Imagine yourself on a safari tour, standing in open African grasslands. All of a sudden, a lion appears out of nowhere, and the carnivore strikes a threatening pose. Now, would you prefer this to be a large group safari, with say 30 other people standing close together, or an adventurous trip with only one friend? Research suggests that you would probably prefer it to be a group safari.

In times of threat, humans generally seek shelter in large and dense crowds. Likewise, when anxious, people seek affiliation (Schachter, 1959). One of the key elements contributing to why people prefer to be in groups in times of terror and threat is that these groups have the potential to protect their members (Buss, 1995). Throughout history, groups have proven to increase the survival rate of human beings. Not only do they protect their members against immediate threats such as predators, they also improve the survival rate of their members in the long term by gathering food and offering shelter. In the present day and age, people continue to prefer to be close to others when threatened, even when there is no apparent physical threat (see Baumeister & Leary, 1995; Bowlby, 1969).

Below, we propose that the preference for both large and cohesive groups is so basic and fundamental that even abstract configurations of groups of (relatively meaningless) geometric figures make people feel safer when mortality is salient. We argue and demonstrate that these abstract representations may help to buffer the potential fear that may otherwise arise in threatening and uncertain situations. In showing that representations of large and cohesive groups make people feel safer, we suggest that these basic and abstract features aid in coping with existential fear beyond culture and established (in)groups.

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5 This chapter is based on Renkema, Stapel, & Van Yperen (2009).
In everyday life, people are constantly reminded that death is inescapable. The magnitude of these reminders may vary greatly, from passing by a funeral home to witnessing an earthquake or tsunami that has killed thousands of people. Despite the fact that these reminders may differ in impact, essentially they all remind people that their life on earth will end one day, rendering them to dust. One of the most researched theories in Social Psychology today, Terror Management Theory (TMT, Solomon, Greenberg, & Pyszczynski, 1991; Solomon, Greenberg, & Pyszczynski, 2004), is one that deals with the consequences of mortality salience on people’s emotions, cognitions, and behaviors. According to TMT, reminders of being a mortal creature will trigger a set of defensive mechanisms that buffer the anxiety caused by this existential threat (see Pyszczynski, Greenberg, & Solomon, 1999).

Two defensive mechanisms are at the core of TMT: (a) the cultural worldview, that is, a stable conception of reality that gives meaning to the social environment, and (b) self-esteem, that is, a sense of self-worth, and thus the feeling of being a valuable contributor to the social environment. The effectiveness of these buffering mechanisms has been demonstrated in hundreds of studies conducted worldwide throughout the past decades (Solomon et al., 2004). Groups often play a central role in these studies, mainly because of their impact on people’s cultural worldviews. Accordingly, it has been found in a number of TMT studies that, when mortality is salient, people evaluate their own ingroup more positively and outgroups more negatively (for example, see Greenberg et al., 1990; Florian & Mikulincer, 1997).

**TMT and Groups**

Like most primates, humans have a tendency to live in groups. Groups ensure physical protection, supply the resources necessary to survive, and provide psychological protection. Even in present times, where many western cultures are
characterized by individualism, people continue to benefit from group life in various ways. For example, groups are a source of self-esteem and psychological assurance, often derived from a shared identity or culture (Tajfel & Turner, 1986). The cultural worldview is in part derived from the group one belongs to, and it is one of the defensive mechanisms that play a central role in TMT. Affirming the cultural worldview has been shown to protect people from experiencing mortality-related anxiety, by providing a stable, structured, and coherent view on the world (Schmeichel & Martens, 2005). Thus, when confronted with their own mortality, people are motivated to defend, affirm, and justify their outlook on the world. Groups often provide this function.

In the present research we aimed to go beyond the often-researched cultural worldview hypothesis, by demonstrating that the togetherness and cohesiveness of a group can buffer existential fear and make people feel safer. We argue that, when mortality is salient, the need to be a part of a group is so basic that even abstract representations of groups offer a terror-managing function. Our aim in the current set of studies was to show that, when people are confronted with their own mortality, figures that resemble large and cohesive groups make them feel safer, even when these pictures represent abstract non-human figures that only symbolically represent togetherness and cohesiveness. We tested this hypothesis using abstract figures to show that size and cohesiveness have an impact on people’s perceived safety without influence from any other preexisting (inter-)group characteristics. This is an important contribution to the extant literature, because it provides insight into the terror-managing effect of basic group characteristics in threatening situations, outside a specific cultural context.

Our hypothesis might, perhaps, seem odd to some. How can abstract figures such as squares and male or female avatars (see Figures 4.1 and 4.2) validate one’s worldview or boost one’s self-worth? We suggest that the terror-managing function of large, cohesive groups is so basic and fundamental that even symbolic representations that remind people of such groups may make them feel
safer when mortality is salient. People are known to attribute human features to abstract figures and objects, such as emotions and traits (e.g., Michotte, 1963). These features, consequently, have the ability to comfort people, and make them feel safer. Large groups provide safety in numbers, and cohesive groups signal affiliation; these are two constructs that may act as helpful buffers against mortality-induced anxiety (see Mikulincer & Florian, 2003; Wisman & Koole, 2003). As shown by Wisman and Koole (2003), when mortality is salient, people prefer to be in a group rather than alone. Similarly, the findings of recent studies have shown that people yield more easily to the aesthetic preferences and political attitudes of the majority when mortality is salient, compared to when it is not (Renkema, Stapel, & Van Yperen, 2009).

In the present research, we tested the terror-managing function of groups to a symbolic limit by investigating whether simplified, abstract representations of groups may also serve terror-managing functions. Thus, we tested the prediction that – because groups provide safety and cohesive groups signal affiliation – when reminded of their own mortality, people see figures that resemble large and cohesive groups as being safer, even when these figures consist of non-human stimuli.

**Study 4.1**

In Study 4.1, participants were asked to indicate for a series of figures, each consisting of a group of male and female avatars, in which group they felt safer. The figures differed in number of avatars, and in how close to each other these avatars were. According to our hypothesis, mortality salience should make participants feel safer in a larger and more cohesive group. We predicted that a representation of such a group, compared to the control conditions, would make participants feel safer.
Method

Participants and design

The participants were 55 undergraduates, who took part for course credit. They were randomly assigned to one of the three experimental conditions (mortality salience vs. television vs. dental pain).

Procedure and material

Upon entering the laboratory, participants were asked to fill out a booklet containing three ostensibly unrelated studies. Mortality salience was manipulated in the first study where the participants had to answer an open-ended question concerning their own death (adopted from previous TMT research, e.g., Greenberg et al. 1990). In the mortality salience condition, the participants were asked, “Please briefly describe the emotions and thoughts that the thought of your own death arouses in you.” In the control conditions, participants had to answer a parallel question concerning “watching television” or “dental pain”. The dental pain condition is often used as an extra control condition in TMT research (e.g., Arndt, Greenberg, Schimel, Pyszczynski, & Solomon, 2002) to control for the alternative explanation that the effects of mortality salience could be due to general fear induction. After the participants had finished the task, they were asked to continue with the second study. The second task was an unrelated filler task in which the participants had to complete an easy word-unscrambling task. When the participants had completed the filler task, they were instructed to continue with the third and final part of the experiment, which included the dependent measures.

Dependent measures. The so-called third study was briefly introduced as an impression-formation task. Each participant was presented with four figures, each consisting of a set of human avatars which differed in number (8 vs. 2) and cohesiveness (close vs. distant, see Figure 4.1). In the middle of the figure a
question mark was placed, indicating the spot where the participant would be located. For each of the figures, the participants had to indicate on a 9-point scale, ranging from 1 (not at all) to 9 (very much), how safe they would feel safe in that particular spot. Once the participants had finished the last part of the experiment, they were thanked for their participation and carefully debriefed. None of the participants reported that they were aware of the purpose of the study, or suspected that the two parts of the experiment were actually related.

Figure 4.1 - Figure consisting of human avatars.
Results and Discussion

In order to test for our hypothesis, we contrast coded the effect of Mortality salience, with a weight of ‘2’ applied to the mortality salience condition and a weight of ‘-1’ applied to the two control (i.e., dental pain and control) conditions. We also contrast coded the effect of Figure type, with a weight of ‘3’ applied to the large and cohesive figure condition and a weight of ‘-1’ applied to the three other figure conditions. Both contrasts did not yield significance, $F(1, 52) = 2.26, p = .14$ and $F(1, 52) = 2.26, p = .29$ respectively. However, in line with predictions, we obtained an interaction between these two contrasts, with large and cohesive figures increasing more feelings of safety (relative to the other figures) in the mortality salience than in the two control conditions, $F(1, 52) = 14.63, p < .001, \eta^2 = .22$.

Complementary analyses confirmed that there was an effect of mortality salience $F(2, 52) = 8.92, p < .001, \eta^2 = .26$ on how safe people felt in the group with more avatars close together (see Figure 1A). Simple contrast analyses showed that participants in the mortality salience condition indicated that they would feel safer ($M_{\text{mortality}} = 7.72, \text{SD} = .83$) compared to participants in the two control conditions ($M_{\text{tv}} = 5.65, \text{SD} = 1.46, F(1, 52) = 13.91, p < .001, \eta^2 = .21$ and $M_{\text{dental pain}} = 5.80, \text{SD} = 2.24, F(1, 52) = 12.93, p < .001, \eta^2 = .20$). We found the opposite effect on perceived safety for the figure with fewer avatars far apart from each other (see Figure 1D), $F(2, 52) = 4.89, p < .01, \eta^2 = .16$. Simple contrast analyses showed that participants in the mortality salience condition indicated that the figure made them feel less safe ($M_{\text{mortality}} = 4.61, \text{SD} = 1.91$) compared to participants in the two control conditions ($M_{\text{tv}} = 6.00, \text{SD} = 1.23, F(1, 52) = 8.16, p < .01, \eta^2 = .14$ and $M_{\text{dental pain}} = 5.80, \text{SD} = 1.06, F(1, 52) = 6.48, p = .01, \eta^2 = .11$). No differences in perceived safety were found for the other two figures, $Fs < 1$.

In addition, simple contrast analyses showed that participants in the mortality salience condition indicated that Figure 1A made them feel (marginally)
safer ($M_{1A} = 7.72, \ SD = 0.83$) compared to Figure 1B ($M_{1B} = 6.94, \ SD = 1.43, F(1, 52) = 3.15, p = .08, \eta^2 = .06$, Figure 1C ($M_{1C} = 6.33, \ SD = 1.72, F(1, 52) = 9.99, p < .01, \eta^2 = .16$ and Figure 1D ($M_{1D} = 4.61, \ SD = 1.91, F(1, 52) = 49.92, p < .001, \eta^2 = .49$).

In line with our expectations, these findings show that the number of items a figure consists of and how close together these items are, has a significant effect on how safe people under conditions of mortality salience, relative to both control conditions. This suggests that mortality salience is likely to activate a need to belong to large and cohesive groups. In contrast, participants indicated that the figure that consisted of the fewest avatars, which were placed further away from each other, made them feel less safe when mortality was salient, compared to the control conditions.

**Study 4.2**

In the first study, we used rather abstract figures. It was clear, however, that these figures represented a group of human avatars. Study 4.2 was designed to show that, following mortality salience, people prefer figures that resemble large and cohesive groups, even when these figures consist of non-human stimuli. Our rationale is that the need to be part of large, cohesive groups is so strong that it may even manifest itself in a preference for abstract geometric representations of such groups. To test this hypothesis, participants were asked to indicate for a series of figures consisting of several squares, how safe these figures made them feel. The figures differed in number of squares, and how close these icons were to each other. We predicted that the larger and more cohesive group of squares would make participants feel safer under the condition of mortality salience compared to the control conditions and other representations.
Method

Participants and design

The participants were 45 undergraduates, who took part for course credit. They were randomly assigned to one of the three experimental conditions (mortality salience vs. television vs. dental pain).

Procedure and material

Upon entering the laboratory, participants were asked to fill out a booklet containing three ostensibly unrelated studies. As in Study 4.1, mortality salience was manipulated in the so-called first study. Participants had to answer an open-ended question concerning death; the same manipulation and controls as in Study 4.1 were used. The participants were then asked to continue with the second study, which was, again as in Study 4.1, a filler task.

Dependent measures. The third study was presented as an impression-formation task regarding geometric figures. Each participant was presented with four figures, each consisting of a set of squares which differed in number (10 vs. 3) and cohesiveness (close vs. distant, see Figure 4.2). The participants had to indicate on a 9-point scale, ranging from 1 (not at all) to 9 (very much), to what extent they thought the figure made them feel safe. Once the participants had finished the final part of the experiment, they were thanked for their participation and carefully debriefed. None of the participants reported that they were aware of the purpose of the study, or thought the “unrelated” studies were actually related.

Results and Discussion

In order to test for our hypothesis, we used an analytic approach similar to the one used in Study 1. We contrast coded the effect of Mortality salience, with a weight of ‘2’ applied to the mortality salience condition and a weight of ‘-1’
applied to the two control (i.e., dental pain and control) conditions. We also contrast coded the effect of Figure type, with a weight of ‘3’ applied to the large and cohesive figure condition and a weight of ‘-1’ applied to the three other figure conditions. The Mortality salience contrast did not yield significance $F(1, 42) = 1.29, p = .26$, but the Figure contrast did $F(1, 42) = 55.98, p < .001, \eta^2 = .57$. In line with predictions, we obtained an interaction between these two contrasts, with large and cohesive figures increasing more feelings of safety (relative to the other figures) in the mortality salience than in the two control conditions, $F(1, 42) = 4.69, p < .05, \eta^2 = .10$.

Figure 4.2 - Figure consisting of squares.

\begin{center}
\includegraphics[width=\textwidth]{figure4.2.png}
\end{center}
Complementary analyses confirmed there was an effect of mortality salience, $F(2, 42) = 4.01$, $p = .025$, $\eta^2 = .16$ on how safe people felt in the group with more squares close together (see Figure 2B). Simple contrast analyses showed that participants in the mortality salience condition indicated that the figure made them feel safer ($M_{\text{mortality salience}} = 6.13$, $SD = 1.13$) compared to participants in the two control conditions ($M_{\text{tv}} = 5.07$, $SD = 1.03$, $F(1, 42) = 6.75$, $p < .01$, $\eta^2 = .14$ and $M_{\text{dental pain}} = 5.20$, $SD = 1.21$, $F(1, 42) = 5.20$, $p = .01$, $\eta^2 = .11$). No significant differences in perceived safety were found for the other three figures, $Fs < 1$.

In addition, simple contrast analyses showed that participants in the mortality salience condition indicated that Figure 2B made them feel safer ($M_{2B} = 6.13$, $SD = 1.13$) compared to Figure 2A ($M_{1A} = 3.40$, $SD = 1.35$, $F(1, 42) = 28.49$, $p < .001$, $\eta^2 = .40$), Figure 2C ($M_{2C} = 4.67$, $SD = 1.35$, $F(1, 42) = 8.15$, $p < .01$, $\eta^2 = .16$) and Figure 2D ($M_{2D} = 4.13$, $SD = 2.33$, $F(1, 42) = 15.29$, $p < .001$, $\eta^2 = .27$).

In line with our expectations and the results of Study 1, these findings show that figures that consist of more items close together increase perceived safety when mortality is salient. This suggests that mortality salience is likely to activate a need to belong to large and cohesive groups.

**General Discussion**

The extant TMT literature shows that, when reminded of their mortality, people tend to cling more to groups, in particular groups they identify strongly with. In the studies presented here, we aimed to add to this by suggesting that – when people are confronted with their own mortality - they view figures that bear a resemblance to large and cohesive groups as safer, even when these figures are “meaningless” or abstract. The findings from the present studies support this hypothesis. In Study 4.1, we found that when mortality is salient, people indicate that standing in a (fictitious) large and cohesive group of human avatars makes
them feel safer. In Study 4.2, we applied our hypothesis to more abstract groups by asking participants their safety ratings for large or small, clustered or non-clustered groups of (non-human) squares. Again, we found that when mortality is salient, figures of more squares close together are perceived as being safer. The findings of both studies confirm that, following mortality salience, abstract geometric representations of large and cohesive groups make people feel safer.

The results of the present studies extend the findings of previous work on the terror-managing function of group affiliation. We have shown that both the size and the cohesiveness of groups aid in coping with existential fear. The key contribution of our research – what sets it apart from previous TMT findings – is that these findings are the first to show that abstract and meaningless figures can have a terror-managing function. It is important to note that it is not the size nor the cohesiveness alone, but a combination of the two features that holds the strongest terror-managing function. In the light of TMT, our results show that coping with existential fear goes beyond culture and established (in)groups. This may indicate that certain features that humanity has found to be valuable in real-life groups, such as size and cohesiveness, exert influence even when they are presented in an abstract form.

Although we believe that the results presented are quite clear, several points may need further attention in future research. One question of interest is how broad these finding are, and if they can be generalized beyond figures. For example, will this also work for company logos, or other icons that we encounter daily? In addition, in future research, features that have a terror-managing function in an abstract form could be further explored. One could, for example, argue that certain colors are more closely associated with life and health, whereas others hint at death or illness. Another point worth raising is that previous research has shown that people evaluate abstract art more negatively when mortality is salient, because it is hard to comprehend and make sense of (Landau, Greenberg, Solomon, Pyszczynski, & Martens, 2006). Indeed, comprehension is
one of the basic needs that people have when they are confronted with mortality (Renkema, Stapel, Van Yperen & Maringer, 2008), and abstract art often conflicts with this need. Thus, these results seem to contradict our findings. In the current studies, however, we use abstract figures differently, and argue that people attribute meaning to abstract figures in order to buffer existential threat. Nevertheless, these opposite reactions to abstract stimuli are certainly an area of interest for future research.

By focusing on abstract representations, we aimed to gain a better understanding of the basic psychological function of groups when mortality looms. As expected, we found that size and cohesiveness are two features of groups that aid in buffering existential threat, aside from the mainstream cultural worldview hypotheses. A valid question one might ask in response to our findings is where cultural worldview defense, one of the most researched defensive mechanisms in TMT, fits in. One possible answer to this question is that both group size and cohesiveness may serve a terror-managing function above and beyond affirming the cultural worldview. This would mean that they could provide an addition to the wide range of worldview defense effects of groups TMT findings have shown thus far.