

University of Central Florida

STARS

Honors Undergraduate Theses

UCF Theses and Dissertations

2022

Terror Management Theory During COVID-19: Individual Differences in Death Anxiety Defenses

Nicole L. Harkrider

University of Central Florida



Part of the [Psychology Commons](#)

Find similar works at: <https://stars.library.ucf.edu/honorsthesis>

University of Central Florida Libraries <http://library.ucf.edu>

This Open Access is brought to you for free and open access by the UCF Theses and Dissertations at STARS. It has been accepted for inclusion in Honors Undergraduate Theses by an authorized administrator of STARS. For more information, please contact STARS@ucf.edu.

Recommended Citation

Harkrider, Nicole L., "Terror Management Theory During COVID-19: Individual Differences in Death Anxiety Defenses" (2022). *Honors Undergraduate Theses*. 1145.

<https://stars.library.ucf.edu/honorsthesis/1145>

TERROR MANAGEMENT THEORY DURING COVID-19: INDIVIDUAL DIFFERENCES IN DEATH
ANXIETY DEFENSES

by

NICOLE LYNDAL HARKRIDER

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Psychology
in the College of Sciences
and in the Burnett Honors College
at the University of Central Florida
Orlando, Florida

Spring Term, 2022

Thesis Chair: Alvin Wang, Ph.D.
Thesis Committee Member: Daniel Paulson, Ph.D.

ABSTRACT

The present study seeks to determine the relationship between Terror Management Theory (TMT) and various measures of existential anxiety, future consciousness, and future-oriented thinking. By using TMT as a theoretical construct, a scale was devised to measure participants' protective behaviors relating to the COVID-19 pandemic. Three other scales were utilized, including Lalot's Future Consciousness Scale (FCS), Strathman's Consideration of Future Consequences Scale (CFCS), and Weems' Existential Anxiety Questionnaire (EAQ). The scales were combined into one composite survey along with demographic questions. 315 participants were then administered the collection of scales via an online survey platform. Results indicated strong significant correlations between the scale developed and the three other scales utilized. Multiple linear regression analyses revealed the three scales utilized were strong predictor variables of proximal and distal protective behaviors as predicted by TMT. The possibilities for future research include expansion of the knowledge regarding protective behaviors during widespread health issues, and how to design programs to maximize protective behaviors to minimize health risks.

DEDICATIONS

I would like to thank Dr. Alvin Wang for supporting me and guiding me through this analytical journey, and Dr. Daniel Paulson for overview, editing, encouragement, and advice. I would also like to thank my mom, dad, and partner for supporting me in my work and always believing in me at every twist and turn. This is for all of you.

ACKNOWLEDGMENTS

Great appreciation goes to UCF's Burnett Honor's College and all its personnel for walking me through the thesis process. This could not have been made possible without their never-ending support and wonderful staff. Another thank you is due to all my professors at UCF, for ensuring that my education was always the number one priority and for believing in me always.

TABLE OF CONTENTS

Table of Contents

ABSTRACT	2
DEDICATIONS	3
ACKNOWLEDGMENTS.....	4
TABLE OF CONTENTS	5
LIST OF TABLES	6
INTRODUCTION	7
Hypotheses.....	19
METHODS.....	21
Participants	21
Materials	21
Procedure.....	23
RESULTS	25
Analysis	25
Hypothesis Testing.....	26
DISCUSSION.....	31
REFERENCES	34
APPENDIX.....	37

LIST OF TABLES

List of Tables

1	Descriptive Statistics for CBS items 1 through 4 on the Proximal scale.....	26
2	Descriptive statistics for CBS items 5 through 8 on the Distal scale.....	26
3	Correlations for CBS Proximal subscale.....	27
4	Correlations for CBS Distal subscale.....	28
5	Correlations for Proximal subscale and the FCS, CFCS, and EAQ.....	29
6	Correlations for Distal subscale and the FCS, CFCS, and EAQ.....	30

INTRODUCTION

Research on the human reaction to death and mortality salience has relied heavily on Terror Management Theory (TMT) and the dual-process model originally proposed by Tom Pyszczynski (1999). The dual-process model of TMT states that individuals use proximal and distal defenses to alleviate the existential terror evoked by the thought of death relative to how near the thought of death is to the individual's consciousness (Pyszczynski, 1999). The same research by Pyszczynski (1999) details that when thoughts of death are present in one's consciousness and are the focus of the individual's attention, proximal defenses are activated. These defenses are logically related to the immediate threat of death, involving pushing the concept of death into the future by refuting one's vulnerability to events that could kill or by participating in behaviors that prolong one's life. In contrast, distal defenses are activated when thoughts of death are on the outskirts of one's consciousness, and act as a barrier, or buffer, to death anxiety (Pyszczynski, 1999). Literature on TMT asserts that this anxiety buffer uses one's "cultural worldviews, self-esteem, and close interpersonal relationships," to alleviate the fear of death by bolstering a person's commitment to the idea that he/she makes valuable contributions to the world around them which are both significant and permanent—continuing long after death" (Pyszczynski, 2021, p. 174). However, previous research has studied death anxiety primarily regarding proximal defenses, such as in situations of natural disasters, where the threat of death is imminent. Few studies have fully examined distal defenses, especially in

the present case of the COVID-19 pandemic where the threat of death is simultaneously both immediate (proximal) and subconscious (distal).

Since the start of the Coronavirus pandemic, death-related information such as the death toll, infection rate, economic downturn, hospitalizations, and social isolation has been increasingly available to the general public, not only through news and government announcements but through social media (Pyszczyński, 2021). Extensive coverage of the direct medical and economic consequences of the COVID-19 outbreak, as well as the social implications of the pandemic such as heightened violence, looting, protests, and social upheaval, have created a constant barrage of threats that are difficult to ignore. Pyszczyński et al also posit that this constant stream of information was consumed both directly through the seeking of updated information, but also indirectly. Specifically, it is suggested that constant visual reminders such as mask-wearing, COVID-19 regulation signage, and social distancing markers have become commonplace and are no longer actively processed, instead becoming an indirect, subconscious reminder of the proximity of infection, potential illness, and death. With death anxiety being present both in proximal (direct) and distal (indirect) forms, COVID-19 poses a unique, significant reminder of both the inevitability of death and one's vulnerability to it.

How these subliminal and constant reminders create differences in health-related behaviors, though, is largely unexplored. Furthermore, exploring the connection between personality traits and a preference for proximal versus distal defenses could explain how and why individual differences are observed in health-related behaviors.

An initial literature search revealed only a few studies investigating the correlation between individual differences in personality and the frequency of use of proximal versus distal defenses. Similarly, there is a dearth of literature attempting to predict response type across various groups. Research seeking to explore the relationship between Pyszczynski's dual-process theory and each defenses' impact on behavior has shown that death anxiety can influence a number of human behaviors, including driving performance (Taubman-Ben-Ari, Florian, & Mikulincer, 1999) and intent to buy various products (Dar-Nimrod, 2012). One study using three experiments examined the correlation between TMT and interpersonal behaviors revealed that groups primed with mortality salience were more likely to engage in virtuous or charitable behaviors than control groups, but only for participants who scored high on a measure of virtue (Ferraro, Shiv, & Bettman, 2005). Later studies have shown promise regarding the correlation between the level of self-talk and levels of death anxiety, reporting a significant relationship between one's level of self-talk and coping style which negatively correlated with levels of death anxiety in the current pandemic (Damitri, Mojarrad, Pireinaladin, & Grijibovski, 2020). Furthermore, a study among Turkish populations found a significant correlation between traits such as interpersonal sensitivity and religious affiliation; specifically, death anxiety seemed to decrease significantly amongst religious groups high in such traits (Erdoğdu, 2008). Consequently, research that reveals possible correlations between individual differences in personality and death anxiety could be vital to understanding the variations in behavioral responses to the COVID-19 pandemic.

Research surrounding the individual differences in reactions to mortality and death salience during times of great stress like the current pandemic, has supported the belief that TMT is influenced by interpersonal differences, as well as differences in type of mortality salience. One such study, relying heavily on Pyszczynski's dual-process model found that participants' initial reactions to the 9/11 terrorist attacks on the World Trade Center were mostly proximal and that distal responses typically followed in the time after the initial proximal response (Yum, 2004). Yum identified several prosocial behaviors associated with distal responses as detailed by Pyszczynski, including "altruistic [behaviors], intensified search for meaning/value, comforting, seeking/sharing information, relational investment, and counter-bigotry activism," which results showed "most people engaged in," in order to manage their fear of death (Yum, 2004, p. 2). The theory of indirect, distal responses to mortality salience has been supported in other studies, including McGregor et al. (1998), which linked mortality salience and aggression toward worldview opposition. Additionally, prosocial responses (bolstering one's worldview, engaging in charitable acts, and seeking meaning or comfort) have been supported by many aforementioned studies to be linked to mortality salience. Damitri (2020) reported mostly distal responses to the COVID-19 pandemic, which counters Yum's findings that showed mostly proximal initial responses.

In line with Pyszczynski's theory, differences in the order of response type are hypothesized to be influenced by the proximity of death. This would mean that covert mortality salience, as previously described in relation to the current pandemic could elicit a different response compared to overt mortality salience (such as during 9/11) where the inevitability of

death would have been the focus of individuals' consciousness. Additionally, COVID-19 has had much more longevity than the 9/11 attacks; COVID-19-related death salience has been prevalent for over two years at the time of this study, whereas the 9/11 attacks occurred in one day. Consequently, the amount of time mortality salience is present and the form (covert or overt) it takes is believed to relate to the type and order of proximal and distal responses. How these differences in responses occur in relation to personality remains largely unexplored. This is especially true regarding the COVID-19 pandemic, which presents an unprecedented amount of covert mortality salience spanning across years. Reminders of COVID-19 are ever-present in our society, whereas after 9/11 Americans were mostly no longer affected by mortality salience, as the threat of death was removed once the attack ended, and recovery began. In the case of COVID-19, the prevailing possibility of contracting and consequently dying from the virus creates a situation in which the threat of death is constantly on the fringes of one's consciousness, is no longer in the forefront of one's focus, and therefore is no longer seen as a proximal threat. This is believed to influence the response type used.

Existential anxiety as a result of mortality salience such as natural disasters and exposure to life-threatening situations such as COVID-19 can impact mental health greatly (Weems et al., 2016). Carl Weems' 2004 Existential Anxiety Questionnaire (EAQ) covers 13 items regarding thoughts of meaninglessness, emptiness, and guilt as they relate to one's life. Items on this scale include "I often think about death and this causes me anxiety," "I know that life has meaning," and "I often feel anxious because of feelings of guilt," (Berman, Weems, & Stickle, 2006). Weems cites Tillich (1952) in his 2016 work using the EAQ to assess existential

anxiety in adolescents exposed to Hurricane Katrina. Tillich covers three main categories of existential anxiety, each of which are comprised of “ultimate” and “relative” concerns (Weems, 2016, p. 466). Tillich’s first category, or domain, is anxiety about death and fate. This domain includes the ultimate concern of mortality, or death. It also includes the relative (by comparison) concern about fate—the concern of wanting to know our destiny which is ultimately unknowable. Tillich’s second domain covers concerns about meaninglessness and emptiness, particularly in relation to the idea that life may be without purpose and the loss of confidence in particular beliefs. His third domain covers concerns related to condemnation and guilt about one’s life not living up to perceived universal standards or one’s own personal expectations.

The EAQ was found in several studies to have strong predictability. Weems (2016) reported that the EAQ predicted preoccupation with thoughts of the meaning of life and death in adolescents exposed to traumatic stress, particularly in the aftermath of Hurricane Katrina. Those who were exposed to Katrina exhibited significantly greater anxiety about “fate, death, guilt, emptiness, and condemnation,” compared to those who did not experience Katrina (Weems et al., 2016, p. 471). It has also been reported that exposure to traumatic events may increase one’s preoccupation with existential concerns. As Pyszczynski and Weems postulate, traumatic experiences which give rise to existential anxiety (those which cause a concern of one’s own mortality), such as in the case of COVID-19, will differ in their response type. It is expected, then, that differences will arise; those who score higher on the EAQ will exhibit a more proximal response to the pandemic, as they are likely to be more concerned with creating

meaning and permanence in life. This is because, as Weems posits, questions surrounding the meaning of life and death may become “secondary to existence itself,” in these cases (Weems et al., 2016, p. 472). Further research into Weems’ EAQ revealed that existential anxiety is a concern for many. In fact, it was reported that Ninety-six percent of one sample of adolescents had at least one existential anxiety concern as reported by the EAQ (Berman, Weems, & Stickle, 2006).

The present study seeks to explore the relationship between personality constructs and death anxiety in order to predict individual responses to the pandemic. In so doing, it is believed that reactions to the pandemic are a result of individual differences which impact defenses against mortality salience. One possible difference is “future-oriented thinking,” (FOT) which will be the primary variable in this study. FOT will be assessed using the Consideration of Future Consequences scale (CFCS), which is a Likert-style scale consisting of 12 items relating to “potential distant outcomes of their current behaviors,” as well as the “extent to which they are influenced by these potential outcomes” (Strathman, Gleicher, Boninger, & Edwards, 1994, p. 743). Strathman posits that those who score low on the CFCS would be likely to put more emphasis on their “immediate, versus distant, needs and concerns, and are thus expected to act to satisfy these immediate needs,” whereas those scoring high are likely to “consider the future implications of their behavior and to use their distant goals as guides for their current actions,” (Strathman, 1994, p. 743). What this means is that those who are higher on the Consideration of Future Consequences scale are considered FOT’s (future-oriented thinkers)

and are hypothesized to be more likely to respond distally to the pandemic due to distal responses' connection with future-oriented problem solving as explained by Pyszczynski (2021).

Another individual difference that will be used in the present study is the Lalot and colleagues' (2019) Futures Consciousness scale (FCS) which measures a person's level of future-oriented thinking in terms of five different subscales: Time Perspective, Agency Beliefs, Openness to Alternatives, Systems Perception, and Concern for Others. This scale will be used to assess FOTs level of thought about the future and possible outcomes for future behaviors. Time Perspective (TP) highlights "long-term thinking," and the conscious awareness of the passage of time and the ability of a tomorrow as "basic prerequisites for being conscious about the future," (Lalot et al., 2019). It was found that TP was positively correlated with levels of *dispositional* mindfulness, which is more strongly related to future thinking than mindfulness itself, which focuses on the present moment (Lalot, Ahvenharju, Minkkinen, & Wensing, 2019). Agency Beliefs (AB) emphasize an understanding of the future as a consequence of the actions of "active agents," rather than being predetermined (Lalot et al., 2019). Openness to Alternatives (OA) is based in the belief that there are many possible outcomes for the future that can occur. OA is understood to be strongly related to being open to new experiences, but additionally shares ties with one's ability to "imagine or discover unconventional solutions," or outcomes to problems (Lalot et al., 2019, p. 5). Systems Perception (SP) is based in the understanding that there are many complex interrelations between the different social, cultural, and environmental systems in which they live (Lalot et al., 2019). Finally, Concern for Others (CO) is rooted in the idea that, to be considered future conscious, one must not only

show concern for one's own future, but also the futures of others, including future generations and society as a whole (Lalot et al., 2019). Each of these subscales has four to three items on the total 20-item Futures Consciousness scale. It is believed that this scale will correlate strongly with Strathman's Consideration of Future Consequences scale, as both are good predictors of participants' responses on questions requiring consideration of future outcomes and their impact on themselves and others. It is also believed that those scoring higher on certain subscales within FCS will be more likely to favor items on the COVID-19 Behaviors scale relating to distal responses, similar to those scoring higher on the CFCS. Subscales believed to correlate with distal responses include Time Perspective related to Strathman's CFCS, which "has been found to positively predict several long-term-oriented behaviours," (Lalot et al., 2019, p. 4). Other subscales include Openness to Alternative, which Lalot asserts demonstrates ability to find atypical solutions to problems and an "intolerance of uncertainty," (Lalot et al., 2019, p. 5). The other subscales, Agency Beliefs, Systems Perception, and Concern for Others are believed to correlate with proximal responses to the pandemic, in line with Pyszczynski's theory, as they demonstrate one's orientation to "a better global future," and are said to be independent of beliefs of a "predetermined future," (Lalot et al., 2019, pp. 4, 6). However, the cited works by Pyszczynski are exploratory in nature and did not directly investigate individual differences in proximal versus distal responses. It may be true that one could score high on one subscale and low on others and still exhibit a specific response type, as situational factors may impact the use of either response type.

In the present study, proximal and distal responses to the pandemic will be measured via a COVID-19 Scale (CBS) which is a Likert-style survey consisting of eight items related to engaging in certain behaviors since the pandemic began, whether proximal or distal. Items on the scale relating to proximal behaviors such as “I have washed my hands more frequently,” or “I have followed appropriate social distancing guidelines as recommended by the WHO and CDC,” are supported by Pyszczynski’s theory that proximal defenses against mortality salience can assuage the threat of death (Pyszczynski, 2020). As he states, proximal defenses in relation to COVID-19 are more adaptive, likely behaviors including following guidelines for “avoiding infection provided by the medical community.” (Pyszczynski, 2021, p. 178). However, these responses are not efficient in reducing death anxiety which stems from the “ultimate inevitability of death,” (Pyszczynski, 2021, p. 175). Therefore, it is expected that participants who score higher on items on the CBS relating to proximal responses would be likely to have low scores on Strathman’s CFCS, as those using proximal responses are seeking to quell the immediate threat of death rather than the inevitability of it. Those who score lower on the CFCS would be more likely to engage in protective behaviors related to COVID-19 such as mask-wearing, social distancing, and vaccination, which Pyszczynski (1999) asserts are related to proximal threats of death.

Items on the CBS relating to distal behaviors such as “I have spent more time practicing my religion,” or “I have spent more time with people who are important to me,” seek to relieve the anxiety caused by the knowledge that death is inevitable, and therefore bolster the belief that we “are valuable contributors to a meaningful life.” (Pyszczynski, 2021, p. 182). Distal

responses can involve engaging with various sources of symbolic meaning, fulfillment, significance, and interpersonal relationships. These distal defenses would not increase “the threat of contracting or spreading,” COVID-19 (Pyszczynski, 2021, p. 182). Some examples of this behavior would include discussing politics (CBS item six), involving oneself in philanthropic organizations (item eight), and practicing one’s religion (CBS item five) that can be done while following appropriate social distancing and safety guidelines. Therefore, it is hypothesized that groups which score higher on items relating to distal responses (CBS items five through eight) would be more likely to have higher scores on the CFCS. This is because behaviors that strengthens one’s self-esteem, cultural worldview, or interpersonal relationships, as supported by TMT, are not logically related to the threat of death itself, but instead are related to the threat of a meaningless and impermanent universe (Pyszczynski, 2021).

Pyszczynski asserts that proximal defenses are of little help when the threat of death is as great as in the current pandemic. The difference in response type (proximal or distal) then, is assumed to be logically related to individual differences in personality: those who score higher on the CFCS would be considered “future-oriented thinkers,” (FOTs) who are assumed to engage in a more distal response to the COVID-19 pandemic. FOTs seek to alleviate death anxiety by confirming their own belief in life’s meaning and longevity, leading to a distal response. Results favoring a correlation between FOT and the dual-process theory can be used to infer individual responses to the pandemic as they relate to TMT.

A study conducted by Ma & Ma (2021) attempted to predict participants’ intentions to receive the vaccination against COVID-19 and the seasonal flu by using Strathman’s CFC scale

which includes two subscales: CFCS-Immediate and CFCS-Future. The CFCS was used to separate future thinkers from immediate thinkers—those who consider future consequences and those who seek immediate results. Their study yielded significant results indicating that the CFCS is a strong predictor of intent to vaccinate against both the seasonal flu and COVID-19, predicting the outcome far beyond their control variables. The CFCS-Immediate scale negatively correlated with intentions to vaccinate against either ailment, whereas the CFCS-Future scale had a “significant positive effect,” on vaccination intent relating to COVID-19 specifically (Ma & Ma, 2021, p. 4). Their results suggest that those who score higher on the CFCS would respond distally to the pandemic by intending to receive vaccinations, but not actually receiving them. The intent to receive vaccination would be classified as a distal behavior, as it requires future-oriented thinking, planning, and situational thought. Receiving a vaccination in itself is a proximal response, as it requires no forethought or planning and is a direct response to the pandemic. Assuming that the CFCS and FCS show convergent validity, this would imply that those who score higher on certain constructs on the FCS would also respond distally. Ma and Ma’s study focused on vaccination intent and did not measure actual vaccination rates.

Under these circumstances, there may be a difference in number of participants who showed intent to vaccinate and the number of those participants who actually receive the vaccine. The present study hypothesizes that when used in conjunction with the COVID-19 behaviors scale, the CFCS will reveal that future-oriented thinkers (those scoring higher on the CFCS) will exhibit a distal response to the pandemic, as they are more concerned with the longevity of one’s own purpose in a meaningful universe than immediate healthy responses

which may also benefit others, such as mask wearing and social distancing. Those who score lower on the CFCS will be focused more on the immediate, and will be more likely to exhibit proximal responses, which can be adopted posthaste, in hopes of a quick return to normalcy. In conjunction, those who score lower on the CFCS are expected to respond more favorably on subscales on the FCS such as Openness to Alternatives and Time Perspective and are thus expected to exhibit higher proximal responses to COVID-19. The response disparity is supported within Lalot's FC scale; those higher in Concern for Others (as well as Systems Perception and Agency Beliefs) would be more likely to exhibit distal responses to the pandemic, as they are more likely to be concerned with a global future rather than a predetermined one.

Hypotheses

There are four main hypotheses within this study relating to the multiple scales and theories under study. They are as follows:

1. Strathman's CFCS will correlate with protective behaviors relating to COVID-19 as measured by the CBS.
 - 1a. Those scoring higher on the CFCS will exhibit distal responses to the pandemic.
 - 1b. Those scoring lower on the CFCS will exhibit proximal responses to the pandemic.
2. Lalot's FCS will correlate with protective behaviors relating to COVID-19 as measured by the CBS.
 - 2a. Those scoring high on measures of Openness to Alternatives and Time Perspective will exhibit proximal responses to the pandemic.

- 2b. Those scoring high on measures of Systems Perception, Agency Beliefs, and Concern for Others will exhibit distal responses to the pandemic.
- 3. There will be a correlation between Lalot's Futures Consciousness scale and Strathman's Consideration of Future Consequences scale.
- 4. Weems' Existential Anxiety Questionnaire (EAQ) will correlate with the CBS.
 - 4a. Those scoring higher on the EAQ will exhibit distal responses to the pandemic.
 - 4b. Those scoring lower on the EAQ will exhibit proximal responses to the pandemic.

METHODS

Participants

A questionnaire containing consent forms and all three scales was administered in Qualtrics to undergraduate General Psychology students at a large, metropolitan university in the southeast United States. This study was, prior to initiation, approved by the Institutional Review Board (IRB) (see Appendix). The 315 participants' mean age was 20 ($SD = 4.68$) years. The population sample was predominately white (46%) and female (54%). The majority (57.8%) of participants reported knowing someone who has been hospitalized but had not had COVID-19 themselves. While the questionnaire was anonymous, students who volunteered were given partial class credit. Data was collected over a four-month period from October of 2021 to February of 2022.

Materials

To measure participant's distal and proximal responses to the COVID-19 pandemic, we devised the CBS (see Appendix) which is an eight-item, Likert-style scale in which participants indicated the extent to which they agree or disagree (on a scale from 1 = "strongly disagree" to 5 = "strongly agree") with statements describing specific behaviors since the pandemic began. Items on this scale have been divided into two subscales: proximal and distal behaviors, with four items in each subscale. Proximal responders were identified by high scores (high agreeance) with items 1-4 relating to hand washing, social distancing, vaccination, and mask-wearing. Example items of this type of response include "I have washed my hands more

frequently,” and “I wear my mask every time I go into public spaces.” Distal responses were identified with high scores on items 5-8 relating to social engagement, religious affiliation, political involvement, and philanthropy. Example items for distal responses include “I have spent more time practicing my religion,” and “I have spent more time with people who are important to me.”

The second scale used in this study was Lalot’s (2019) Future Consciousness scale (FCS). This scale is also a five-point Likert-style scale in which participants marked to what degree each of 20 statements applied to them (from 1 = “not at all like me” to 5 = “very much like me”). As previously stated, this scale is comprised of five subscales. Example items from each respective subscale include: “I think about the consequences before I do something,” (Time Perspective); “I believe I can succeed at most any endeavor to which I set my mind,” (Agency Beliefs); “I often re-evaluate my experiences so that I can learn from them,” (Openness to Alternatives); “I have had the experience of feeling “at one” with nature,” (Systems Perception); “I believe in being loyal to all mankind,” (Concern for Others) (Lalot et al., 2019). Several items on this scale were reversely scored.

The third scale included for study was Strathman’s (1994) Consideration of Future Consequences scale (CFCS), which is a Likert-style scale in which participants indicate the degree to which they believe each of the 12 items describe them (from 1 = “extremely uncharacteristic” to 5 = “extremely characteristic”). Items on this scale relate to one’s ability to think about the consequences of present behavior as well as how much they are influenced by the potential outcomes. Example items include “I consider how things might be in the future

and try to influence those things with my day-to-day behavior,” and “I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.” (Strathman et al., 1994).

The fourth scale being used in this study was Weems’ (2004) Existential Anxiety Questionnaire (EAQ), which was modified into a Likert-type scale for this study. Participants again indicated on a scale how far they believe each of the 13 items on the scale apply to them (from 1 = “extremely uncharacteristic” to 5 = “extremely characteristic”). Items on this scale relate to feelings of existential dread and concern about death and the future. Example items include “I know that life has meaning,” and “I often think about death and this causes me anxiety,” (Weems, 2004).

Procedure

Participants were administered the survey via Qualtrics, an online survey administration platform. They were first asked to fill out a short questionnaire containing items regarding their demographic information and consent to participate in the study. Once participants volunteered, they were asked to continue to the main sections of the survey. The second section of the survey contained the CBS, consisting of eight questions. The third section contained the FCS with 20 items. The fourth section contained the CFCS with 12 items. Following this was a section for the EAQ which were the final 13 total items. Once they completed the survey, they were shown a message thanking them for their participation and were redirected to a page in which they could separately insert identifying information to receive partial credit toward their grade in class (this information was not recorded by the

researcher). Because all items were answered on a 5-point Likert scale, this survey took about 30 minutes to complete.

RESULTS

Analysis

The present study aims to determine whether proximal and distal behaviors can be predicted by scores on traits such as future consciousness and existential anxiety. Therefore, several correlations were run, and multiple ANOVAs were conducted to determine the relationship between variables. Regarding relationships, Pearson correlations were conducted using the CBS items 1 through 4 for the proximal responses, and items 5 through 8 for the distal responses. Scales that correlated with CBS measures were then included as independent variables in a multiple regression analysis with proximal and distal behavior scores serving as the dependent variables.

Relating to the internal consistency and reliability of the developed scale—The CBS—it was found that several items on the CBS, both proximally and distally, correlated with one another.

Descriptive statistics for the proximal subscale revealed that the average person was neutral, with slight agreeance ($M= 3.91, SD= .89$).

For the distal subscale, descriptive statistics revealed that the average person was neutral ($M= 3.31, SD= .64$). The number of participants listed below may be less than the total $N, 315$, because of missing data.

	Mean	Std. Deviation	N
CBS1	4.08	.92	312
CBS2	3.44	1.38	312
CBS3	3.79	1.11	312
CBS4	4.33	1.19	311
CBS_Prox	3.91	.89	311

Table 1- Descriptive Statistics for CBS items 1 through 4 on the Proximal scale

	Mean	Std. Deviation	N
CBS5	2.65	1.23	311
CBS6	3.40	1.17	311
CBS7	4.25	.74	312
CBS8	2.97	1.10	312
CBS_Distal	3.31	.64	310

Table 2- Descriptive Statistics for CBS items 5 through 8 on the Distal scale

Hypothesis Testing

Each of the four hypotheses tested were directional, and so 1-tailed tests were used with $\alpha < .05$. Because highly significant correlations were found in the initial correlation test, we conducted two multiple regression analyses using both the proximal and distal scales as the dependent variables for each analysis.

		CBS1	CBS2	CBS3	CBS4	CBS_Prox
CBS1	Pearson Correlation	1	.49**	.52**	.27**	.70**
	Sig. (1-tailed)		<.001	<.001	<.001	<.001
	N	312	312	312	311	311
CBS2	Pearson Correlation	.49**	1	.65**	.41**	.86**
	Sig. (1-tailed)	<.001		<.001	<.001	<.001
	N	312	312	312	311	311
CBS3	Pearson Correlation	.52**	.66**	1	.36**	.82**
	Sig. (1-tailed)	<.001	<.001		<.001	<.001
	N	312	312	312	311	311
CBS4	Pearson Correlation	.27**	.41**	.36**	1	.68**
	Sig. (1-tailed)	<.001	<.001	<.001		<.001
	N	311	311	311	311	311
CBS_Prox	Pearson Correlation	.70**	.86**	.82**	.68**	1
	Sig. (1-tailed)	<.001	<.001	<.001	<.001	
	N	311	311	311	311	311

** . Correlation is significant at the 0.01 level (1-tailed).

Table 3- Correlations for CBS Proximal subscale

		CBS5	CBS6	CBS7	CBS8	CBS_Distal
CBS5	Pearson Correlation	1	.09*	.18**	.20**	.66**
	Sig. (1-tailed)		.05	<.001	<.001	<.001
	N	311	310	311	311	310
CBS6	Pearson Correlation	.09*	1	.09	.05	.55**
	Sig. (1-tailed)	.05		.06	.19	<.001
	N	310	311	311	311	310
CBS7	Pearson Correlation	.184**	.089	1	.286**	.541**
	Sig. (1-tailed)	<.001	.06		<.001	<.001
	N	311	311	312	312	310
CBS8	Pearson Correlation	.20**	.05	.29**	1	.63**
	Sig. (1-tailed)	<.001	.19	<.001		<.001
	N	311	311	312	312	310
CBS_Distal	Pearson Correlation	.66**	.55**	.54**	.63**	1
	Sig. (1-tailed)	<.001	<.001	<.001	<.001	
	N	310	310	310	310	310
*. Correlation is significant at the 0.05 level (1-tailed).						
**. Correlation is significant at the 0.01 level (1-tailed).						

Table 4- Correlations for CBS Distal subscale

The inter-correlations between CBS items 1-4 and between CBS items 5-8 suggested high internal validity for both proximal and distal measures.

Based on these correlations, separate multiple linear regressions were performed to test if responses on the FCS, CFCS, and EAQ significantly predicted responses on both the proximal and distal scales of the CBS. The overall regression was statistically significant ($R^2 = .20, F(3, 300) = 25.06, p <.001$)

It was found that responses on Lalot's FCS significantly predicted responses on the distal scale of the CBS ($\beta = .73, p < .001$). Lastly, it was found that scores on the EAQ did not significantly predict scores on the CBS.

		CBS_Prox	FCS_Total	CFCS_Total	EAQ_Total
Pearson Correlation	CBS_Prox	1.00	.27	-.13	.24
	FCS_Total	.27	1.00	-.36	-.08
	CFCS_Total	-.13	-.36	1.00	.10
	EAQ_Total	.24	-.08	.10	1.00
Sig. (1-tailed)	CBS_Prox	.	<.001	.011	<.001
	FCS_Total	.000	.	.000	.08
	CFCS_Total	.011	.000	.	.04
	EAQ_Total	.000	.08	.04	.
N	CBS_Prox	305	305	305	305
	FCS_Total	305	305	305	305
	CFCS_Total	305	305	305	305
	EAQ_Total	305	305	305	305

Table 5- Correlations for CBS Proximal subscale and the FCS, CFCS, and EAQ

		CBS_Distal	FCS_Total	CFCS_Total	EAQ_Total
Pearson Correlation	CBS_Distal	1.00	.44	-.11	.06
	FCS_Total	.44	1.00	-.35	-.08
	CFCS_Total	-.11	-.35	1.00	.10
	EAQ_Total	.06	-.08	.10	1.00
Sig. (1-tailed)	CBS_Distal	.	<.001	.03	.16
	FCS_Total	.000	.	.000	.09
	CFCS_Total	.03	.000	.	.04
	EAQ_Total	.16	.09	.04	.
N	CBS_Distal	304	304	304	304
	FCS_Total	304	304	304	304
	CFCS_Total	304	304	304	304
	EAQ_Total	304	304	304	304

Table 6- Correlations for CBS Distal subscales and the FCS, CFCS, and EAQ

DISCUSSION

Regression analysis and correlation test results suggested support for our various hypotheses aside from hypothesis 4 (both 4a and 4b).

Hypothesis 1 was supported in that significant correlations were found between Strathman's CFCS and the CBS scale, both proximally and distally (that is $r(3, 301) = .384, p < .001$ and $r(3, 300) = .200, p < .001$ respectively). Hypotheses 1a and 1b were also supported; those who scored higher on the CFCS were likely to exhibit distal responses to the pandemic and those who scored lower were likely to exhibit proximal responses. This was because of the positive correlation between the CFCS and the CBS's proximal and distal subscales. Hypothesis 2 was supported in that the FCS did correlate with the CBS both proximally and distally (that is $r(3, 301) = .272, p < .001$ and $r(3, 300) = .436, p < .001$ respectively). Hypothesis 3 was supported in that the FCS and CFCS did correlate with one another ($r(3, 301) = -.357, p < .001$). Hypothesis 4 regarding the EAQ was not supported as it did not correlate with the CBS.

What is interesting about the results regarding the EAQ and its nonsignificant correlation with the CBS is that, based on the literature search, a significant positive correlation was expected. Further research on the EAQ and its relation to TMT and COVID-19 is necessary to determine why this correlation did not reach significance. Some avenues for this future research include investigating the various subscales on the EAQ and determining their correlation to actively engaging in protective, or distal, behaviors.

It is important to take into consideration the fact that limited participant demographics could have skewed the results of this study; many participants reported knowing someone who

had been hospitalized due to COVID-19, but only one reported having or being hospitalized due to COVID-19 themselves. This means that the majority of participants had not directly experienced COVID-19, and therefore may have a detached perspective of the virus which may have reduced the likelihood of engaging in protective behaviors. Additionally, the limited age range that was studied may have skewed results; different age populations may exhibit different responses due to unstudied variables. Despite this, we believe our overall results stand firm; that these various individual differences *do* predict scores on the CBS and therefore the likelihood of engaging in protective behaviors. This is because our hypotheses were supported by the data collected, leading us to suggest that engaging in protective behaviors is not contingent upon having experienced COVID-19 firsthand.

This research sought to expand the knowledge base of health and wellness, as well as the knowledge base of personality psychology by combining the reliable measurement of personality scales with theory on existential anxiety and how it relates to the current pandemic. This research can be used to further the investigation and will hopefully lead to the successful implementation of predicting and encouraging healthy behaviors.

Overall, the results of this study reveal promising avenues for future research. These include the ability to predict responses to future pandemics and epidemics. With this information, future researchers can determine how to gear health-related advertising to promote protective behaviors amongst groups who may not initially engage in those behaviors. It can be argued that these individuals are more at risk for contagion because of their lower likelihood of engaging in protective behaviors, so they should be greater encouraged by health

advertising to protect themselves and others. Another takeaway includes the generalizability of the study; it can be said that the individual differences studied in this paper could be applied to various public health concerns, including the spread of STDs and any future viruses and diseases. The COVID-19 Behaviors Scale can be applied to future research as well, in that it can be used with various measures of personality, or other variables (e.g., age and risk tolerance) to determine what factors influence the likelihood of an individual engaging in protective behaviors. These could be more rigid factors such as gender identity or age, or flexible ones such as empathy or altruism.

REFERENCES

- Berman S. L., Weems, C. F., & Stickle, T. R. (2006) Existential Anxiety in Adolescents: Prevalence, Structure, Association with Psychological Symptoms and Identity Development. *Journal of Youth and Adolescence* 35, pp. 285–292. <https://doi.org/10.1007/s10964-006-9032-y>.
- Damitri, E. S., Mojarrad, A., Pireinaladin, S., & Grijibovski, A. M. (2020). The role of self-talk in predicting death anxiety, Obsessive-Compulsive Disorder, and coping strategies in the face of Coronavirus Disease (COVID-19). *Iranian Journal of Psychiatry*, 15 (3), pp. 182-188.
- Dar-Nimrod, I. (2012). Viewing death on television increasing the appeal of advertised products. *Journal of Social Psychology*, 152, pp. 199-211.
- Erdoğdu, M. Y. (2008). Predicting death anxiety by psychological dispositions of individuals from different religions. *Erciyes Medical Journal*, 30 (2), pp. 84-91.
- Ferraro, R., Shiv, B., & Bettman, J. R. (2005). Let Us Eat and Drink, for Tomorrow We Shall Die: Effects of mortality salience and self-esteem on self-regulation in consumer choice. *Journal of Consumer Research*, 32, pp. 65-75.
- Lalot, F., Ahvenharju, S., Minkkinen, M., & Wensing, E. (2019). Aware of the Future? Development and Validation of the Futures Consciousness Scale. *European Journal of Psychological Assessment*. doi: 10.1027/1015-5759/a000565
- Ma, Z., & Ma, R. (2021). Predicting Intentions to Vaccinate against COVID-19 and Seasonal Flu: The Role of Consideration of Future and Immediate Consequences. *Health Communication*. doi: 10.1080/10410236.2021.1877913

- McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L. & Pyszczynski, T. (1998). Terror management and aggression: Evidence that mortality salience promotes aggression against worldview threatening others. *Journal of Personality and Social Psychology, 74*, 590-605.
- Pyszczynski, T., Greenberg, J., & Solomon, S. (1999). A Dual-Process Model of Defense Against Conscious and Unconscious Death-Related Thoughts: An Extension of Terror Management Theory. *Psychological Review, 106* (4), pp. 835-845.
- Pyszczynski, T., Lockett, M., Greenberg, J., & Solomon, S. (2021). Terror Management Theory and the COVID-19 Pandemic. *Journal of Humanistic Psychology, 6* (2), pp. 173-189.
- Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence For Terror Management Theory: I. The Effects of Mortality Salience on Reactions to Those Who Violate or Uphold Cultural Values. *Journal of Personality and Social Psychology, 57* (4), pp. 681-690.
- Strathman, A., Gleicher, F., Boninger, D.S., & Edwards, C.S. (1994). The Consideration of Future Consequences: Weighing Immediate and Distant Outcomes of Behavior. *Journal of Personality and Social Psychology, 66* (4), pp. 742-752.
- Taubman-Ben-Ari, O., Florian, V., & Mikulincer, M. (1999). The impact of mortality salience on reckless driving: a test of terror management mechanisms. *Journal of Personality and Social Psychology, 76*, pp. 35-45. doi:10.1037//0022-3514.76.1.35
- Thornson, J. A., & Powell, F. C (1992). A revised death anxiety scale. *Death Studies, 16* (6), pp. 507-521.

- Weems C. F., Costa N. M., Dehon C., Berman S. L. (2004). Paul Tillich's theory of existential anxiety: A preliminary conceptual and empirical examination. *Anxiety, Stress Coping An International Journal*. 17 (4), pp. 383–99.
- Weems, C. F., Russell, J. D., Niell, E. L., Berman, S. L., & Scott, B. G. (2016). Existential anxiety among adolescents exposed to disaster: Linkages among level of exposure, PTSD, and depression symptoms. *Journal of Traumatic Stress*. 29 (5), pp. 1–8.
- Yum, Y-O. (2004). Reactions to 9/11 as a Function of Terror Management and Perspective Taking. *Journal of Social Psychology*, 145 (3), pp. 265-286.

APPENDIX

COVID-19 Behaviors Scale

Please indicate the extent to which you agree or disagree with the following statements about your behaviors *since the pandemic began*:

1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly agree	
1. I washed my hands more frequently. (P)	1	2	3	4	5
2. I wore my mask every time I go into public spaces. (P)	1	2	3	4	5
3. I followed appropriate social distancing guidelines as recommended by the WHO and CDC. (P)	1	2	3	4	5
4. I received, or plan to receive as soon as possible a COVID-19 vaccination. (P)	1	2	3	4	5
5. I spent more time thinking about my religion. (D)	1	2	3	4	5
6. I think about politics more often (D)	1	2	3	4	5
7. I spent more time keeping in touch with people who are important to me. (D)	1	2	3	4	5
8. I became more interested in an organization that benefits others. (D)	1	2	3	4	5



EXEMPTION DETERMINATION

September 28, 2021

Dear Alvin Wang:

On 9/28/2021, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study
Title:	Terror Management Theory During COVID-19: Individual Differences In Death Anxiety Defenses
Investigator:	Alvin Wang
IRB ID:	STUDY00003385
Funding:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Form 254, Category: Consent Form; • Form 255, Category: IRB Protocol; • Questionnaire, Category: Survey / Questionnaire;

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Kamille Birkbeck
Designated Reviewer