Taste After Death: Is Candy Sweeter After Mortality Salience?

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Abstract

Terror Management Theory (TMT) postulates that humans use a variety of strategies in order to mollify and buffer our unconscious death anxiety (Burke, Martens, & Faucher, 2010). Food, specifically sweet items, have been proven to manage the terror of mortality salience, or at least blunt the usual behavioral responses following a reminder of one's death. In this study, proximal (immediate) defenses of mortality salience were tested through the use of a writing prompt and tasting candy samples. Participants either wrote about the feelings that arise when they consider their own death or about their next stressful exam. Following this, they sampled three types of candy: gummy, chocolate, or sour candy. We found no significant difference between candy preference; however, certain subgroups (women and freshmen) showed different rates of first-choice candies following death reminders. This study can provide further groundwork for other studies like it, exploring proximal defenses of mortality salience more in depth.

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Candy is one of the most prized, craved, and marketed food items on shelves. It is a quick way to sustain our need for food in a sweet delicious way, although it may be full of empty calories. But candy might have another function of which people are typically unaware. When encountered with stress or emotional trauma, we turn to sweets to console us. This may be because candy helps us manage our death anxiety.

Terror Management Theory (TMT) explains how much of our behavior, culture, and tradition is fueled by the avoidance of our inevitable death (Solomon, Greenberg, & Pyszcynski, 2015). This theory, based on the work of Ernest Becker (1973), hypothesizes that the realization of human mortality is at the root of everything socially human (Burke, Martens, & Faucher 2010). Much like other species of life on this planet, humans have an instinct to survive and thrive, but what sets us apart from other animals is our ability to mentally conceive our end (Solomon et al., 2015). This realization drives us to strengthen our sense of culture and indulge in self-esteem boosting activities (Solomon et al., 2015).

These indulgences may include the chocolates in the freezer. Though different aspects of terror management theory have been tested in various ways, by far the most common approach to examining the theory has been via the mortality salience (MS) hypothesis. In the typical MS study, participants complete a packet of questionnaires ostensibly for the purpose of assessing personality. However, embedded within this packet, participants are asked either to briefly write about their own death or about a non-death related (often negative) control topic (Burke et al., 2010). A specific aspect of their attitude or behavior is then measured. Many reviews underscore the wide array of behaviors that have been influenced by MS, covering such disparate domains as prejudice, tanning, sexual practices, having children, donating to charities, voting, and driving (Solomon et al., 2015). In order to understand where candy comes in, it is essential to unpack the two postulated types of death defenses.

Proximal defenses are the means by which people immediately avoid the concept of their mortality (Hirschberger & Ein-Dor, 2005). Proximal defenses will help people reduce, redirect, or temporarily avoid the conscious thoughts of death (Hirschberger et al., 2005). Distal defenses, on the other hand, are the deeper, more complicated means of denying death (Hirschberger et al., 2005). Most often, these distal defenses are symbolic and promote a sense of meaning or value within an individual (Hirschberger et al., 2005). Food has been used as both a proximal and distal defense in previous terror management research as delineated further below. There are four interrelated elements of food that promote its ubiquitous use as a death defense: (a) the biological soothing effects, (b) the reminder of care or nurturing aspect of food, (c) the traditional or cultural celebration of various foods as evolutionary success, and (d) the cognitive-behavioral distraction from direct threats (Hirschberger et al., 2005).

Two studies conducted in Switzerland tested two types of ingestion: Consumer preference and intake of a beverage (soda) and of food (chocolate) following the mortality salience (MS) priming (Friese & Hofman, 2008). Researchers in the beverage study presented a sample of a Swiss soda (Rivella) and an American soda (Dr. Pepper) after mortality salience; participants selected and sampled more of the Rivella (presumably to support national pride) as compared to the Dr. Pepper despite its higher popularity in Switzerland (Friese et al., 2008). In the food study, participants sampled a German chocolate and a Swiss chocolate after mortality salience (Friese et al., 2008). Much like the beverage study, the stated preference for Swiss chocolate was accentuated by the MS condition, although the amount consumed was not significant (Friese et al., 2008). Given these findings, researchers theorized that food can be used

as a distal defense and enforces our cultural worldview after mortality salience, which is a common finding within TMT (Solomon et al., 2015).

Alternatively, candy might function as a proximal death defense. When candy is consumed it can remind us of positive moments in our past, often correlated with comfort. An example of this might be the traditional lollipop after the doctor's office as a child. There have been several studies on the human relationship with food and the appeal of binge-eating as a proximal defense (Heatherton & Baumeister, 1991). This analysis uses escape theory to explain the impulsive behavior of binge eating, which is caused by the narrowing of the attention span to the immediate present and refusing meaningful thought (Heatherton et al., 1991). This thought-stopping strategy can be achieved through consumption of food, which often soothes the troublesome thoughts (Heatherton et al., 1991). TMT would argue that these troublesome thoughts could easily be a proximal defense to the cognitive awareness of death since it entirely distracts the consumer with the low-energy action of eating from their existential quandary.

There is also biological evidence of food, specifically sugar, being able to soothe unpleasant feelings. In a study conducted on crying infants, researchers found that a formula containing sucrose, or table sugar, when compared to water, nearly instantaneously calmed the child (Barr, Pantel, & Young, 1998). This study found that Aspartame, or the synthetic sugar found in many diet drinks, also substantially reduced the crying of the infant, but less so than the sucrose (Barr et al., 1998).

In light of the soothing effect of food and specifically sugar, another recent study sought to test the effect of eating as a buffer of MS when participants considered social transgressions (Hirschberger et al., 2005). The priming conditions were mortality salience versus the stress of a large exam, and the taste conditions included sweet candy, bitter candy, a cracker, or nothing. Researchers discovered that candy in general reduced the harsh ratings of the social transgressions, which are typical of TMT behavior, but the sweet candy had larger effects than the bitter candy did. In essence, candy really does help people manage their terror.

The preceding literature calls for more research on the relationship between food and TMT. The current study is an empirical investigation of how well food works as a proximal—immediate—defense against death anxiety. I hypothesize that mortality salience (MS) will cause participants to rate sweet candy more highly than chocolate or sour candy, and that more participants will select the sweet candy as their first choice of snack following a death prime (MS).

Methods

Participants

There were 56 college student participants, aged 18-25 (M=20.70, SD=3.104), from a Research Methods course and a Personality course at Fort Lewis College. Participants were 71.4% female and 53.6% Caucasian.

Materials

A demographic survey was the first page of the packet, followed by prompts for two different conditions; Appendix A shows the mortality salience prompt and the stressful exam prompt, comprised of two questions each (Cox & Arndt, 2006). Appendix B shows the instructions for the candy sample rating based on different characteristics: appearance, smell, flavor, texture, and sweetness. The scale for the candy rating was a scale from 1-4, 1 being awful and 4 being great. These scales were followed by two questions, asking whether or not the contestant enjoyed the candy and whether or not they would eat it again. There were three

different types of candy to sample—sweet (gummy), sour, and chocolate. There were also bland unsalted crackers offered to participants in between candy samples.

Procedure

Participants were provided the questionnaires and the candy samples and were prompted by the facilitator to complete the demographic information. Once finished, participants were able to move onto the second page, which consisted of the mortality salience or stressful exam prompts. Candy samples and crackers were distributed by the facilitator and participants were instructed to to select a candy to sample first and to ensure they identify the candy type on the rating page, then use the provided scales to rate the sweetness, appearance, smell, flavor, and texture of each candy sample. Participants were also offered a cracker following each sample to prevent flavor mixing. Once all participants were finished, questionnaires were handed into the facilitator. The study took about 20 minutes.

Results

The research hypothesis stated that sweet would be preferred over sour or chocolate candy following mortality salience (MS). A 2X3 ANOVA revealed that there were no statistically significant differences between the overall ratings of the sweet candy, the sour candy, or the chocolate candy in the experimental death condition, $F(1, 54) = 0.93$, $p = 0.761$. Further, we investigated which candy participants elected to sample first after receiving the experimental condition or the control condition. Table 1 below shows the first-choice frequency of each candy (chocolate, gummy, and sour) for each condition. We combined gummy and chocolate candy to define "sweet candy" and compared the first choice of participants of this new category to those in the sour category. When conducting a t-test comparing these categories, there was an overall trend indicating difference in first choice preference in the experimental condition, $t(54) = 1.88$, $p = 0.068$. Statistically significant differences were found in two specific demographic subgroups as shown in Figures 1 and 2 below. Women in the control condition demonstrated a similar first choice across all candies whereas women in the experimental (death) condition demonstrated a significantly higher first-choice rate of sweet candy as compared to sour candy, $t(38) = 2.27$, $p = 0.029$, as illustrated in Figure 1. Amongst college freshman, participants in the control condition demonstrated first-choice preference for sour candy over sweet whereas participants in the experimental condition elected sweet over sour candy to eat first following a death prime, $t(10) = 2.76$, $p = 0.020$ (See Figure 2).

Discussion

This study showed that candy does not taste sweeter after mortality salience, although people may expect it to. Women and freshman choose to sample sweet candy or chocolate rather than a sour candy following a death reminder. Our study extends the work of Heatherton et al. (1991), which explored the appeal of binge eating, by replicating the prompting of a stressful situation and allowing an individual to neglect or avoid meaningful thought through the consumption of food. When participants got to choose which candy to taste, they choose more often to consume a sweet-tasting candy but only when they were first reminded of their own mortality. We speculate that both the concept of eating candy and the actual chemical components of the sweet candy may have enabled it to function as a buffer against death anxiety. This cultural conditioning of sweets to manage stress allows candy itself to function as a proximal defense in many situations including mortality salience (Burke et al., 2010). The

question that remains unanswered by the current research is to what extent it can function as a distal defense (Burke et al., 2010)—i.e., a symbolic cultural investment.

Several limitations of our design are noteworthy. One mistake was that we shuffled the survey packets and assigned even amounts of each condition to each data collection period. We should have separated the conditions, conducting a session with the death condition only and another with the exam condition only. This would have eliminated any possibility of participant awareness of different conditions, although the assignment was random. Another possible limitation was the presentation of the candy. When researchers distributed the candy, it should have been after the completion of the writing prompts, not provided beforehand. As mentioned above, the concept of consuming candy could manage participants' fear of death, which potentially buffered the effects of mortality salience before or while the participants were responding to the prompt (e.g., Heatherton et al., 1991). Lastly, participants often created their own number on the candy sample scales, noting that there was not a neutral choice or that the scale was too small. This exclusion was intentional but using additional numbers or enlarged scale might have produced larger differences between the candies. These limitations open up options for further experimentation.

Researchers could replicate this study with changes to the details within the procedure. Specifically, they could remove one candy option, enlarge the scales, separate the conditions, and provide the samples after the completion of the writing prompts. This would allow the participant preference of candy to be clearer as well as avoid the tainting of the samples by allowing participants to know that their peers received different packets. Another study could tackle the question of the use of candy as a distal defense rather than as a proximal—immediate—death defense as explored herein. For instance, if a delay was used following the MS prompts and before candy tasting and selection, as is common in the TMT literature (Burke et al., 2010), then this research would have answered a different question: In addition to immediately soothing properties, does candy also help buffer death anxiety by its cultural and symbolic significance? Given the conditioning of candy and sweets to be comfort items, when combined with our study and the Swiss soda and chocolate study, the use of candy as a distal defense should be tested empirically (Friese et al., 2008; Solomon et al., 2015). The findings from these lines of research could lead to a deeper understanding of our consumption habits as people and might tell us more about the effectiveness of specific culinary products as proximal or distal death defenses.

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Appendix A

The Projective Life Attitudes Assessment

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR OWN DEATH AROUSES IN YOU.

_____
_____
_____
_____
_____
_____
_____

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU AS YOU PHYSICALLY DIE AND ONCE YOU ARE PHYSICALLY DEAD.

_____
_____
_____
_____
_____
_____
_____

The Projective Life Attitudes Assessment

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR NEXT IMPORTANT EXAM AROUSES IN YOU.

_____
_____
_____
_____
_____
_____
_____

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU IF YOU FAIL THIS EXAM.

_____
_____
_____
_____
_____
_____
_____

Appendix B

You are now participating in a taste test of various types of candies. Please be honest with your initial reaction to the flavor and texture of the candies and indicate which candy is sampled for each section. Sample as much as you would like, take your time, and ensure you provide a rating for all options. Ratings will be given on a scale from 1-4, 1 being awful and 4 being great.

Sample: _____

Sweetness:

1	2	3	4
Awful	Not good	Good	Great

Appearance:

1	2	3	4
Awful	Not good	Good	Great

Smell:

1	2	3	4
Awful	Not good	Good	Great

Flavor:

1	2	3	4
Awful	Not good	Good	Great

Texture:

1	2	3	4
Awful	Not good	Good	Great

Do you like this candy? YES NO

Would you eat this again? YES NO

Thank you for participating in this study. Please raise your hand when you have completed all samples. If you would like more candy you have the choice of any of the samples you've tried or Jolly Ranchers, take as much as you'd like and remain seated.

Appendix C

Informed Consent

Thank you for agreeing to participate in this research study about personality and values. Your participation is completely voluntary. If you choose not to participate, you can sit quietly in class during the experiment. You will be asked to fill out a questionnaire packet, which should take about twenty minutes to complete, in three parts including a short delay. There are no foreseeable risks to your participation. To protect your confidentiality, only aggregate data will be reported and no names will be collected. There is no direct compensation to you, though participants in some classes may receive course participation credit for being in class that day but that credit would be allocated regardless of whether you choose to participate in this study or not.

If you have any questions about this research or would like to know the results of the study, you may contact Dr. Brian Burke in the psychology department at 247-7088.

For questions about your rights as a research participant, contact Dr. Sarah Roberts-Cady at 247-7002.

If this research brings up any uncomfortable feelings, you may contact the Counseling Center at 247-7212, which offers up to 5 sessions free of charge.

Demographic Survey

Please circle **the one item that best describes you** for each question below:
1. My gender: Female Male Other / Prefer not to answer
2. The religious group I affiliate with most: Buddhist Muslim
Catholic Protestant Hindi Jewish Other None
3. How religious I am on a daily basis: Very Moderately Slightly Not Religious
4. I identify most with: Democrats Republicans Independents Other
5. My ethnic background:
Caucasian African American Hispanic American Asian American Native American Other
6. My current college status: Freshman Sophomore Junior Senior
7. My current age: _____
8. What is your favorite brand of candy? (Example: Smarties) _____

Table 1: Comparison of frequencies of participants' first choice of candy across both conditions

Condition	Chocolate (%)	Gummy (%)	Sour (%)
Exam	39.3	25.0	35.7
Death	46.4	39.3	14.3

Figure 1: Females in the Exam condition (left) demonstrated similar first choice preference as compared to females in the Death condition (right) who preferred sweet candy.

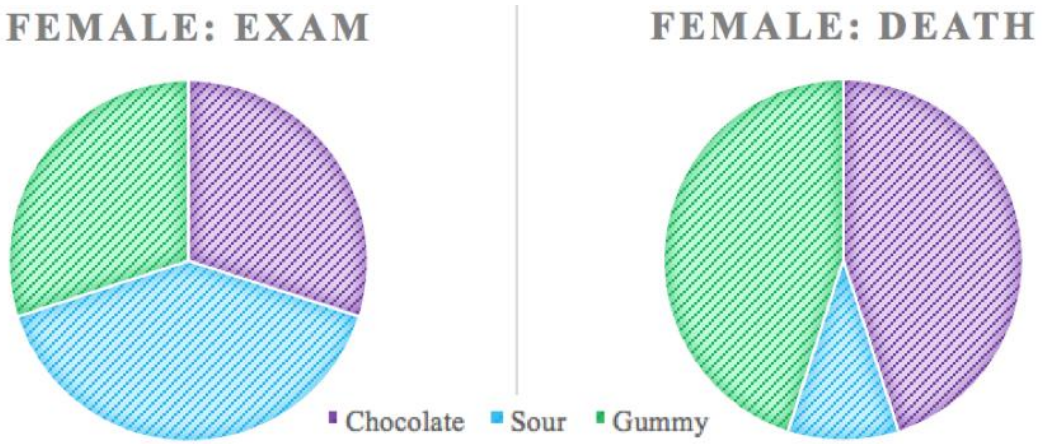

Figure 2: Freshman in the Exam condition (left) prefer sour candy, whereas Freshman in the Death condition (right) preferred sweet candy.