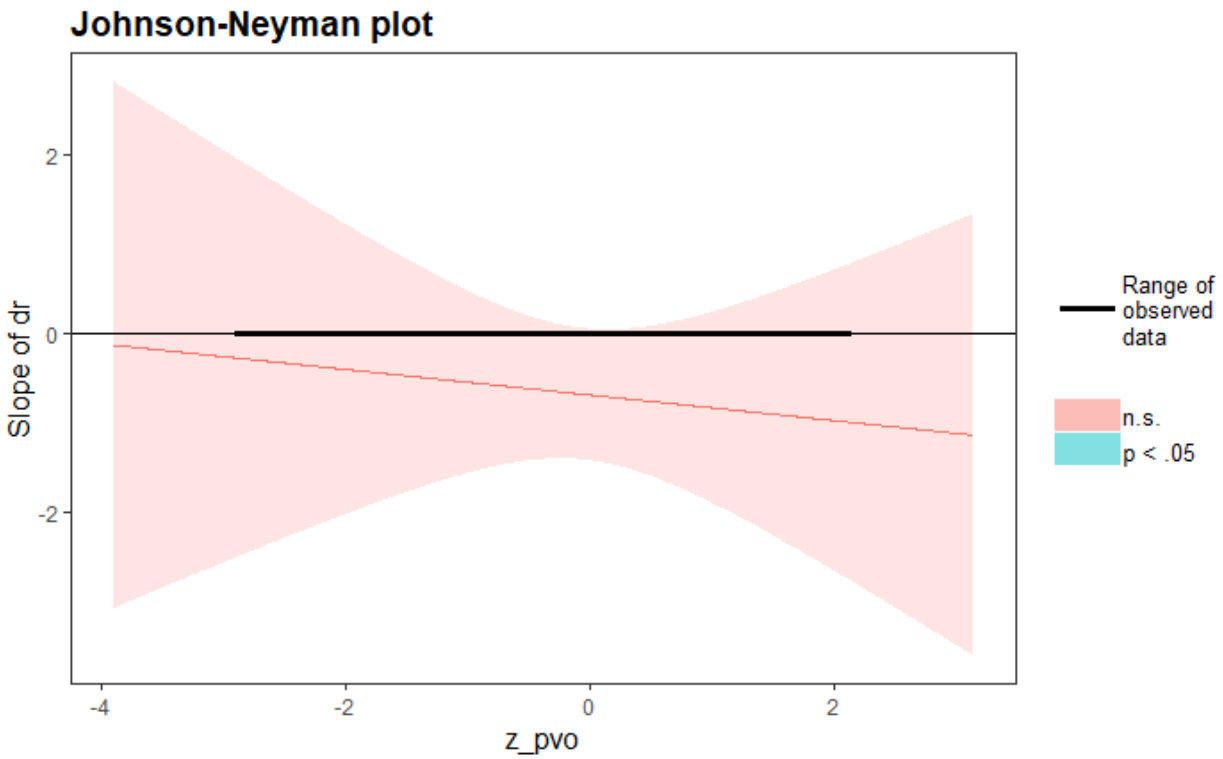
Johnson-Neyman plot
Slope of dr
2
0
-2
-4
-2
0
2
z_pvo
Range of observed data
n.s.
p < .05

Figure 13

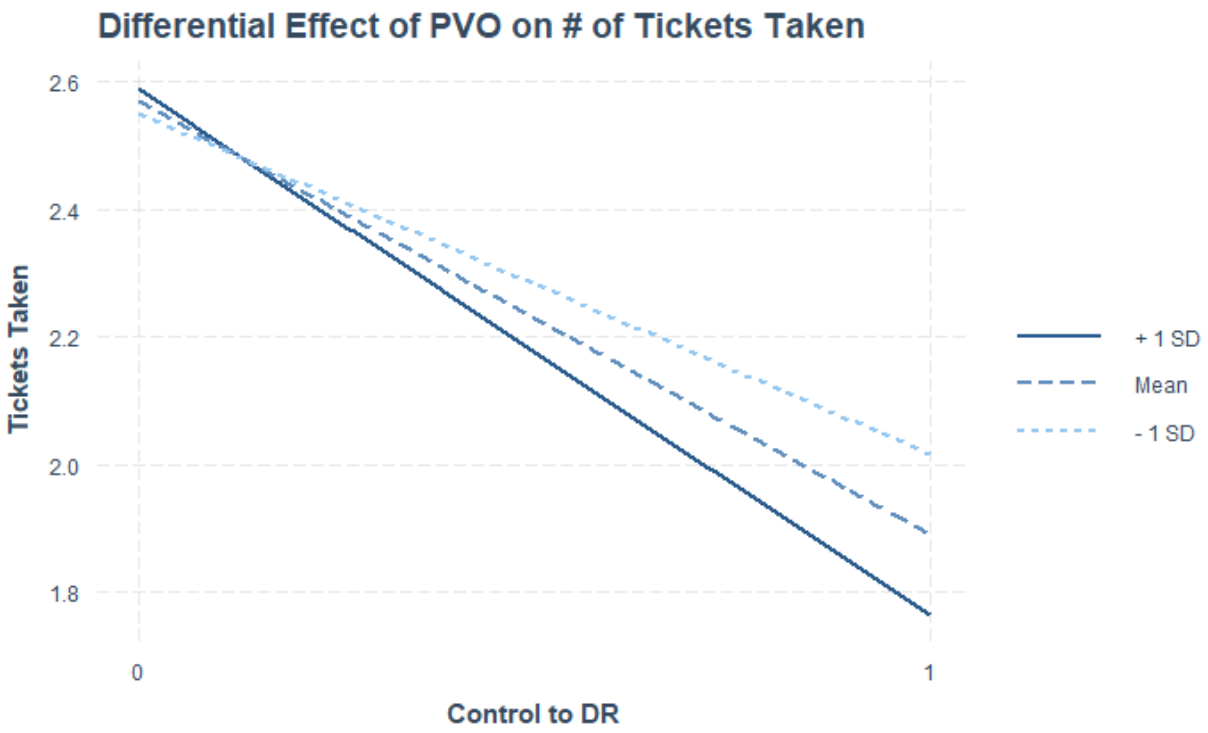
Differential Effect of PVO on # of Tickets Taken
Tickets Taken
2.6
2.4
2.2
2.0
1.8
0
1
Control to DR
+ 1 SD
Mean
- 1 SD

Figure 14

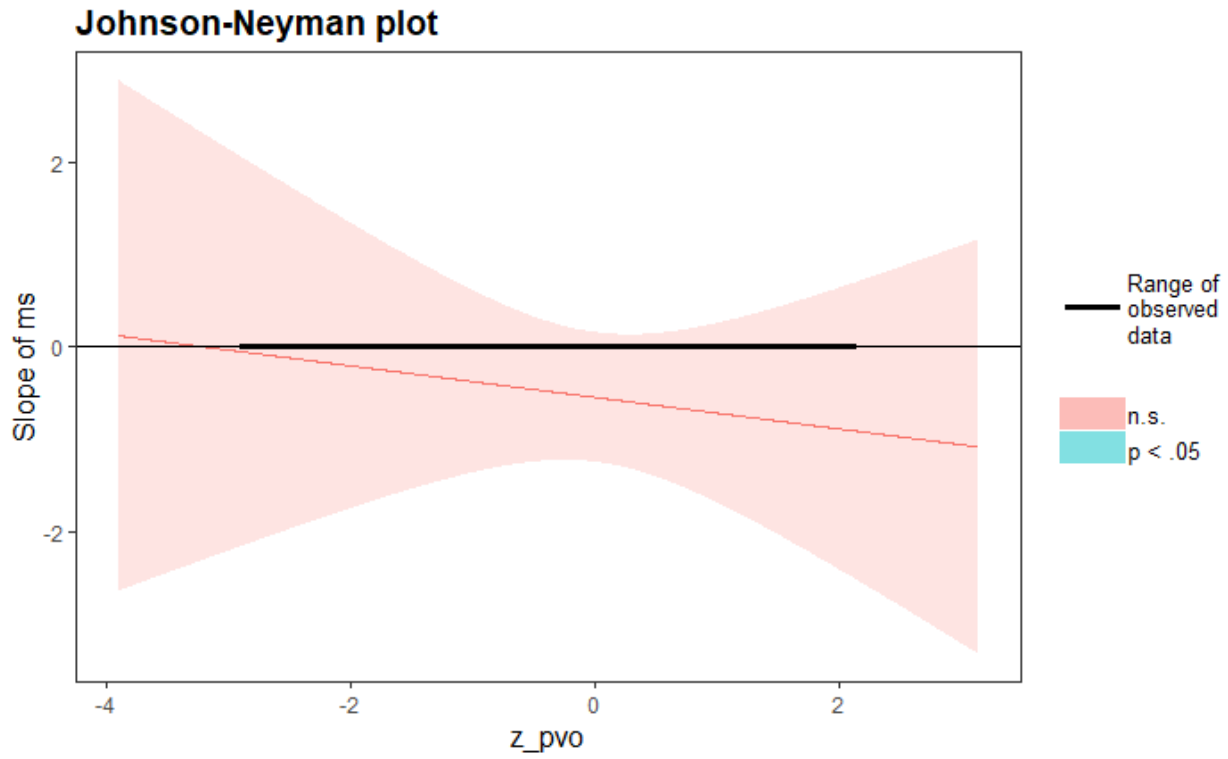
Johnson-Neyman plot
Slope of ms
2
0
-2
-4
-2
0
2
z_pvo
Range of observed data
n.s.
p < .05

Figure 15

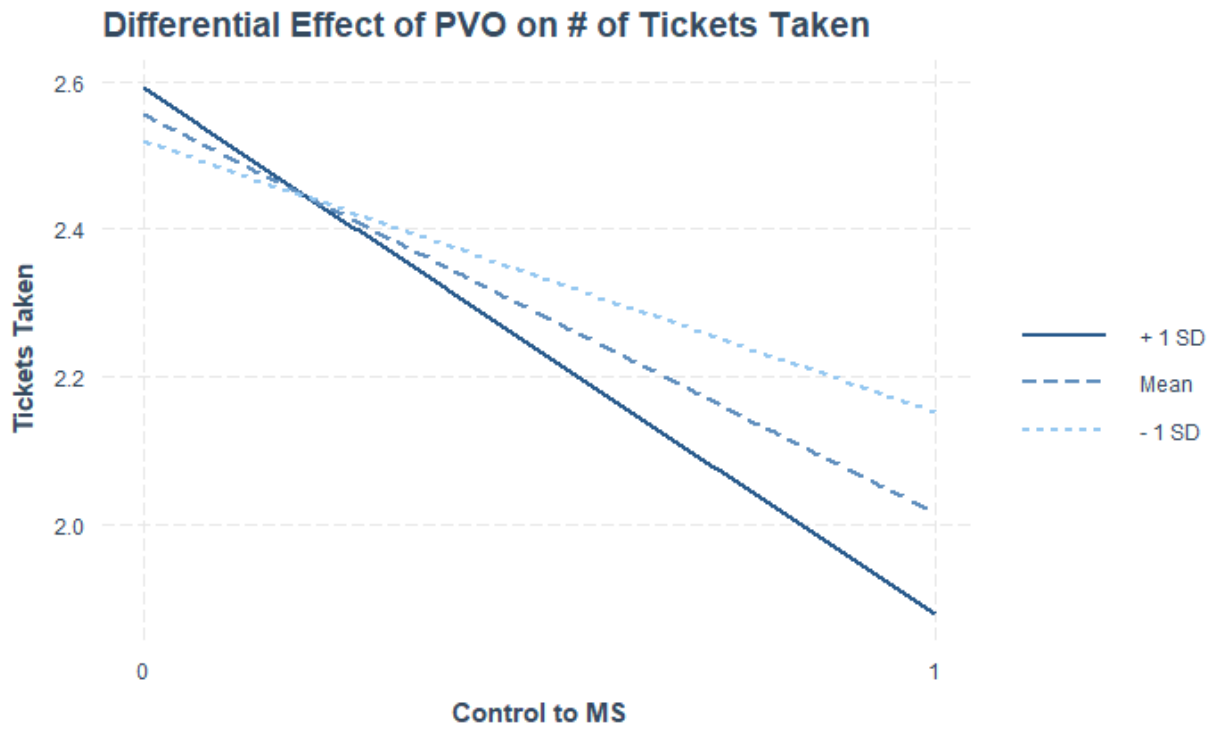
Differential Effect of PVO on # of Tickets Taken
Tickets Taken
2.6
2.4
2.2
2.0
0
1
Control to MS
+ 1 SD
Mean
- 1 SD

Figure 16

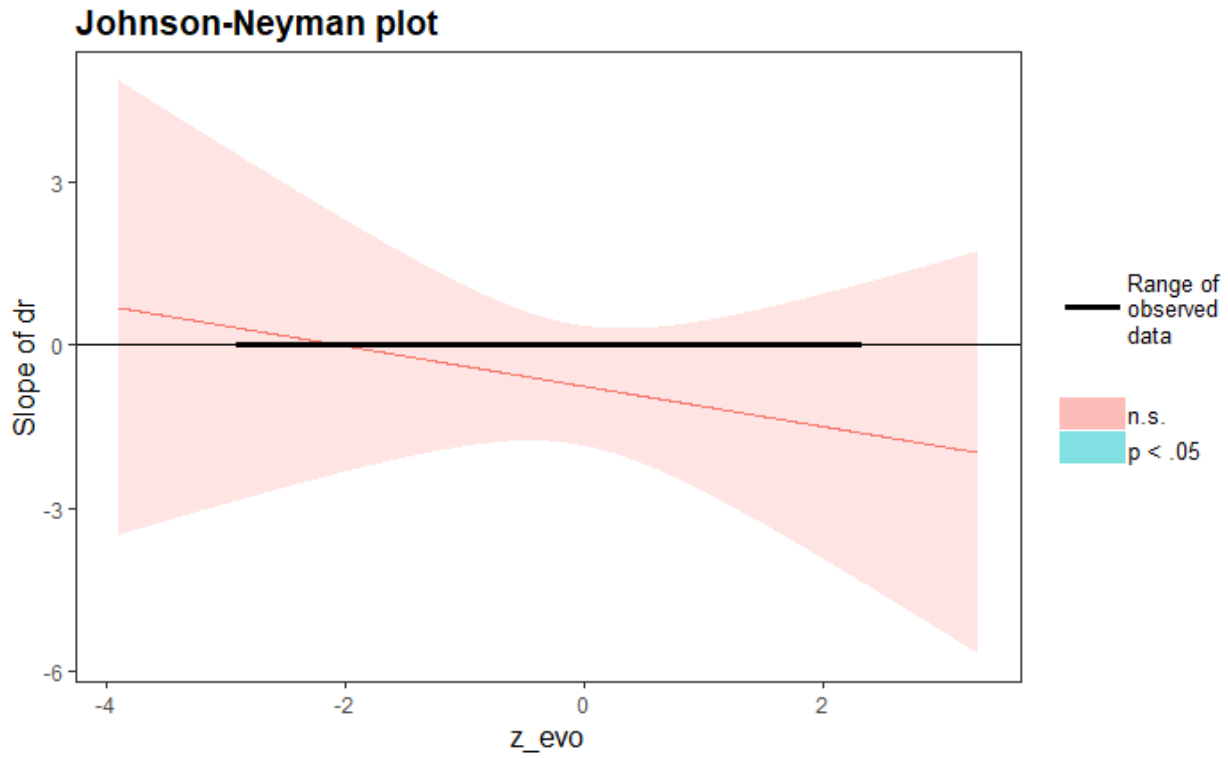
Johnson-Neyman plot
Slope of dr
3
0
-3
-6
-4
-2
0
2
z_evo
Range of observed data
n.s.
p < .05

Figure 17

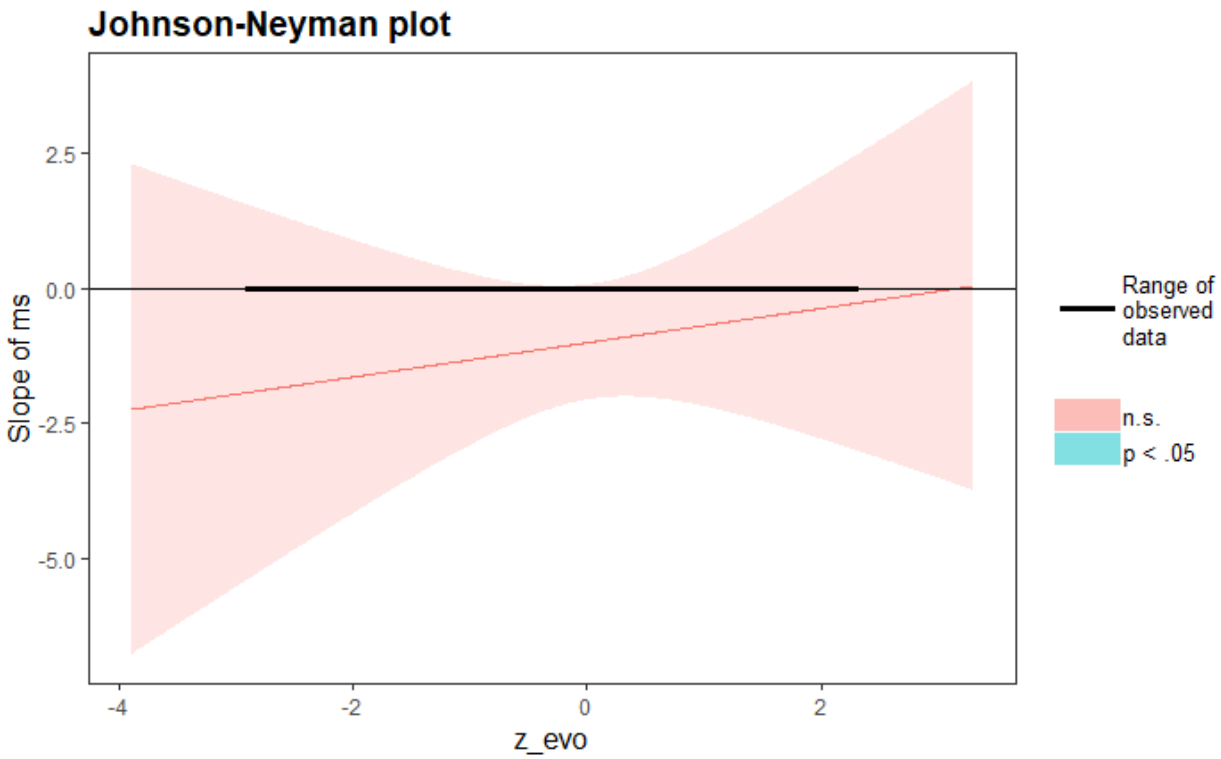
Johnson-Neyman plot
Slope of ms
2.5
0.0
-2.5
-5.0
-4
-2
0
2
z_evo
Range of observed data
n.s.
p < .05

Figure 18

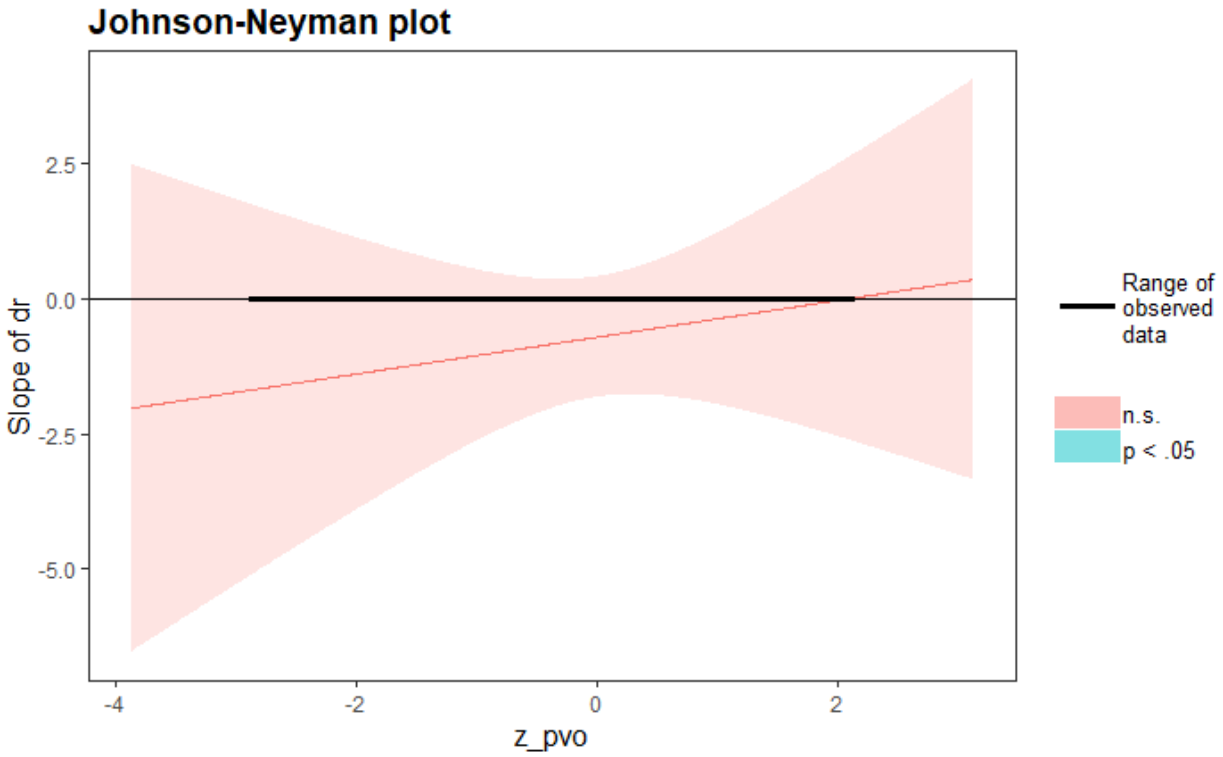
Johnson-Neyman plot
Slope of dr
2.5
0.0
-2.5
-5.0
-4
-2
0
2
z_pvo
Range of observed data
n.s.
p < .05

Figure 19

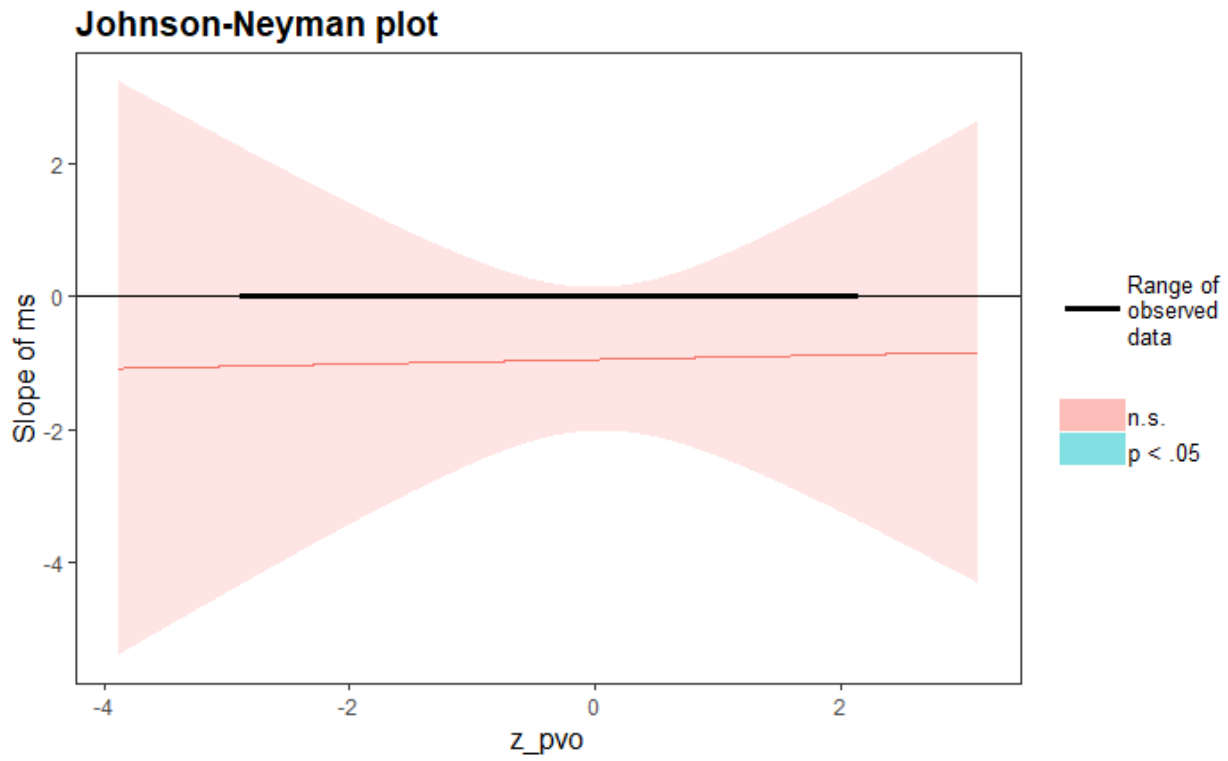
Johnson-Neyman plot
Slope of ms
2
0
-2
-4
-4
-2
0
2
z_pvo
Range of observed data
n.s.
p < .05

Figure 20

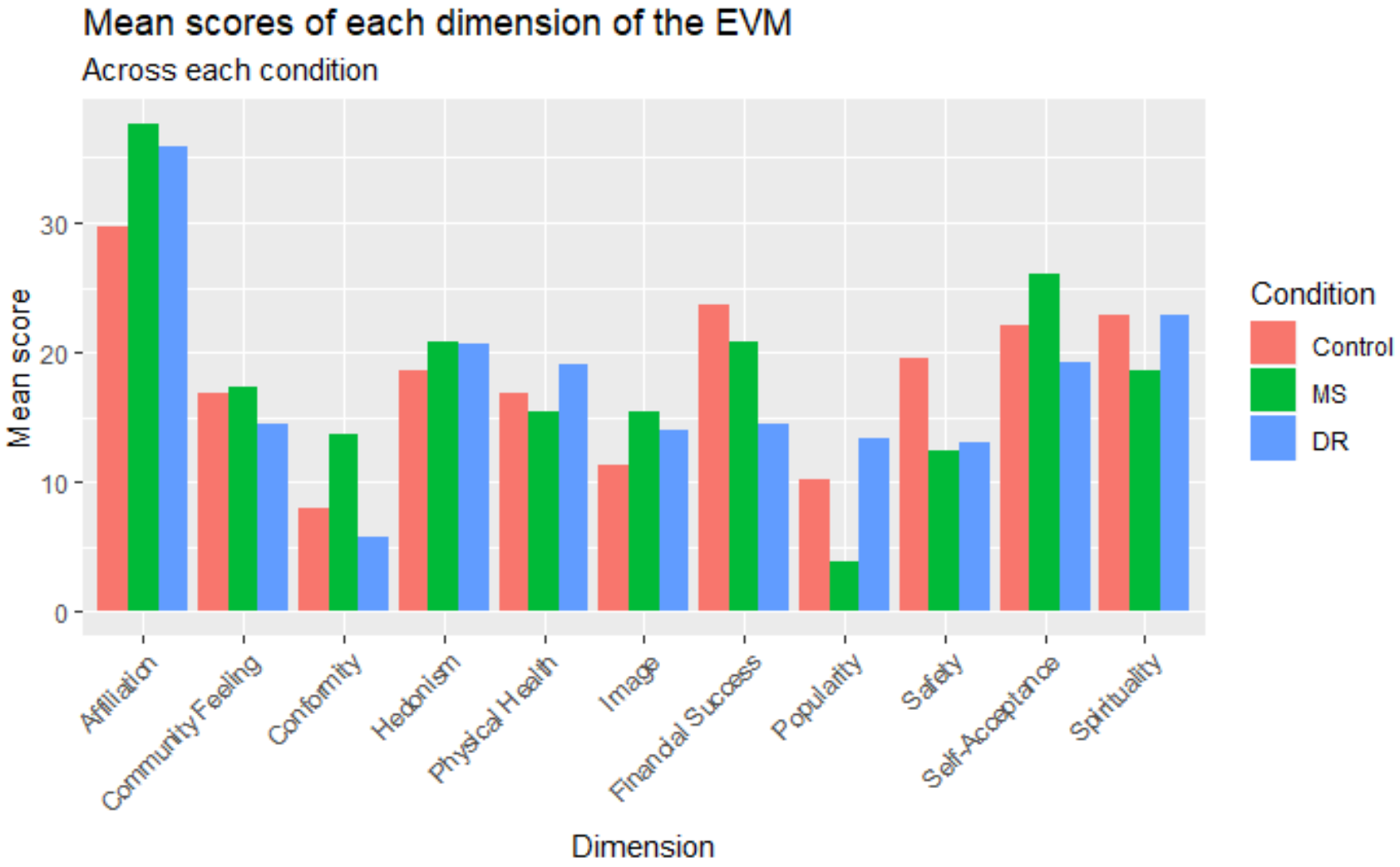
Mean scores of each dimension of the EVM
Across each condition
Mean score
30
20
10
0
Affiliation
Community Feeling
Conformity
Hedonism
Physical Health
Image
Financial Success
Popularity
Safety
Self-Acceptance
Spirituality
Dimension
Condition
Control
MS
DR

Figure 21

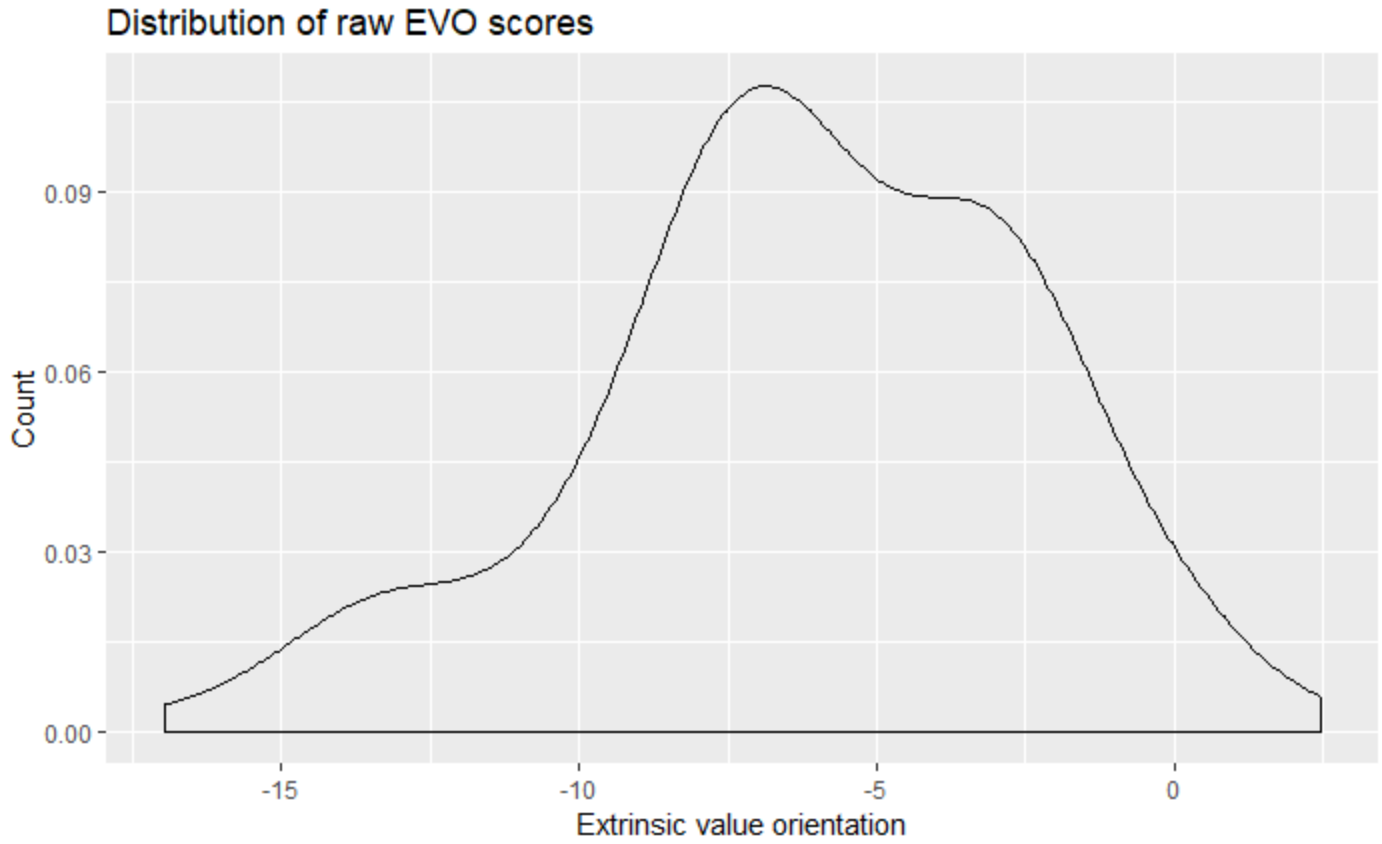
Distribution of raw EVO scores
Count
0.09
0.06
0.03
0.00
-15
-10
-5
0
Extrinsic value orientation

Figure 22

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APPENDICES

Appendix A

Death Reflection Prompt (Cozzolino et al., 2004)

Imagine that you are visiting a friend who lives on the 20th floor of an old, downtown apartment building. It's the middle of the night when you are suddenly awakened from a deep sleep by the sound of screams and the choking smell of smoke. You reach over to the nightstand and turn on the light. You are shocked to find the room filling fast with thick clouds of smoke. You run to the door and reach for the handle. You pull back in pain as the intense heat of the knob scalds you violently. Grabbing a blanket off the bed and using it as protection, you manage to turn the handle and open the door. Almost immediately, a huge wave of flame and smoke roars into the room, knocking you back and literally off your feet. There is no way to leave the room. It is getting very hard to breathe and the heat from the flames is almost unbearable. Panicked, you scramble to the only window in the room and try to open it. As you struggle, you realize the old window is virtually painted shut around all the edges. It doesn't budge. Your eyes are barely open now, filled with tears from the smoke. You try calling out for help but the air to form the words is not there. You drop to the floor hoping to escape the rising smoke, but it is too late. The room is filled top to bottom with thick fumes and nearly entirely in flames. With your heart pounding, it suddenly hits you, as time seems to stand still, that you are literally moments away from dying. The inevitable unknown that was always waiting for you has finally arrived. Out of breath and weak, you shut your eyes and wait for the end.

Appendix B

Death Reflection Questions (Cozzolino et al, 2004)

1. Please describe in detail the thoughts and emotions you felt while imagining the scenario.
2. If you did experience this event, how do you think you would handle the final moments?
3. Again, imagining it did happen to you, describe the life you led up to that point.
4. How do you feel your family would react if it did happen to you?

Appendix C

Word Search Distraction Task

Please find and circle the following words within the puzzle. Please inform the researcher when you are finished.

shoes skirt socks dress belt pants hat
cap necklace scarf vest coat shorts shirt
suit

g k a l a a f l c v e s t f e
r c a d u g a o s i w r p o e
a d y p g o s e k n e s g q o
c x e w a h c q i t f u s i z
s h o e s a r d r l o i h u o
x p q a l n b s t e f t o a s
s g s k j e s c r b h b r a n
o h c w c i r a v w o c t d h
e e i e s p e r d f x b s s i
n f e r s o p f u n e i t v t
a u l i t x c b i e o n u t a
u o g e o p a k g b a v z a o
o c e w b a h s s p r g o h c
t i k i p c s d r e s s x w o
e p f f f f j w t h k t r i a

SEN Teacher
senteacher.org

Appendix D

Greed measure instructions (Cozzolino et al., 2004)

Attention research participants! To thank you for participating in this somewhat personal research project, we have decided to enter each of you in a raffle! The winning participant will receive the $100 Amazon gift certificate pictured below. It can be used toward any purchase at the store (books, computer software and hardware, clothing, etc.). To avoid ethical concerns of potentially bribing participants, however, we the researchers (or our assistants) cannot play ANY role in the distribution of the raffle tickets, especially since we will be picking the winner. Based on past raffles like this, however, we have decided to let you—the participants—distribute the tickets amongst yourselves over time. In the top right-hand corner of this page is a "group number." Below are the instructions that pertain to each group.

If you are in GROUP 1, you are obviously in the first group!
Attached to the back of this page is an envelope filled with raffle tickets. Take what you consider to be a fair amount of tickets for yourself and leave the remainder in the envelope for future groups. Each ticket is a potential winner! Make sure you reattach the envelope to the packet!

If you are in GROUPS 2 or higher, open the envelope attached to this page and count the number of raffle tickets that remain. * Like the groups before you, you are free to take
as many tickets as you'd like, leaving those that you don't take for future groups. Remember, each ticket is a potential winner! Please reattach the envelope to the packet when you are finished.

Best of luck! Be sure to keep your ticket(s) since we will be picking the winner from those tickets that were distributed over the course of the semester. Any one of them could be the winner!

*If there are no tickets in the envelope: Since we are not tracking the distribution of tickets, you need to tell a research assistant that the envelope is empty. You will receive one ticket to maintain a chance of winning the prize.

Appendix E

Aspiration Index (Grouzet et al., 2005)

Instructions: This set of questions asks you about goals you may have for the future. Rate each item by circling how important each goal is to you. Then circle the chances that you will attain the goal. Try to use the entire scale when rating the items. That is, some of your answers will likely be at the lower end of the scale, some will be in the middle, and others will be at the higher end of the scale.

For brevity, only the items are provided below. Each item will be answered with the following two scales:

a. Importance of this goal:

1	2	3	4	5	6	7	8	9
not at all		a little		moderate		very		extremely

b. Chances of attaining this goal:

1	2	3	4	5	6	7	8	9
very low		low		moderate		high		very high

1. There will always be someone around to take care of me.
2. I will be efficient.
3. My image will be one other's find appealing.
4. I will find personal answers to universal spiritual questions (such as: Is there a supreme spiritual being? Is there life after death? What is the meaning of life?).
5. I will be in control of my emotions.

6. I will assist people who need it, asking nothing in return.

7. I will choose what I do, instead of being pushed along by life.

8. People will show affection to me, and I will to them.

9. I will feel energetic and full of life.

10. I will have few threats to my personal safety.

11. My life will be full of wine, lovers and song.

12. I will have many expensive possessions.

13. I will achieve the "look" I've been after.

14. I will be admired by many people.

15. I will be polite and obedient

16. I will have a great sex life.

17. I will have developed a code of ethics and/or morals to guide my life.

18. My basic needs for food, shelter and clothing will be met.

19. I will feel that there are people who really love me.

20. I will feel free.

21. The things I do will make other people's lives better.

22. My name will be known by many different people.

23. I will be in good physical shape.

24. Someone in my life will accept me as I am, no matter what.

25. I will follow my interests and curiosity where they take me.

26. I will find satisfying religious and/or spiritual activities.

27. I will live up to the expectations of my society.

28. I will deal effectively with problems in my life.

29. I will feel safe and secure.

30. People will often comment about how attractive I look.

31. I will feel good about my level of physical fitness.

32. I will be financially successful.

33. I will have a lot of excitement in my life.

34. I will not have to worry about bad things happening to me.

35. I will produce something of lasting worth.

36. I will find religious or spiritual beliefs that help me make sense of the world.

37. Most everyone who knows me will like me.

38. I will feel good about my abilities.

39. I will successfully hide the signs of aging.

40. I will be relatively free from sickness.

41. My desires and tastes will be similar to those of other people.

42. I will have enough money to buy everything I want.

43. I will express my love for special people.

44. I will find religious and/or spiritual beliefs that are growth-producing.

45. I will overcome the challenges that life presents me.

46. I will have insight into why I do the things I do.

47. I will help the world become a better place.

48. I will experience a great deal of sensual pleasure.

49. My life and actions will be in agreement with my religious/spiritual beliefs.

50. I will have a committed, intimate relationship.

51. I will have a job that pays well.

52. I will "fit in" with others.

53. I will be physically healthy.

54. I will have plenty of time to be lazy.

55. I will keep up with fashions in clothing and hair.

56. My surroundings will be stable and relatively unchanging.

57. People will really respect me.

Appendix F: R Packages Used

- **apaTables:** David Stanley (2018). apaTables: Create American Psychological Association (APA) Style Tables. R package version 2.0.5. https://CRAN.R-project.org/package=apaTables
- **car:** John Fox and Sanford Weisberg (2019). An {R} Companion to Applied Regression, Third Edition. Thousand Oaks CA: Sage. https://socialsciences.mcmaster.ca/jfox/Books/Companion/
- **dplyr:** Hadley Wickham, Romain François, Lionel Henry and Kirill Müller (2019). dplyr: A Grammar of Data Manipulation. R package version 0.8.0.1. https://CRAN.R-project.org/package=dplyr
- **devtools:** Hadley Wickham, Jim Hester and Winston Chang (2019). devtools: Tools to Make Developing R Packages Easier. R package version 2.0.2. https://CRAN.R-project.org/package=devtools
- **GGally:** Barret Schloerke, Jason Crowley, Di Cook, Francois Briatte, Moritz Marbach, Edwin Thoen, Amos Elberg and Joseph Larmarange (2018). GGally: Extension to 'ggplot2'. R package version 1.4.0. https://CRAN.R-project.org/package=GGally
- **ggplot2:** H. Wickham. ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York, 2016.
- **Hmisc:** Frank E Harrell Jr, with contributions from Charles Dupont and many others. (2019). Hmisc: Harrell Miscellaneous. R package version 4.3-0. https://CRAN.R-project.org/package=Hmisc
- **huxtable:** David Hugh-Jones (2019). huxtable: Easily Create and Style Tables for LaTeX, HTML and Other Formats. R package version 4.5.0. https://CRAN.R-

project.org/package=huxtable

- **interactions:** Long JA (2019). interactions: Comprehensive, User-Friendly Toolkit for Probing Interactions. R package version 1.0.0. https://cran.r-project.org/package=interactions
- **jtools:** Long JA (2019). jtools: Analysis and Presentation of Social Scientific Data. R package version 2.0.1, https://cran.r-project.org/package=jtools.
- **modelr:** Hadley Wickham (2019). modelr: Modelling Functions that Work with the Pipe. R package version 0.1.4. https://CRAN.R-project.org/package=modelr
- **mosaic:** R. Pruim, D. T. Kaplan and N. J. Horton. The mosaic Package: Helping Students to 'Think with Data' Using R (2017). *The R Journal*, 9(1):77-102.
- **olsrr:** Aravind Hebbali (2018). olsrr: Tools for Building OLS Regression Models. R package version 0.5.2. https://CRAN.R-project.org/package=olsrr
- **plyr:** Hadley Wickham (2011). The Split-Apply-Combine Strategy for Data Analysis. *Journal of Statistical Software*, 40(1), 1-29. http://www.jstatsoft.org/v40/i01/.
- **psych:** Revelle, W. (2018) psych: Procedures for Personality and Psychological Research, Northwestern University, Evanston, Illinois, USA, https://CRAN.R-project.org/package=psych Version = 1.8.12.
- **tidyverse:** Hadley Wickham (2017). tidyverse: Easily Install and Load the 'Tidyverse'. R package version 1.2.1. https://CRAN.R-project.org/package=tidyverse