

Title: Specific Emotional Schema of Death-related Images vs. Unpleasant Images.

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Specific Emotional Schema of Death-related Images vs. Unpleasant Images.**Abstract**

Understanding the specific emotional responses elicited by death and how it differs with other unpleasant stimuli is essential for understanding people's behavior. In study I, 113 students viewed a set of unpleasant images or images of death. Death images rated lower arousal ($p = .020$, $d = .31$, CI [-.06 to .80]), and lower control ($p = .015$, $d = .68$, 95% CI [.23 to .93]) than unpleasant pictures. The results also indicated that, viewing death-related images did not induce a state of anxiety; in study II, 84 students (42 participants with prior experience related to death) viewed pleasant, neutral, unpleasant, and death images. The participants with prior experience reported lower arousal for death related images ($p = .004$, $d = .87$, 95% CI [.45 to 1.36]). In both studies, images of death induced a specific emotional schema according to Izard's theory that can be modulated by having previous experience.

Keywords: death, Anxiety, fear of death, emotional processing, images of death, unpleasant images.

Specific Emotional Schema of Death-related Images vs. Unpleasant Images.

Human emotions serve protective and adaptive functions since they are fundamental in the adaptive responses for survival or wellbeing (Izard, 2009). Facing the possibility of our own death elicits a distinct set of emotions in each individual (Schmidt Río-Valle, 2007). Nonetheless, little is known about the nature of these emotional responses.

Until now, the majority of studies suggest that anxiety is the characteristic emotional response that people experience when faced with the prospect of death (Neimeyer, 2005). However, fear and anxiety have been used as synonymous by some authors (Montoya-Juárez, 2006) leading to the development of numerous scales in the last decades (Neimeyer, 2005; Templer et al, 2006). Anxiety and fear are, strictly speaking, difficult emotional states to study differentially in a laboratory. For this reason, images have been used in many studies as research material since they may influence emotional states (Malcom, 2010; O'Neill, 2011) and provoke emotions and emotional states (Lang, Bradley, & Cuthbert, 2008). Besides, the image format allows researchers to control variables such as exposure time and intensity.

Paradoxically, death images do not necessarily provoke fear. In fact, some photos categorized as “human or animal threat” were rated as not fear-evoking, but rather anger. Likewise photos of natural threats and accidents do not evoke fear but rather sadness (Barke, Stahl, & Kröner-Herwig, 2012).

Nevertheless, recently new theoretical models of emotional processing, have been developed. Izard (2009) postulated the theory of the emotional system, made up of basic emotions that organize and motivate rapid actions that are critical for adaptation to immediate challenges as well as emotional schemas, the neuronal systems and mental processes involved in emotional feelings, perception, and cognition; these basic emotions and emotional schemas interact continuously and dynamically (Izard, 2009). These schemas are influenced by memories, thoughts, and images, among other factors (Izard, 1993). Therefore, the study of

the nature of the emotional response to death should include what type of basic emotions and emotional schemas are involved. In our opinion, the emotion schema related to death involves feelings, perception, and cognition under continuous and dynamic interaction with the basic emotion (fear) provoked by death stimuli. To date, only one study has considered this new theoretical model. Martí-García et al. (2016a) reported that images of death led to emotional responses that differ from responses to other unpleasant stimuli. These images were more pleasant than unpleasant stimuli and people responded more calmly and they controlled better emotions facing death images.

Finally, according to Izard's Theory (2009), other factors could impact the way we face death helping us to define the emotion schema related to death. For example, training or prior experience has a positive impact on students and professionals in palliative care clinical practice (Martí-García, García-Caro, Schmidt-Riovalle, Fernández-Alcántara, Montoya-Juárez, & Cruz-Quintana, 2016b).

The objectives of this research were (a) to determine if the emotional response that occurs when people face images of death can be interpreted as a state of anxiety or fear (Study I) and (b) to assess the role of previous experience in facing death (Study II). In order to answer these objectives, we hypothesized that (a) death emotional scheme is not a state of anxiety (general or specific) and, that the emotional response for death-related images would be different from those to the category of unpleasant (dissociated effect); and (b) having a previous experience of death will be associated to a different emotional processing.

Study I

The main goal of this study was to study the different emotional experience of death-related versus unpleasant pictures assessing the role of general anxiety, death anxiety and fear of death. The current design included two groups, one that visualized just unpleasant stimuli,

while the other visualized images of death, in order to avoid possible influences on the display of both stimuli.

Method

Participants

Initially, 121 students (103 women) at the University of Granada (Spain) participated voluntarily in this study without receiving any payment or other compensation in exchange. Criteria for inclusion: age between 18 and 35 years; free from any psychological disorder. A total of eight participants were excluded due to the second criteria. The final sample was 113 students (97 women) aged from 18 to 29 years ($M = 19.5$ $SD = 2.15$), with 68 participants viewing unpleasant images and 45 viewing death images.

Materials

Symptom Checklist 90 Revised (SCL-90-R) (Derogatis, 2002).

It is a measure composed of 90 items on a 5 point Likert scale that assess the level of somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism, where a high score means the possibility of having one of these disorders. The internal consistency coefficients for the 9 subscales ranged between .81-.90 (Derogatis, 2002).

Affective Pictures

We used 42 images, 21 from the International Affective Pictures System (IAPS) (Lang, et al., 2008) validated for the Spanish population (Moltó et al., 1999; Vila et al., 2001). They included unpleasant, very activating, and low dominance images from the Clinical Instrument for the Evaluation of Emotional Response (ICERE; Aguilar de Arcos, Verdejo-García, Peralta-Ramírez, Sánchez-Barrera, & Pérez-García, 2005). The 21 death images were obtained from various web sites and included (Martí-García et al., 2016a): cemeteries (4), cadavers (2),

sick persons (2), traffic accidents (3), explicit and implicit death threats (5), violent deaths (2), and scenes of mourning (3).

Self-Assessment Manikin (SAM; Bradley, Codispoti, Cuthbert, & Lang, 2001)

It is a tool to characterize subjective emotional experience. It uses pictures to evaluate 3 emotional dimensions: valence (pleasantness-unpleasantness), arousal (calm-excited), and dominance (control-no control). Valence and arousal are scored from 1 to 9, and dominance from 9 to 1, where 9 points indicate the highest degree of pleasantness, excitement, or control. We used the pen and paper version.

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, & Cubero, 1994)

It is a questionnaire composed by 40 questions on a 4-point Likert. Scores range from 20 to 80, with higher scores correlating with greater anxiety. Internal consistency coefficients for the scale have ranged from .86 to .95 (Spielberger et al., 1994).

Death Anxiety Scale (DAS; Templer, 1970; Tomás-Sábado, & Gómez-Benito, 2002)

It is an instrument composed by 15 yes-no questions, where higher scores indicate higher death anxiety. We used the Spanish version. Internal consistency of the DAS as determined by coefficient alpha was .83

Collett-Lester Fear of Death Scale (CL-FODS; Collett & Lester, 1969; Tomas-Sabado, et al., 2007)

It is composed by 28 questions scored from 1 (nothing) to 5 (much). It includes 4 subscales: death of self, one's own dying, death of other, and dying of another. The total internal reliability of the CL-FODS corresponded to 0.91 (Tomas-Sabado, et al., 2007)

Procedure

The participants were assigned to 2 different groups according to their preference regarding schedules. Subsequently, they completed the SCL-90-R and STAI-T. The image evaluation process was as follows: first, participants were given a response notebook for the

SAM. After explaining the task they had the opportunity to ask questions. We gave them 21 images, with the following format: a 2 second warning screen presenting the image number, the image for 6 seconds, and 20 seconds to evaluate the image in the response notebook before viewing the next image. All of the images were on a Pentium D computer using Microsoft PowerPoint 2007. Each image was in color and full-screen, in dimensions of 150cm x 200cm. The participants sat approximately 4 meters from the screen, and images were shown at approximately 50° of their visual horizontal and vertical angle. Next, students responded to the STAI-S, DAS, and CL-FODS. Sessions lasted approximately 1 hour and 30 minutes. All the responses were anonymous. At the end of the session, we gave them information about the psychology clinic at the University of Granada in case they had nightmares or flashbacks after viewing the images. No participant was excluded during the session.

Statistical Analysis

A descriptive analysis was performed for all images and categories (unpleasant and death) according to each of the emotional dimensions (valence, activation, and dominance). Student's T test for independent samples was used to determine whether there were differences in anxiety-trait between the two groups before viewing the images. Likewise, Student's T test was used to evaluate the effect of viewing different image categories (unpleasant versus death) for anxiety-state, death anxiety, fear of death and valence, activation and dominance responses. The level of statistical significance was established as $p = .05$ for all analyses.

Results

The two groups were not significantly different on the initial STAI-T. After seeing the images, they were not significantly different on the STAI-S, DAS, or any of the 4 CL-FODS subscales (See Table 1).

[Table 1 Here]

On the SAM, compared to those who viewed unpleasant images, those who viewed death images reported lower arousal, $t(111) = 2.32, p = .020, d = .31, 95\% \text{ CI} [-.06 \text{ to } .80]$, and lower control, $t(111) = 2.47, p = .015, d = .68, 95\% \text{ CI} [.23 \text{ to } .93]$ (See Table 1).

Study II

Method

Participants

We obtained 84 new undergraduate students in the same way as in Study I (68 women) with a mean age of 20.80 (SD = 1.57), including 42 participants with prior experience related to death. Previous experience consisted in having dealing with people in end-of-life processes for at least 1 month in inpatient units or at home as part of their clinical education and training at the university (healthcare careers).

Materials

SCL-90-R and SAM were the same as in Study I.

Visual Stimuli were 36 images, 15 pleasant, neutral, and unpleasant images from the IAPS, and the same 21 death images used in Study I.

Procedure

The process was the same as in Study I.

Statistical Analysis

As in Study I, descriptive analysis, followed by Student's T test for independent samples were carried out.

Results

Death related images reported lower arousal, $t(82) = -2.98, p = .004, d = .87, 95\% \text{ CI} [.45 \text{ to } 1.36]$, for the group with prior experience. Nonetheless, significant differences were

not observed between groups with respect to the unpleasant image category for any of the 3 SAM dimensions (See Table 2).

[Table 2 Here]

Discussion

The primary objective of this study was to determine if the emotional response that occurs when people face images of death can be interpreted as a state of anxiety or fear. Our results (Study I) indicate that viewing images of death did not induce anxiety, or a specific fear of death (Maxfield et al., 2007; Neimeyer, 2005; Templer et al., 2006), but a distinct emotional response. Moreover, our results (Study II) suggest the effect of prior experience on the emotional processing of death images, specifically with respect to the arousal they produced.

As we hypothesized, this emotional response was specific for images related to death. The results differed from those of unpleasant images with respect to arousal and dominance. In general, images of death scored as less activating and less dominated than unpleasant images. Our participant felt less nervous viewing death-related images but they had worse control in the emotion evoked. An explanation for these results could be that images of death elicit a different emotional response than unpleasant images included in the IAPS.

It is possible that the context of death is related to a unique mental state (emotional and apparently also neurological) (Han, Qin, & Ma, 2010) influenced by cultural factors which try to keep everything related to death in a place away from the awareness (Greenberg, Pyszczynski, & Solomon, 1986) or in interaction with cognitive processes that provide meanings that regulate the emotion schema (Izard, 2009).

An alternative explanation to the less emotional control for the response to images of death could be the age of participants. Although, to the best of our knowledge, there is no scientific literature specifically addressing the emotions related to images of death, there are

studies that demonstrate how attitudes about death and the ways in which people defend themselves against death may change with age (Burke, Martens, & Faucher, 2010). Likewise, youth has been related to a lack of contact with the end of life and the way in which this reality is denied, turning it into a social taboo (Gesser, Wong, & Reker, 1987). It has also been proposed, in contrast, that with age, death takes on greater importance as a potential problem. Nonetheless, it appears that older people might arrive at a greater acceptance of death, which would render it a lesser threat (Maxfield et al., 2007).

On the other hand, the differences in levels of activation between the two types of images may be consistent with the Terror Management Theory's hypothesis, which proposes the existence of a "buffer" to control the possible anxiety elicited by the thoughts of our own death. This buffer that acts against awareness of death, could induce greater accommodation of these stimuli and thus less arousal. Studies based on this theory, often elicit thoughts about our own death comparing with a control group in which other unpleasant thoughts as those related to dental pain are elicited. In this sense, it is significant that death-related thoughts have a unique defensive response (Hayes, Schimel, Arndt, & Faucher, 2010).

Regarding the role of previous experience of death, previous research have demonstrated how, after training, nursing students cope better with death, perceiving best self-competencies (Schmidt-RíoValle, 2007), suggesting that prior experience reduces the sense of damage or threat from images of suffering and improves the emotional response regarding images of death. When the image shows people explicit suffering, it results in a higher arousal and less dominated emotions.

The clinical implications of the present study are related to the need of knowing the emotional response to the death of patients at the end of life to justify the necessary therapeutic interventions that could be modulated by previous experience, cultural factors, or others factors that should be investigated in the future. It can be said that people is not afraid

of death but is afraid of the way they can die. And understanding the pain and suffering of a person who is facing death can change completely the care we need to bring them.

Finally, these results are congruent with how Izard (2009) defines and describes emotion schemas as dynamic interactions between emotion and cognition influenced by individual differences, learning, and the cultural and social context.

The present study has as main limitation the specific characteristic of the sample (mostly young women, with higher educational level). Furthermore, it will be necessary to investigate the effect of other variables, such as beliefs, ethnicity, age, etc., to delimit the emotional schema of death. Future studies should investigate the effect of other variables (such as beliefs, ethnicity or age) in the emotional schema of death, and determine the physiological correlates involved in in specific population such as bereaved people.

In summary, our results indicated that there is a specific emotion schema toward death. This schema seems to be modulated by previous personal experiences related to death.

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Table 1. Anxiety and Fear according to the type of image (unpleasant vs. death) and Means and Standard Deviations of SAM, Study I

| Variables | Unpleasant images (n=68) | | Death images (n=45) | | <i>t</i> | <i>p</i> | <i>d</i> | |
|-----------|-----------------------------|-------|------------------------|-------|----------|----------|----------|-----|
| | Mean | SD | Mean | SD | | | | |
| STAI-T | 18.80 | 10.20 | 21.50 | 9.63 | -1.41 | .163 | .27 | |
| STAI-S | 19.20 | 9.32 | 21.0 | 11.11 | -.935 | .352 | .18 | |
| DAS | 6.50 | 1.94 | 6.40 | 1.76 | .257 | .797 | .05 | |
| | 1 | 23.30 | 7.15 | 23.60 | 6.06 | -.190 | .850 | .05 |
| Collet- | 2 | 23.50 | 6.36 | 24.60 | 4.76 | -.924 | .358 | .19 |
| Lester | 3 | 27.50 | 4.97 | 27.40 | 5.07 | .141 | .888 | .02 |
| | 4 | 24.40 | 6.01 | 26.0 | 4.25 | -1.59 | .114 | .30 |
| SAM | | | | | | | | |
| Valence | | 2.51 | .69 | 2.59 | .66 | -.569 | .571 | .12 |
| Arousal | | 6.76 | 1.35 | 6.39 | .97 | 2.322 | .022 | .31 |
| Dominance | | 4.46 | .74 | 3.88 | 1.03 | 2.468 | .015 | .68 |

Note: Collet-Lester includes four subscales; 1. Death of Self; 2. Dying of Self; 3. Death of Others; 4. Dying of Others. SAM = Self Assessment Manikin

Table 2. Means and Standard Deviations. Results of the Analyses of the Emotional Categories (Unpleasant vs. Death – Previous Experience vs. Non P.Experience). Study II

| SAM | Previous Experience (n=42) | | Non previous Experience (n=42) | | <i>t</i> | <i>p</i> | <i>d</i> |
|------------|-------------------------------|------|-----------------------------------|------|----------|----------|----------|
| | Mean | SD | Mean | SD | | | |
| Unpleasant | | | | | | | |
| Valence | 1.80 | .91 | 1.70 | .88 | -.554 | .581 | .11 |
| Arousal | 7.40 | 1.10 | 6.80 | 1.90 | -1.735 | .086 | .39 |
| Dominance | 4.40 | 2.30 | 4.10 | 2.10 | -.511 | .610 | .14 |
| Death | | | | | | | |
| Valence | 2.30 | .78 | 2.40 | .81 | .410 | .683 | .13 |
| Arousal | 6.30 | 1.0 | 5.40 | 1.10 | -2.977 | .004 | .87 |
| Dominance | 5.10 | 1.90 | 5.30 | 1.90 | .532 | .596 | .11 |

Note. SAM = Self Assessment Manikin