Running Head: TERROR MANAGEMENT THEORY

Stereotypes and Mortality Salience: A Terror Management View on Prejudice and

Stereotype

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Abstract:

 Prejudice and stereotype are reviewed from various theoretical perspectives within social

psychology. Terror management theory (TMT) and the theoretical works of Ernest Becker

(1971,1973) as well as the empirical research of Greenberg et al. (e.g., 1991) and others

(e.g., Solomon et al. 1991) are reviewed. Prejudice and stereotypes are reviewed from a

TMT view. Theories, adaptations and history of the Stroop effect and its use in social

psychology and more specifically stereotypes are investigated.

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Stereotypes and Prejudice

Prejudice is an attitude (usually negative) towards members of a specific group,

based solely on their membership in that group. Prejudice can but does not always

involve negative behaviours (or discrimination), which are directed towards members of a

group that the individuals is prejudice towards. Prejudice is a cognitive structure that

effects the way individuals organize, process and recall information about groups.

Stereotypes, although sometimes positive are usually negative over-generalized beliefs

about members of specific social groups and have been considered a strong contributor to

prejudice, discrimination and inter-group conflict (Allport, 1954; Kawakami et al., 1998;

Dovidio et al., 1996). Due to the negative consequences that prejudicial discrimination

has on social behaviour, stereotypes and prejudice have been intensely studied from a

number of theoretical perspectives (Allport, 1954; Sherif et al., 1961; Tajfel & Tuner,

1979; Jussim, Coleman, & Lerch, 1987).

Realistic-conflict theory (e.g., Sherif et al., 1961), social learning theory (Bandura,

1971) and social categorization (Tajfel & Tuner, 1979) provide possible explanations for

the cause and origin of prejudice. According to the realistic-conflict theory, prejudice

develops from direct competition between groups over valued resources. Research by

Sherif et al. (1961) provides an excellent example of how this theory operates. Using

eleven-year old boys and a summer camp, Sherif et al. divided the boys into two groups who initially enjoyed camp related activities. After the first week the boys were told that their groups would compete for much desired prices (e.g., pocketknives). Soon after the competitions began, the groups began to display signs of hostility and used labels such as 'cowards' to describe out-group members. Within two weeks of competition, the groups showed signs of prejudice, discrimination and inter-group conflict. Sherif et al. further demonstrated that after establishing prejudice their attitudes could be reversed by having the boys work towards a common goal.

Social learning theory (Bandura, 1977) states that prejudice is developed through social learning and through the process of classical conditions. This theory is straightforward and examines how prejudices develop rather than why prejudice develops and will receive no more attention in this review. Social categorization (Tajfel & Turner, 1979) looks at group dynamics between in-groups and out-groups to explain prejudice and stereotyping. From this perspective individual view others as either belonging to their own group (in-group) or to another group (out-group). This 'us' and 'them' classification of individuals effects social cognition and attribution. An example of social categorization effects on social judgment is the ultimate attribution error, which is the tendency to see in-group members in a more positive light and to see out-group members in a more negative light.

Prejudice may persist in part because it may increase self-worth (Fein & Spencer, 1997). Prejudice and negative evaluation of others can stem from the motivation to maintain a feeling of self-worth and self-integrity. Threats to self-image may lead individuals to evaluate individuals prejudicially. Stereotypes may play an important role

in maintaining self-image. Because stereotypes are mainly negative over-generalized beliefs that develop out the belief the all members of a group have similar characteristics (e.g., out-group homogeneity); they may easily function as a way to bolster self-image. Fein & Spencer (1997) found that participants evaluated an individual more negatively if they thought that person was a member of a stereotyped group, than if they thought that the person was not from a stereotyped group. If the individuals had their self-image bolstered through an affirmation process this effect did not occur. Fein & Spencer also found that if participant's self-image was threatened they tended to evaluate individuals more stereotypically. Participants who had their self-image threatened increased their negative evaluations of individuals that were believed to be of a stereotyped group and this negative evaluation increased the individual's self esteem. This research suggests that prejudice and stereotype use help to maintain self-image and bolster self-esteem.

Another reason prejudice may persist is through the use of stereotypes. Stereotypes are a form of heuristic or cognitive tool that helps to save time and cognitive effort. Once stereotypes are formed the individual who holds the stereotypes may over look stereotype conflicting information. Kunda & Oleson (1995) suggest that when individuals meet a stereotype inconsistent individual they may try to subtype them as deviants. One study exposed participants to non-promiscuous gay men, which challenged their stereotype of gay men as promiscuous. When subjects had no more information about the target group they tended to view gay men as less promiscuous in general. If participants were told that the non-promiscuous men all shared a profession they had not previously believed to be associated with gay men they subtyped the gay men as deviant and did not change their stereotyped beliefs about gay men being promiscuous. Kunda

and Oleson (1995) concluded that neutral attributes not associated with a stereotyped group caused individuals to perceive the attribute as atypical of the stereotype, which lead to sub-typing them as deviant. Generally speaking, this study suggests that individuals will use information about individuals who are counter-stereotypical to explain away the inconsistent behaviour. An interesting effect called 'boomerang effect' was noted by Kunda & Olsen (1997). These researchers have demonstrated that participants who were exposed to individuals who deviated extremely from an expected stereotype may increase their belief in the stereotype.

Yet, stereotypes may be inhibited even in high prejudice individuals if they are motivated to do so. Sinclair and Kunda (1997) found that individuals who are highly prejudice might inhibit stereotype activation. Using two different measures of stereotype activation, these researchers found that when high prejudice participants who were motivated to think highly of a Black individual because a Black evaluator praised them inhibited stereotype activation of Black individuals. Participants who received no praise showed no inhibition of Black stereotypes. Cognitive load has also been shown to inhibit stereotype activation, but once a stereotype has been activated high cognitive load increases the likelihood that it will be applied (Gilbert and Hixon, 1991).

Prejudice and stereotypes persist in part because we have the ability to explain away or ignore contradictory information. Stereotypes also persist because when confronted with contradictory information we can either ignore them or explain them away. Allport (1954) stated that when confronted with individuals who challenge our stereotypes we 'fence them off'. Stereotypes are hard to change because we isolate the deviant examples as atypical and unrepresentative of the group, essentially we explain

away the inconsistency. Stereotypes may also persist in part because they provide use

with quick and possibly useful information. In other words, stereotypes exist because

cognitively we are lazy.

<center>Theories of Stereotypes</center>

Three theories within social psychology address how stereotypes influence

perceptions about members of both in-groups and out-groups: complexity-extremity

theory (e.g., Linville, 1982), assumed characteristics theory (e.g., Feldman, 1972) and

expectancy-violation theory (modeled after Kelley's (1971) attributional processes of

augmentation and discounting). Each of these theories proposes different processes

behind the choice of information used in social judgment and attribution about out-group

members. These three theories see stereotypes as providing potentially useful information

and view stereotypes as a form of heuristic. Jussim, Coleman, & Lerch (1987) propose an

integration of these three but first they will be reviewed individually and then from an

integrated model.

Complexity-extremity theory proposes that individuals evaluate in-group

members differently from out-group members because in-group members tend to have

more social interaction with members of their own group (i.e., in-group). This theory also

posits that evaluations made from many dimensions are less extreme because they would

be evaluated favourably on some dimensions and unfavourably on others. Therefore,

evaluations that take into account many dimensions should be less extreme. On the other

hand if fewer dimensions are used in social judgment the chances of viewing a target (i.e.,

individuals, groups, stimulus) in a more extreme way (positive or negative) increase. This

theory suggests that individuals will polarize their views about targets when fewer dimensions are used. Linville (1982) found that college students used more dimensions when evaluating young people (e.g., other college students) than older people and evaluated older people more extremely. This theory explains why people view some groups more favourably than others and is a possible explanation for stereotypes being applied to groups. If fewer dimensions are used to evaluate certain groups, beliefs about the group's characteristics become over-generalized leading to stereotyping of that group.

Assumed Characteristic theory views stereotypes as providing us with important information about groups (i.e., social economic status, beliefs and values, personality traits). Yet, individuals assume that their own in-group has more favourable characteristics than out-group members. According to this theory in-group bias should be eliminated if direct information about the target's background characteristics is used. The importance of background information in reducing bias has an impact on evaluation of out-group members; assumed characteristic theory does not exclude other influences. Assumed characteristics theory can be seen as a moderator of social bias towards out-group members.

Expectancy-violation theory also views stereotypes as providing information about group members. This theory posits that when individuals violate stereotype expectation, evaluations become more extreme. For example, when the violation of a stereotype trait is seen as favourable, attribution tends to be more positive, and if the violation of stereotype is viewed as more negative than expected, evaluation tends to be more extremely negative. Kelley's (1971) discounting and augmenting principles plays an important role in this process. The augmenting principle is the tendency to attach greater

importance to a potential cause of behaviour when inhibitory factors for that behaviour are also present. If racial discrimination is seen as providing obstacles, which make it more difficult for Black men to become successful, a successful Black man may be seen as possessing more positive characteristics than that of a similarly successful White man. The discounting principle is the tendency to attach less importance to a potential cause of behaviour when other factors for the cause of the behaviour are present. Blacks who are perceived as having low social economic status may be seen as having fewer negative characteristics than a low social economic status White individual.

Jussim, Coleman, & Lerch (1987) tested the main predictions of complexity-extremity theory, assumed characteristics theory and expectancy-violation theory using four pairs of White and Black applicants with similar characteristics. All three theories made predictions but could not singularly provide for all observations. When all three theories were used in an additive way it produced the best explanation for all observations. Jussim, Coleman, & Lerch provide for empirical evidence that multiple processes influence evaluations. According to these authors, the easiest way to integrate the three theories is to view them as having equal effect. By integrating these three theories Jussim, Coleman, & Lerch provide a clear example of the complex nature of how stereotypes influence the evaluation of in-group and out-group members.

Another perspective on prejudice and stereotype is terror management theory (e.g., Greenberg, Pyszczynski, & Solomon, 1986), which proposes that prejudice and stereotypes are used to help protect against the fear of human mortality. According to terror management theory (TMT) individuals derive a personalized concept of reality based on the prevailing cultural worldview. This worldview provides for the universe

with order, meaning and purpose, which help to protects against existential fears. When these existential fears are made salient it is theorized that individuals will be committed to maintaining their cultural worldview and disparage those who oppose their worldview. From this line of reasoning, out-group members are threatening because they hold different worldviews, thereby threatening the validity of the in-groups cultural worldview. TMT hypothesizes that reminders of mortality will increase the need to perceive out-group members in stereotypical ways, leading to the preference for consistent depictions of out-group members.

Terror Management Theory (TMT)

Ernest Becker (e.g., 1973) attempted to synthesize the ideas of a wide variety of theorists in pursuit of understanding the dynamics of human social behaviour. Through the works of Alfred Alder, Charles Darwin, Sigmund Freud, Karen Horney, Soren Kierkegaarde, Friedrick Nietzche, Otto Rank and many others, Becker developed theories linking human culture and the need for self-esteem. Becker (1962) proposed that the need for self-esteem is uniquely human and it exists because of our cognitive abilities (e.g., our use of language, symbols and self reflection). Although these cognitive abilities are beneficial, they also lead to some uniquely human problems. For example, we have the capacity to wonder why we exist and to understand that the universe is an uncontrollable, indifferent and hostile setting in which the only inevitable outcome or certainty is our own self-annihilation: death. Furthermore, most humans are consciously aware of the fact

that at any moment, we may fall victim to an early death from any number of chance occurrences. Becker states that we would be terrorized with fear if we could not deny this concept. According to Becker, culture helps to deny the concept of self-annihilation through giving the universe order, predictability, meaning and permanence. Becker notes that all cultures have a theory regarding the creation of the universe (e.g. God, mythology, astrophysics, evolution), a standard for leading a decent and meaningful life and hope for death transcendence or immortality (Becker, 1973). From this analysis Becker (1973) hypothesizes that culture provides the individual with a worldview that allows for the denial of human vulnerability and mortality. Becker argues that humans are unique not because we are social, but because we are cultural. Culture provides individuals with a basis for valuing themselves; and individual self-esteem is derived from viewing oneself as valuable within the context of the cultural worldview.

Becker's hypothesis that self-esteem's basic nature is to provide protection from anxiety caused by the fear of death falls within the realm of experimental science. Approximately 75 studies on terror management theory (Goldenberg et al., 2001) have yielded results consistent with Becker's main hypothesis: self-esteem and culture helps to buffer anxiety caused by the awareness of death. Terror management theory (Greenberg, Psyszynski & Solomon, 1986; Solomon, Greenberg & Psyszynski 1991) is an adaptation of Becker's theories, assumes that humans are similar to other animals because they share evolutionary similarities including a strong biological need to preserve one's existence. Animals have only an immediate recognition of death but humans are forewarned of death's certainty, which conflicts directly with the instinct for continued existence resulting in fear and anxiety. This fear is managed by a two-part anxiety buffer which

consists of (1) a personalized version of the cultural worldview and (2) self-esteem. The cultural worldview is defined as a subjective understanding of the pervading cultural paradigm, and leads the individual to view it as permanent, structured and meaningful. The cultural worldview also allows for the individual to attain a sense of personal value and worth (Greenberg, et al., 1996). In return for following the norms set out by the cultural worldview, the individual is promised either literal or symbolic immortality.

The second part of the anxiety buffer is self-esteem, which functions on the belief that one is living up to the cultural worldview. The validity of the cultural worldview is of great importance to the individual, because self-esteem is increased by recognizing that he or she is living up to the cultural beliefs of society. If the validity of the cultural worldview is challenged, the individual must defend it, because of the relationship between self-esteem and culture. Individuals who share our worldview help to bolster our faith in it by mutual validation, thus increasing its effectiveness as an anxiety buffer. Those who threaten the individual's worldview threaten the individual's faith in it and diminish its effectiveness as an anxiety-buffer.

Becker (1962) argues that self-esteem is the feeling that one is an object of primary value in a meaningful universe. He claims that self-esteem begins to take on the role of an anxiety buffer long before the individual is able to conceptualize death. From birth onward the child responds with negative affect to anything that threatens its existence e.g., hunger, strangers and large dogs, etc. Becker describes these infantile concerns as innate or instinctive anxious reactions to the threat of annihilation. As children, humans are utterly dependent upon their caregivers so dependency motivates children to stay in their parents' good graces. As a child grows, the parents' response to

the child's behavior depends upon the situation. Parents will offer love, comfort and need fulfillment when the child's behavior meets their approval, but when the child does not live up to these standards, the parents may threaten to withdraw these securities. As a result of these interactions children learn about the relationship between behavior and outcome. They learn to meet parental approval, which will in turn foster a sense of worth in them by knowing they are of primary value to their parents. Meeting the expectations of a parent is associated with parental security and safety. The parent's standards and values are a reflection of the pervading cultural view and therefore the child will ultimately learn to associate cultural approval with safety and security (Greenberg et al. 1993). Becker (1973) postulates that worldview values are probably developed and internalized through classical conditioning during early childhood and are further reinforced through cultural teachings of a just world (e.g., those that violate cultural norms will have to face justice).

When the individual lives up to the standards of the culture, the culture promises need satisfaction and protection from negative outcomes, and the possibility of actual immortality through concepts, such as spirits and souls. Culture may also offer symbolic immortality through contributing to the seemingly permanent culture. For example, art, science, political achievement and children etc., may offer symbolic death transcendence (Becker, 1973). The construct of death transcendence becomes important because the child will eventually realize that their parents cannot protect them from the finality of death. As the cognitive capacities of children increases, they begin to realize that their parents cannot protect them from everything. The child's primary source of anxiety

reduction is undermined so a new means to deal with anxiety must be developed. The cultural worldview becomes this new method of anxiety reduction.

Socialization and education of children serves to instill the values and worldview of the predominate culture. History, religion and science all convey a cultural conception of reality, which can provide order and meaning. Cultural symbols (such as money, flags, governments, churches) and cultural rituals (such as prayers, national anthems, following new and sports events) play a major role in maintaining our faith in reality, and they confirm both the importance and permanence of the culture. TMT states that any experience, which threatens our cultural worldview by implying it, is invalid or suggests another valid version of reality threatens self-esteem and increases anxiety. TMT suggests that negative attitudes towards out-groups exist because they threaten the validity of the in-group. A large part of in-group and out-group hostility can be seen as a result of differing values and beliefs. TMT suggests that out-groups committed to their worldview are threatening because they question the validity of the in-group's worldview. "The individual cannot maintain a sense of absolute personal value if the basis of such judgment is merely one of a wide variety of subjective worldview " (Greenberg et al., 1986, p.176). History is based on repeated accounts of different cultures coming into contact with each other and attempting to eradicate one another. Becker (1972) states that when cultures or groups within cultures feel threatened by the fact that their cultural worldview may in be incorrect, conflicts can arise.

Even individuals within the same culture may threaten each other's self-esteem. For example, to a professional hockey player the ability to skate quickly and score goals may be essential to his self-esteem and self worth. He may not value the ability to run

parametric tests or interpret statistics. Statisticians, on the other hand would value

statistical knowledge and therefore find it essential to their self-esteem. The statistician

may also believe that hockey is an utterly useless and barbaric sport. These individuals

may share certain cultural values (both may be catholic, love dogs, conservatives) but

their individual differences regarding which skills are valuable may threaten each other's

basis for self-esteem (Greenberg et al., 1986). In general, TMT hypothesizes that those

with dissimilar views may threaten our basis for self-esteem and be subject to negative

reactions.

TMT proposes that culture reduces the terror produced by the awareness of our

vulnerability to mortality by providing shared symbolic conceptions of reality which gives

order, predictability, meaning and permanence to our lives (Greenberg et al., 1986).

Culture provides personal value and self-esteem, which serves as an anxiety-buffering

function while self-esteem provides a basic sense of security.

Empirical Research In Support of Terror Management Theory:

Self-esteem and TMT

The empirical research involving TMT focuses on two primary hypotheses (1)

mortality salience hypothesis: reminders of death increase the need for association with

culture worldview and worldview defense and (2) self-esteem and culture both provide a

defense against anxiety caused by the awareness of death. The following is a review of

the most noted studies in the field of terror management theory research.

Essential to TMT's position is the notion that self-esteem is necessary because it

provides protection from deeply rooted fears regarding mortality and vulnerability.

Greenberg et al., (1992) conducted three studies to assess this proposition by experimentally increasing self-esteem, exposing subjects to threats, then assessing the anxiety produced in response to the threat. In the first study, participants were given either a neutral or positive personality feedback and then were exposed to either a neutral video or a video depicting graphic death related scenes. Participants who had previously filled out a battery of personality inventories participated in the feedback lab conditions. Favorable feedback indicated that the individuals were well adjusted and likely to accomplish all their goals. The neutral feedback stated, "While you have some personality weakness, you are generally able to compensate for them". Individuals who had their self-esteem increased using the positive personality feedback reported significantly less anxiety in response to the death video than individuals in the neutral personality feedback condition. The high self-esteem MS subjects reported similar levels of anxiety as subjects who viewed the neutral video. This finding is consistent with the belief, that anxiety surrounding one's death can be reduced by elevating an individual's self-esteem. In a second study using manipulated self-esteem and threat of painful electric shock (in actuality, no subjects were shocked) subjects who received positive feedback regarding their IQ scores had lower skin conductance levels in response to threat of electric shock than subjects who were not given feedback on the IQ test. To investigate whether positive affect rather than manipulated self-esteem was responsible for reduced susceptibility to anxiety in the above mentioned studies, Greenberg et al. (1992) included a measure of positive affect in a replication of the second study. This study revealed that self-esteem reduced anxiety, but the bogus feedback did not reveal a significant affect as measured on the PANAS-X between the treatment and control participants. Perhaps more importantly,

affect did not mediate the results of the experiment. Greenberg et al. have shown that self-esteem does function as a buffer to anxiety caused by graphic depictions of death, and to threat of pain.

Kunda, (1987) found that people distort their behaviour and perceptions to deny their vulnerability to an early death. In response to that study, Greenberg et al. (1993) conducted an experiment in which half the participants were told that high emotionality led to an early death, while the remainder were informed that low emotionality lead to earlier death than the average person. Greenberg and company hypothesized that subjects in the high self-esteem manipulation (as used in Greenberg et al., 1992) would reduce the feeling of vulnerability and thus reduce denial of an early death. Subjects who were told that emotional people die young reported lower emotionality than subjects who were told that emotional people lived long lives. High-esteem was predicated to reduce the need for defensive distortions. Results revealed that subjects who contemplated their own mortality, and had a boost to self-esteem did reduce the need to deny vulnerability of an early death. A second study was done with procedures identical to the first study; except of high trait self-esteem was instead of manipulated self-esteem provided identical results. Results of this study were similar to the first study supporting the original hypothesis.

An interesting study by Goldenberg et al., (2000) explored the concept of self-esteem and its relationship to body image under the TMT paradigm. Certain expectations regarding what is considered attractive is reflected in the value North American place on physical appearance. Meeting the cultural standards about the human body seems to be a preoccupation among many people. Goldenberg et al. proposes that the body is a source

of self-esteem particularly to those who meet cultural standard of beauty. If thoughts of

death increase the need to meet cultural standards, then reminders of mortality should

increase the focus on ideals related to the body for individuals who believe their bodies

meet expected standards. Conversely, it should decrease focus on the body for those

individuals who believe their bodies do not meet standard expectations. If MS increases

striving for higher self-esteem, then people who feel they meet these internalized

standards should respond by making their body a more focal aspect of themselves

(Goldenberg et al., 2000). Using the MS condition developed by Rosenblatt (1989), two

open ended questions asking about the feeling and emotions aroused by thinking about

death and a the Body Esteem Scale (BSE) designed by Franzoi and Shields (1984),

Golderberg et al., (2000) found that subjects with high self-esteem regarding their bodies

increased their identification towards their bodies and those with low body esteem did

not. For individuals who are unable to derive a sense of self-esteem from their bodies,

increased awareness or identification to it would serve no useful purpose because it

would fail to increase self-esteem and could possibly reduce self-esteem. In a second

study Goldenberg et al., (2000) found MS increased the appeal of sex (an activity of the

body). High body image is related to more positive attitudes towards sex and low body

image is related to less positive attitudes about sex. A 2 (MS/control) X 2 (high body

esteem/low body esteem) factorial design investigated this hypothesis and found

significant results. A 20-item scale, half of which reflected the physical aspects of sex and

the other half addressed physical closeness with a partner was used as the dependent

measure. After MS manipulation high body esteem subjects reported physical aspects of

sex more appealing but those with low body image did not. In a third study, those who

valued physical appearance, (high appearance focus) as scored by the Objectified Body

Consciousness Scale by McKinley and Hyde, (1996) but felt they had failed to meet the

standards of physical beauty (low body esteem) decreased their tendency towards

monitoring their appearance after MS. Generally, these studies support the TMT

hypothesis that MS increases striving for self-esteem. Also they specifically show that

meeting cultural standards is a way to increase self-esteem when threatened by reminders

of mortality.

Goldenberg et al. (2001) further explored the effect of MS and the human body.

This study was a departure from other TMT studies, which have mostly involved the self-

esteem and worldview defense hypothesis, and will be included here because it is related

to the previous article. Goldenberg looked for intensified reactions of disgust in response

to objects, behaviours and events as well as the need to distinguish humans from animals.

TMT proposes that humans are motivated to distance themselves from other animals

because of the association between animal nature and mortality. Subjects were exposed to

the MS manipulation and then completed a disgust measure which included animals,

body waste product, food, sex, and hygiene (e.g., "You see a maggots on a piece of meat

in an outdoor garbage pail", "It would not bother me to be in a science class, and see a

human hand preserved in a jar") The mortality salience group had significantly higher

scores on the disgust sensitivity scale. These results suggest that the "disgust reaction is a

distal and symbolic means of coping with the problem of death by enabling us to evaluate

ourselves above the rest of the animal kingdom" (p.423). In a separate experiment,

Goldenberg et al. (2001) gave subjects either an essay drawing similarities between

human and animals or an essay proposing the uniqueness of humans in comparison to

other animals. Subjects rated the essays by responding to six questions about their reactions to the essays. In the control group no difference was found between the evaluations of the two essays, but there was a significant interaction between MS and essay type. The essay depicting humans as dissimilar to other animals was preferred more than the essay depicting humans and animals as similar. This study provides support for the hypothesis that humans tend to distinguish themselves from other animals. It is interesting that humans after reminders of mortality will identify with their bodies, only if it is a source of self-esteem yet at the same time when reminded of death, humans tend to be disgusted by creatureliness and other aspects of being an animal, e.g., defecation. These two studies provide insight into the way humans view themselves and the animal kingdom. Certain cultures have gone to great lengths to change the human body in some way, it could be hypothesized that these artificial distortions to the human body like binding of feet, tattooing and bodybuilding are all attempts to distinguish the human body from other animals. It may also be done to change the appearance of the body so as to hides its true nature: a body that is susceptible to sickness and disease, which will eventually die and decay.

Some people engage in risk taking behaviour such as unsafe sex, drinking and driving abusing drugs. Research by MacDonald (1999) on alcohol and condom use proposes that alcohol myopia provides for a large part of risk taking behaviour for intoxicated in regards to alcohol. The motivation for those who are not intoxicated to engage in risky behaviours is unclear. One possible explanation is that individuals may decide to engage in risk taking behaviour to avoid or minimize potential loss and to maximize potential gains (Lopes, 1993). TMT proposes another possible explanation.

One might intuitively assume that MS would increase the awareness of the possibilities of a negative outcome regarding reckless driving but MS increases denial to early death and vulnerability as reported by Greenberg et al., (1993) and therefore may increase risk-taking behaviour. TMT suggests that when reminded about mortality, people strive for self-esteem by engaging in activities that enhance self-esteem, for example sex for those who have high body images. The effects of MS on self-esteem was explored in an a study by Ben-Ari, O., Florian, V., & Mikulincer, M. (1999). These researchers used male soldiers in the Israeli Defense Forces to explain the motivation behind risk taking behaviour from a TMT perspective. Ben-Ari et al. (1999) proposed that for young people, self-worth might be derived from the ability to drive, by increasing competency or giving one a sense of mastery or even social prestige. Therefore, driving may be a way of enhancing self-esteem. In this study, Ben-Ari et al. divided the male participants aged 18 to 22 into two groups: MS and control. Subjects completed a self-esteem inventory and a constructed scale that assessed whether or not the individual derived self-esteem from the ability to drive. A self-report measure on proneness for reckless driving was the dependent measure. Overall, the results of this study revealed that participants reacted to the MS induction with higher reported proneness to drive recklessly only when they perceived driving as relevant to the self-esteem. Those participants who indicated no connection between driving and self-esteem responded to the MS condition with fewer reported incidents of reckless driving. This is interesting in itself because it reflects a willingness to follow social norms and can be seen as cultural worldview defense in response to MS. In attempts to make the above experiment more ecologically valid, the researchers employed a car simulator and speed was the dependent measure for

recklessness. A 2 (MS/Control) X 2 (High/Low esteem) factorial design was used. High

and low esteem were assessed in regards to driving. The driving simulator used a

computer screen with a panoramic view and participants sat in a car seat and used normal

car apparatus (e.g., gas and break petals, steering wheel, speedometer) to operate the

simulator. The results of this experiment indicated that MS induced subjects who viewed

driving as a means to increase self-esteem, drove significantly faster than did the control

subjects. In a 4th study, the researcher looked at the role of feedback on driving as a

moderating factor to MS on reckless driving. The study used a 2 X 2 X 2 factorial design:

mortality (yes or no), driving as relevant to self-esteem (yes or no) and positive feedback

(yes or no). This study used the same methods as the simulator study but added the

positive feed back factor. The purpose of this study was to examine the idea that positive

feedback reduces the effects of MS on the driving speed. A possible explanation for this

finding is as follows: those who feel driving is relevant to their self-esteem, and are

threatened (e.g., MS) react to threats of self-esteem by engaging in reckless driving as a

means of enhancing self-esteem, but when positive feedback is given regarding their

driving abilities the individual receives a boost to self-esteem and no longer needs to

strive to enhance self-esteem. Positive feedback seemed to nullify the effects in both low

and high esteem MS groups. Overall, these studies lend further support to the hypotheses

that self-esteem is used as a buffer against thoughts about mortality and more specifically

MS led to reckless driving among individuals who perceived driving to be relevant to

their self-esteem. Taken together, these studies lend support to the hypothesis that

self-esteem buffers anxiety caused by contemplating ones mortality. MS causes increased

focus on skills and behaviours that increase self-esteem such as reckless driving, the body

and sex. Reminders of death increased distancing between humans and animals because of the association between animals and creatureliness, which is an indirect reminder of mortality. Self-esteem has also been shown to reduce anxiety caused by threat and depictions of graphic death scenes as well as physical arousal to threat of pain. Research into the anxiety-buffering hypothesis has been consistently supportive to TMT.

Worldview Defense and TMT

Other research into TMT has involved worldview defense. According to TMT, self-esteem and culture both provide protection from the fear of death. If the cultural worldview provides methods to reducing anxiety then when confronted with concerns of mortality, the individual should increase the need for protection provided by the faith the worldview. TMT proposes that this increased need for faith in the worldview will be expressed in positive affect for those who support the worldview and negative affect for those who oppose the worldview. Behaviours and attitudes that are in conflict with the worldview will also be negatively evaluated by those who are threatened by MS. Therefore according to terror management theory, MS should amplify preferences for worldview-supporting others over worldview-challenging others. This 'bias' has been termed 'worldview defense' in the literature (Harmon-Jones et al., 1997).

Greenberg et al. (1990) conducted three experiments to test the hypothesis that reminders of mortality increases attraction to those who validate our beliefs and decreases attraction to those who threaten our beliefs. The first experiment involved examining MS effects on similar and dissimilar religious backgrounds.

Forty-six Christian participants filled out personality questionnaires, a "Who am I?" questionnaire regarding religious affiliation with half the participants getting a mortality manipulation (e.g., Rosenblatt, 1989) while the other half did not. Subjects were then given two sets of measures similar to the materials they filled out earlier. One set of assessments appeared to be completed by a Jewish respondent and the other by a Christian respondent. Subjects rated 20 characteristics on a continuum from not applicable to extremely applicable. Of these characteristics 5 were common in anti-Semitic writings: stingy, manipulative, snobbish and the other traits contained words like honest, ambitious, impulsive, warm etc. Subjects were assured anonymity by allowing them to seal their results and put them with many other such anonymous assessments. Results showed that MS effected ratings on an attraction scale. The participants (all Christian) showed that they increased their attraction to Christianity and had decreased attraction to Jews. This effect was only found in the MS group. Analysis of the trait ratings revealed a significantly higher evaluation for the Christian. The means for the ratings of the Jewish target were not significantly different from the control's rating of the Jewish target. Greenberg demonstrates that MS increases positive evaluations of in-groups and negative (e.g. The Interpersonal Judgment Scale) evaluation of out-groups. Although no derogation or negative evaluation was noted in the trait assessment compared to the control, removing the availability to positively evaluate the in-group may possibly lead to more negative assessments of the out-group.

In the second experiment Greenberg et al. used the construct of authoritarian personality (Adorno et al. 1950), which is characterized by authority, rigidity conventionality and disdain for the worse off. According to Greenberg et al. those high in

the authoritarian trait would respond to mortality salience by derogation of dissimilar others. Subjects were assigned to either a MS or non-MS conditions and were further divided into high or low authoritarian based of score on the F-scale (Adorno et al., 1950). Subjects were asked to rate a fellow participant's score. The subject received a the bogus questionnaire that either was in 75% agreement to their own questionnaire or only 25 % agreement to their questionnaire. Results of the analysis of variance revealed that MS increased derogation toward dissimilar others by the high authoritarian subjects. This effect was only noted in the MS group and not in the control condition. In a 3rd study by the same authors, subjects were asked to evaluate an interviewee who gave a positive, neutral or negative view about America. The credentials of the interviewee were also manipulated. Half of the subjects were told that the interviewee was a respectable American, the remaining subjects thought the target was a communist. The results from this experiment supported the hypothesis, MS increased negative evaluation of the interview when the interviewee gave negative evaluations about America. The control groups did not give significantly negative evaluations of the target. These results are consistent with the theory of terror management: reminders of death influences the evaluation of similar and dissimilar others.

Harmon-Jones et al. (1997) tested the hypothesis that self-esteem would decrease the need for worldview defense. In an experiment that manipulated self-esteem by means of either positive or neutral feedback on a bogus personality test, participants received either the MS or control condition and then evaluated a person who either supported their worldview or threatened it. After the self-esteem manipulations (neutral/positive) and treatment conditions (MS/control), participants were asked to evaluate two essays written

about the U.S. and were told they had been written by foreign students. Each subject received the same two hand-written essays; one that was pro-U.S., the other was anti-U.S. in nature. The results of the experiment were consistent with predictions. MS neutral feed back participants rated the anti-U.S. paper more negatively as well as the individual who was said to have written it. Those who had been given the MS condition along with positive feedback rated the papers in the same manner as the control condition with less pro-U.S. bias (Harmon-Jones et al., 1997). In a second study, which replicated the first study using trait self-esteem instead of manipulated self-esteem found similar significant results. This study provides support that MS increases the need to defend the worldview and also supports the self-esteem anxiety-buffering hypothesis.

A very convincing and innovative study by McGregor et al. (1998) showed that MS increased aggression against worldview-threatening individuals. Degradation and aggression towards individuals who are dissimilar to our own worldview, presumably serves to defend the worldview and the individual's self-esteem. McGregor et al. used the amount of hot sauce given to a person as the dependent measure: aggression. In this study participants were recruited on the basis of their political beliefs. Politically conservative and liberal participants were exposed to the MS/control measures. They were then asked to read an essay that was derogatory to either liberals or conservatives. This study was a 2 (MS/control) X 2 (world threatening/world consistent) factorial design. The participants thought that they were involved in two different experiments. Participants were told that they could allocate hot sauce to a fellow participant (actually a confederate) that they were led to believe had written the essay and that this person did not like hot sauce but would have to eat the whole sample given. Results showed that

individuals who read worldview consistent essays did not give a lot of hot sauce (in grams) to the author of the essay, but those individuals who had read the worldview-threatening essay gave the alleged author considerably more hot sauce. MS threatened subjects had elevated levels of aggression, hence, they dispensed significantly larger amounts of hot sauce than the control group or the MS consistent group.

In a second study by McGregor et al., (1998) half the participants, who all received the world-threatening essay, were given the opportunity to give an evaluation of the author of the essay before administering hot sauce. This study replicated the finding of the first study; MS increased aggression against the world-threatening individual however, those individuals who were given the opportunity to express their opinions about the author (e.g., how intelligent they thought the author was, how informed the author was about the politics) gave significantly less hot sauce (similar to the control) to the target. Thus, when given the opportunity to express negative opinions about the individual, participants gave less hot sauce. In contrast, when they were not given such an opportunity they showed their aggression by allocating more hot sauce rather than giving a negative evaluation. These results show that individuals can react in two different ways when threatened, either with marked aggression or with disparaging remarks. When one method is used the other method becomes unnecessary. This study gives behavioural evidence of aggression in response to MS. It also provides evidence that mortality awareness plays a role in social behaviour and lends support to Becker's hypothesis that the fear of death plays a role in inter-group aggression.

Tajfel et al. (1971) demonstrated that putting people into groups causes in-group bias. Harmon-Jones et al. (1996) tested the hypothesis that MS would increase inter-

group bias between minimal groups. . Harmon-Jones et al., assigned participants to either

a MS or control group and either told the participants that they had been randomly

assigned to the group or that they were put into the group for aesthetic preferences (e.g.,

preference for a particular painting). After MS manipulation subjects filled out

personality inventories and were asked to evaluate themselves and both groups (random,

aesthetic). The results showed that the aesthetic/MS group rated the in-group more

positively than the out-group and more similar to themselves. This was not seen in the

random/MS group. This research shows that MS will lead to in-group bias even in

minimal groups. Although, the random/MS group did show a marginal increase in in-

group bias it was not significant, p=0.08.

Schimel et al. (1999) proposed that stereotypes can be seen as part of the cultural

worldview and therefore hypothesizes that MS will increase the tendency to perceive

individual members of out-groups in more stereotypical ways and also increased

preference for stereotype consistent out-group members over inconsistent out-group

members. Schimel et al. conducted 5 studies to test this theory. In the first study,

American college students received either MS or control conditions. After some filler

material, subjects were asked to estimate the percentage of Germans who possess certain

traits. 51 traits were used including some that were stereotypically German. Consistent

with the hypothesis, MS led to greater stereotyped depictions of Germans. In a second

experiment, subjects received the death manipulation and were asked to complete

sentences that either began in a consistent or inconsistent stereotypical way. These

sentences used stereotypical gender behaviours such as "Tom paid for dinner" or "Billy

read the engineering manual", "Sally babysat the neighbors kids", "Mary fed the baby",

etc. This measure was developed and used by von Hippel et al. (1997) and originated

from Hastie (1984). Six stereotypic female and 6 stereotypic male behaviours were used

and 3 male names were exchanged for 3 female names to create the inconsistent

behaviours. If subjects explained away the inconsistent behaviour e.g. Sally paid for

dinner because her husband forgot his wallet, it could be interpreted as trying to make the

stereotype consistent with their expectations. Mortality salience participants showed a

greater tendency to explain away the stereotypic behaviour than the control subjects. Both

males and females in the MS condition explained away equally male and female

behaviour, so it was not gender specific.

In a 3rd study, participants evaluated a stereotype consistent, stereotype

inconsistence and neutral black male confederate. Participants waited with the

confederate who appeared and responded in the stereotype consistent/inconsistent or

neutral manner. In the inconsistent condition, the confederate dressed in conservative

clothing and spoke in a British accent while talking about a productive summer holiday

doing research. In the consistent stereotype condition, the confederate dressed in

stereotypical Black manner (adaptive from videos and movies) and talked in a stereotyped

manner (again adapted from videos and film) in the neutral condition, the confederate

dressed like an average college student and behaved in a causal and neutral manner. After

the MS manipulation, using a cover story about job interview techniques, subjects rated

how much they liked the confederate and how interesting he was. Results clearly showed

that MS subjects liked the consistent Black male confederate and disliked the inconsistent

Black male confederate. In the control condition, the participants liked the inconsistent

stereotype confederate more than the consistent stereotype Black confederate, which

supports previous findings(e.g., Jussim et al.,1996). Analysis of trait attribution revealed similar patterns. MS subjects attributed more positive traits to the consistent stereotype target, and control participants attributed more positive traits to the inconsistent target. These finding are consistent with other research on stereotypes, such that inconsistent stereotypes were liked more than consistent stereotypes (Jussim et al.,1996) but they also show that when reminded of death subjects, showed the opposite pattern. These finding show that stereotypes are part of the cultural worldview and MS increases identification with the worldview.

In a fourth study by Schimel, subjects rated a male or female who either was portrayed in a consistent or inconsistent gender occupation. The target male and female were either said to be a sports writer or a fashion writer. The male and female names were exchanged creating stereotype inconsistencies. As predicted, MS subjects preferred the stereotype consistent targets to the inconsistent targets, which affirm the results of the 3rd experiment. In the 5th and final study, Schimel used high need for structure as a modifying factor. High need for structure, is similar conceptually to high need for closure. Kruglanski et al. (1993) has shown that high need for structure individuals use more prior information to form their opinions. Also, high need for structure individuals do not continue to process information after they have come to a conclusion about it. Thus it was hypothesized by Schimel et al. (1999) that these high need for structure individuals would respond to MS with increased need for consistency and therefore respond to out-group members who were stereotypically consistent, in a more positive manner than inconsistent stereotypes. Subjects evaluated a stereotype consistent or inconsistent gay male on several traits. The consistent gay male was portrayed as feminine, artistic etc.

The inconsistent gay stereotype was described as masculine and had opposite traits from the consistent gay male. The results showed that only subjects high in the need for structure preferred the consistent gay stereotype after MS. The high need for structure control subject preferred the inconsistent gay male. Thus MS increased liking and preference for stereotype confirming depiction of out-group members only when subjects had high need for structure. These 5 studies show that across variables e.g., nationality, sexual orientation, and gender MS increases the use of stereotypes.

TM research has demonstrated that individuals who support our worldview will receive more positive evaluation and increased liking. On the other hand, individuals who oppose our worldview will receive more negative evaluations and decreased liking. Generally, MS increases stereotypic thinking and preference for consistent out-group members. Without this reminder of death, individuals prefer inconsistent out-group members. The stereotypes can be seen as part of the in-group cultural paradigm. Thus when the need to bolster the worldview is high, e.g., after mortality salience, in-group members tend to prefer consistent depictions of out-group members and will react with more prejudice to inconsistent out-group members.

Mortality Salience Effect

Mortality Salience, contemplating death has been the cornerstone of TM research. This effect is modified by self-esteem (e.g., Greenberg et al., 1992; 1993) and MS is responsible for a wide variety of effects including distancing for out-groups, increased nationalism, stereotypic thinking, increased dislike and aggression toward individuals who challenge our would views. Greenberg et al. (1994) investigated the mortality

condition. In one study subjects were given various mortality conditions, Rosenblatt's

(1989) MS condition and a corresponding condition where subjects substituted death of a

loved one for their own death. This study also included a deeper more adverse MS

condition involving different questions that tapped deeper fears and emotions than the

Rosenblatt condition (1989). After the MS (Rosenblatt) condition, subjects were further

asked to write about their scariest thoughts concerning their death or a loved ones death

and "The one thing I fear most about my death or the death of a loved one". Subjects

either wrote about their own death or that of a loved one in the deep MS condition. A

fifth control condition was added for comparison. This condition used the wording in the

Rosenblatt MS manipulation but exchanged the death related worlds to TV related worlds

so that the control subjects wrote about watching TV. Subjects were asked to rate pro-US

or anti- US essays after the treatment conditions. Greenberg et al. (1994) found that the

MS (e.g., Rosenblatt, 1989) condition yielded results consistent with previous research

for both the death of a loved one and death of self conditions. The deeper MS conditions

subjects produced fewer MS effects than the normal MS condition. Greenberg et al. offer

an explanation for this lessening of the MS effect in the deeper condition. The researchers

argue that the deep MS conditions forced the participants to keep in mind such death

related thoughts and therefore they were close to consciousness. This reasoning suggests

the MS effects happen only when the thoughts of death are no longer in current focal

attention (Greenberg et al., 1994). It has been reported within TMT research, that the MS

produces an effect only after a delay of approximately 5 to 7 minutes. Greenberg et al.

addressed this question in an empirical experiment. Three MS conditions were developed

to test the hypothesis of MS delay. A third of the subjects received the MS delay

condition, another third received the MS without delay and one-third received MS continuous condition where visualization was used to maintain the MS induction. The MS condition followed by delay produced results consistent with research and increased pro-US bias. The MS no delay and the continuous MS condition failed to produce the any effect, thus the results indicate that MS effect occurs when thoughts about death are out of current consciousness. In a similar study these researchers found that bringing death related thought back into attention nullifies the MS effect. Subjects completed word puzzles in which either death related words or non-death related words were required for the completion of the puzzle. Thus these studies show that MS effects occur after a delay and only when concerns of mortality are no longer active. A final study using a death theme accessibility measure confirmed that low levels of death related thoughts are accessible after MS and increase after a delay (Greenberg et al., 1994). Arndt et al. (1997) conducted research to address possible explanations of these findings by Greenberg that after MS, death thought accessibility and worldview defense are quite low and then increase after a delay.

Arndt et al. (1997) posits that when reminded of death, suppression of death related thoughts originate outside of conscious awareness. If individuals are trying to suppress concerns of mortality albeit unconsciously, cognitive resources are needed to suppress them. Arndt et al. proposes that if the cognitive load of the individual is high, then the resources necessary to suppress death related thoughts will not be available. The ironic process theory developed by Wegner (1994) proposes that efforts to suppress thoughts involve two processes. The first is a conscious system that actively searches for banished thoughts while the second, (unconscious process) searches for any 'leakage'

from the first operating structure. So this unconscious process looks for breakdowns in the conscious efforts to suppress thoughts. The ironic process theory (Wegner, 1994) states that the very process of active distraction of unwanted thoughts coupled with monitoring unwanted thoughts will increase the unwanted thought. It is this monitoring for the possible reoccurrence that leads to identification and accessibility of the unwanted thought. Wegner (1994) found that when cognitive load was high while trying to suppress target words, the subjects increased the accessibility of the target words.

Using this line of reasoning Arndt et al. (1997) designed an experiment to test the effects of high cognitive load on death thought accessibility. MS subjects had to hold in mind an 11-digit number for various lengths of time until instructed to write it down (cognitive load release). The measure for death thought accessibility was successfully in past research in terror management (e.g., Greenberg et al., 1994). This measure consisted of two separate 20-word fragments; 5 of them could be completed in either a death-related way or a non-death related way e.g. coff*ee* of coff*in*. Subjects released the cognitive load at various intervals throughout the experiment. If subjects actively suppress thoughts of death, cognitive load interfered with the ability to actively suppress such thoughts. When the cognitive load is released early, MS subjects reported the normal pattern of death-thought accessibility (e.g., delayed increase), but when the cognitive load was high (e.g., holding the 11-digit number for longer periods of time) showed the reverse pattern (e.g., initially high and then showing a decrease). This study lends support for an active suppression process in the delayed increase in death-thought accessibility. When subjects had to hold the 11-digit number in their mind for longer time periods, this increased cognitive load, which in turn interfered with active suppression and resulted in

more death-thought accessibility as scored on the death measure (Rosenblatt, 1989).

Subjects who could release the cognitive load early showed the normal MS effect pattern.

In a second study, Arndt et al. (1997) tested the effects of cognitive load on

worldview defense and generally found that cognitive load did mediate worldview

defense. Using the pro-US essays used by Greenberg et al. (1994), these researchers

assigned subjects to high and low cognitive loads as in the first study but added a

reinstatement conditions were subjects completed a puzzle that either primed death

related words or did not prime death related words. Generally, those subjects who

received the death puzzle, a reinstatement of MS, showed lower responses to world view

defense but when cognitive load was high and subjects had the MS reinstated by means of

the death puzzle just before evaluation of the pro-US essay showed higher levels of pro-

US bias. This research was initially designed to clarify the cognitive process activated by

the MS condition. This research has demonstrated that the MS effect is mediated by

cognitive load, so subsequent reminders of death after MS seems to reduce the effect of

MS. This implies that in order for the MS effect to be measured subjects must be actively

suppressing thoughts of death because when they were re-reminded of death through the

death-word puzzle the effects of MS decreased. Whether or not the thoughts are

unconsciously suppressed or not, MS causes first a decrease in death-thought accessibility

and then an increase in death-thought accessibility. Arndt sites an article in press by

Arndt et al. which suggests that when given subliminal MS cues (e.g. words flashed on

screen that were below awareness) subjects showed increased death-thought accessibility

and increased world view defense.

Conclusion

MS is shown to produce a considerable amount of effects such as worldview

defense (Harmon-Jones et al., 1997), increased in-group bias (Harmon-Jones et al., 1996),

preference of consistent stereotypes (Schimel et al.,1999) increased aggression and

derogation to dissimilar others (McGregor et al., 1998). Research into TMT has

consistently produced evidence that support it. TMT's view of stereotypes and prejudice

are seen as functioning to reduce anxiety caused by the awareness of death. Schimel et al.

(1999) posits that stereotypes are part of the cultural worldview. Reminders of death have

increase the need for the cultural worldview and its defense, Schimel hypothesized that

subjects would prefer the consistent stereotypic depictions of out-groups over inconsistent

depictions of out-groups. Schimel et al. has found evidence to support this hypothesis.

According to terror management theory, worldview protects against deeply rooted fear of

death. The worldview provides the world with order and meaning, provides for a self-

worth and offer some form of death protection. TMT posits that out-groups threaten the

absolute validity of the in-groups cultural worldview. In order to maintain this fragile

structure, the in-group may employ various methods to protect cultural validity. One of

these methods can involve the use of prejudice and stereotype use. Stereotypes and

prejudice can be seen as a way to maintain cultural validity through the process of

downward social comparison, which in turn held to validate the cultural worldview. The

worldview in part buffers anxiety caused by the awareness of death so stereotypes and

prejudice can be used to buffer anxiety caused by the awareness of death. Terror

management theory view of prejudice and stereotypes has received evidence in support of it. TMT suggests that reminders of death will increase access to stereotypes, increase preference for consistent depictions of out-groups over inconsistent depiction of out-groups.

. The Stroop task has a long and fruitful history in psychological research. Adaptations of the Stoop word task (1935) have been successfully used to test for automatic stereotype activation. Various adaptations of the Stroop task, proposed theories behind the interference involved in the Stroop effect as well as some examples of the Stroop task employed in social psychological research will be reviewed in the next section.

The Stroop Effect

The following section contains a descriptive report on the origins of the Stroop Effect focusing on the original Stroop article published in the <u>Journal of Experimental Psychology</u> by J. R. Stroop (1935), a report on the finding of MacLeod 's review (1991) on the Stroop Effect including more then 400 studies involving the Stoop task. Theoretical explanations of the Stroop effect are reviewed and several examples of recent applications of the Stroop task in social psychology research are given.

Cattell (1886) experimented with letters, pictures and colours testing the reaction time to respond to the stimulus. Cattell indicative of his Wundtian background was trying to measure the time taken for mental processing. Cattell reports in the journal <u>Mind</u> (1886) the following:

The time required to see and name colours and pictures of objects was determined

in the same way....[using a revolving drum]....The time was found to be about the

same (over1/2 sec,) for colours as for pictures, and about twice as long for words

and letters... we can recognise (sic) a single colour or pictures in a slightly shorter

time than a word or letter, but take longer to name it. (pg.88)

Cattell (1886) theorized that recognition of words or letters was automatic because of

repeated association between the idea (e.g. the symbol stimulus) and the name (e.g., the

acoustic symbol) and with pictures and colours we must voluntarily choose the name.

Objects and colours took longer to name out loud than the corresponding word. Even

after repeated trials the ratio between the differences remained constant. MacLeod (1991)

reports that theories put forth at the time, claimed that many responses could be

associated with colour and only one response was associated with a word. It was Stroop

(1935) who combined colours and words.

Stroop (1935) employed pairs of conflicting stimuli at the same time in which

both were "inherent aspects of the same symbols" (pg. 16). Stroop was asked his subjects

to say "green" in response to the word purple printed in *green* letters. Stroop (1935) used

the words: red, blue, green, brown, and purple and the colours corresponding to the

words. Subjects were timed while reading out loud a list of 100 words in the first of three

experiments. The first list contained the colour names in conflicting colour print and the

same colour names written in black print. Stroop reported that subjects took 2.3 seconds

longer to read the 100 colour names written in inconsistent colour print than the 100

colour names in black print. Stroop appropriately entitled his second experiment: The

effects of interfering word stimuli upon naming colors serially. Stroop used the same100

colour names written in inconsistent colour print words and blocks of colours. In this experiment, subjects were told to ignore the written symbol and report the colour e.g. if the word 'red' was printed in *blue* the correct response was blue. Stroop reported means of 63.3 seconds for colour blocks and 110.3 seconds for the inconsistent word/colour stimuli. An increase of 74 percent, when comparing these results to the results of the first study. When comparing non-interference stimuli to the interference stimuli Stroop called it a 'marked interference effect'. Stroop conducted a third experiment testing subjects over 8 consecutive days and found that practice had no impact on interference effect. MacLeod (1992) replicated Stroop's original experiment and found remarkably similar results.

Stroop Word Task Adaptations

MacLeod (1991) reported several adaptations to the original Stoop task within psychological research. MacLeod (1991) cites Teece and Dimartino (1965) as first introducing singularly presented stimuli. This modification did not change the overall interference effect. The interference effect is also produced when subjects have to sort stimuli into categories. Results from sorting studies show that subjects sort consistent colour word cards significantly faster than inconsistent coloured words. Cattell (1886) originally reported that pictures were slower to read aloud than the corresponding words. MacLeod (1991) credits Hentschel (1973) with applying pictures to the Stroop task. Interference was observed when words were embedded in pictures when subjects had to respond to the picture, incongruent words interfered with picture naming e.g. the word ankle written across a picture of a hand. Yet the word cheese written across a picture of a mouse does not produce any more interference than does an unassociated word. This

difference could due to the effects of priming associated words and semantic content where the 'ankle/hand' example shows categorical interference but no priming. The major advantage of this technique is that many more concepts are available for manipulation than colour words can offer (MacLeod, 1991). Interference has been noted in a Stroop tasks using arrows in response to words left, right, up and down. Counting is interfered with when subjects are asked to count the number of digits but disregard the actual digit themselves. When numbers are incongruent with the number of digits interference is observed e.g., 444 and the response being 3.

Klein (1964, as cited in MacLeod, 1991) demonstrated that changing the stimulus reduced the magnitude of the Stroop interference. Six stimuli conditions were used in this experiment, a colour block stimulus and inconsistent print colour names: red, green, yellow and blue. Other stimuli included the following: tan, purple, gray, and black; fire, grass, lemon, and sky; put, heart, take and friend; sol, helot, eft, and adjure; and hjh, evgjc, bhdr, and gsxrq. The mean differences reported in MacLeod (1991) are 44s, 37.5s, 18s, 15.5s, 12s, and 5s. The more meaningful the word, the more interference was reported, as the means reveal even some non-associated words produced interference. MacLeod (1991) concludes that "compared with naming the ink colour alone, irrelevant verbal stimuli unrelated to the concept of colour interfere only minimally with colour naming. However, as the word's semantic association to the concept of colour increases, so does its potential to interfere" (MacLeod, 1991, pg.173).

Priming techniques have been used in the study of linguistics and it is not surprising that the Stroop task was adapted to study language. When words such as queen were primed e.g., king, interference was observed and when priming words such as

broom with a sentence "The man swept the floor" facilitation took place and not

interference (MacLeod, 1991). To generalize, a colour-unrelated word caused interference

or facilitation if it's meaning is activated through priming (MacLeod, 1991).

There have been different methods for response used in the Stroop task.

Interference was reported by White (1969, as cited in MacLeod, 1991) to occur with

manual key responses but to lesser degree. MacLeod's conclusion about manual verse oral

response is interference is still significant for the manual condition, but interference is

reduced (MacLeod, 1991). As noted in the original Stroop article (1935) there was a

notable difference between male and female participants with women tending to respond

faster to colour response than men. MacLeod (1991) reports that although originally

posited by some early authors (e.g.,Cattell, 1886) there are no sex differences in the

Stroop effect. Age differences within the Stroop effect exist, with interference beginning

in grade school reaching its highest levels around the 3rd grade when reading skills

develop and declines in effect throughout adulthood until around the age of 60 where

there is a noted increase in the interference effect (MacLeod, 1991).

Theories of the Stroop Effect: Lexical Processing Models

Theoretical accounts of the Stroop Effect include the relative speed of processing

view as put forth by Stroop (1935), Cattell's original idea of automaticity (1886) and

McClelland's (1979) Parallel Distributed Processing Model. The relative speed of

processing view began with Cattell's (1886) observation that colours took longer to name

than words. The differences in the speed of processing are important because two

processes are competing for response. One response is to say the word and the other

response is to identify the colour, and these two potential responses compete, thereby causing interference. Although this theory can account for much of the effects of the Stroop Effect it is generally not considered valid (MacLeod, 1991). As noted earlier, Cattell (1886) proposed that written words are strongly associated with the acoustic symbol, which is automatic, on the other hand, colours draw more on sensory resources. The automaticity view of the Stoop effect according to MacLeod (1991) does not give an adequate account for a comprehensive nature of the Stroop yet may still be viable. These two theories work on the principle of response competition.

Although the summaries of the above-mentioned theories are oversimplifications of the theories and are both considered flawed in some respect, some components of these two theories are incorporated into the Parallel Distributed Processing Model (e.g., Seidenberg, & McClelland, 1986). This explanation of the Stroop Effect develops from a model of visual word recognition. The basic premise of this model states that orthographic, phonological, semantic and contextual associations are all activated together during lexical processing, and therefore compete with one another causing interference. There are many models of visual word recognition such as Morton's Logogen Model (e.g., Morton, 1969) another model developed Forster (e.g., Forster, & Bednall,1976) called Autonomous Search Model. All these models have flaws and a generally complex, and no one of these models is generally accepted within the literature. Parallel Distributing Processing Model (PDP) explanation of the Stroop Effect involves activation of different pathways with varying strengths and levels of automaticity. An oversimplified explanation of PDP is as follows: pathways in the model are interconnected and when two pathways are activated simultaneously they produce

conflicting information at their intersections with interference resulting. If on the other hand, two pathways are activated together a non-conflicting result is produced so facilitation will occur. Interactions can occur at any time during processing and there can be multiple connection with facilitation or interference happening at the same time. All these pathways are influenced by the strength of the connection, which are influenced by learning and there are several pathways that exist (e.g., orthographic, phonological, contextual and semantic).

Some research has employed the Stroop task with some interesting adaptations and assumptions. Gotlib & McCann (1983) used a Stroop task involving words that described affect e.g. happy, sad. These researchers developed two lists of words one containing words which were consistent with negative mood associated with depression and the other word list contained words associated with the positive affects of mania. The researchers had depressed subjects respond to the word lists in the traditional Stroop task by identifying the print text. These two researchers found that depressed individuals took longer to respond to the print colour of words that were incongruent with how they felt, i.e. happy than in comparison to words that were congruent with their mood i.e., sad. This effect is produced by emotional interference and interference based on congruent/incongruent information.

Kawakami et al.(2000) research involved examining the effects of training in negating stereotype associations on stereotype activation. Subjects responded to the colour print of negative stereotypes relating to skinhead and seniors. Interference was produced by the semantic meaning of the word. The greater the activation of semantic meaning the greater the interference because of the increased amount of processing

resources needed to inhibit the semantic context which therefore slows the response of colour naming (Kawakami et al., 2000). The PDP model posits that semantic processing occurs automatically along with the factors involved in processing and occurs despite the participants' processing goal (e.g., colour response). Subjects are not asked to process the word, but the subjects are unable to eliminate the interference by ignoring the meaning of the words. Meaning is activated along with colour thus interference is the result (MacLeod, 1991; Kawakami et al., 2000). The Stroop task in this study involved a priming technique. Subjects had the target words primed in black ink (e.g., skinhead or senior) for 950 ms followed by a blank screen for 50 ms before the target word appeared. The target words consisted of 8 stereotypes for each group (e.g. weak for seniors and hostile for skinheads). A voice activation procedure was used to measure the response latency time. Due to the nature of the data, transformations were needed for proper analysis of variance. These researchers established a base rate for the stereotype activation by using response latency means. Negation training was the independent measure. After the treatment, subjects preformed the Stoop task. The means were compared to determine whether or not the treatment was effective.

These two examples, indicate the adaptive nature of the Stroop task and it's importance within social psychology research. Although the Stroop Effect was virtually ignored for almost 30 years (MacLeod, 1992) it may have been a result of the dominate theory at the time: behaviourism. At that time, cognitive processes were not considered to be within the realm of psychological research. Once cognitive theories became more readily accepted, the Stroop task surged with a vengeance. MacLeod (1992) reports that over 700 studies have employed the Stoop task. It seems to be a widely used test and its

robustness in terms of the interference effect seems to make it an appropriate tool to

investigate cognitive processes within social psychology, language acquisition, clinical

diagnosis and stereotype activation.

Reference

Adorno, T., Frenkel-Brunswick, E., Levinson, D., & Sanford, N. (1950). The Authoritarian Personality. New York: Harper

Allport, G. (1954). The Nature of Prejudice. Cambridge, MA: Addison-Wesley.

Arndt, J., Greenberg, J., Solomon, S., Pyszczynski, T., & Simon, L. (1997). Suppression, accessibility of death-related thoughts, and cultural worldview defense: Exploring the psycho-dynamics of terror management. Journal of Personality and Social Psychology, 73, 1, 5-18.

Bandura, A. (1977). Social Learning Theory. Englewood Cliffs, NJ: Prentice-Hill.

Becker, E. (1962). The Birth and Death of Meaning. New York: Free Press.

Becker, E. (1973). The Denial of Death. New York: Free Press.

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, 1, 35-45.

Cattell, J. (1886). The time taken up by cerebral operations. Mind: A Quarterly Review of Psychology and Philosophy, 11, 63-65.

Devine, G. (1989). Stereotypes and prejudice: Their automatic and controlled components. Journal of Personality and Social Psychology, 56, 5-18.

Dovidio, J., Brigham, J., Johnson, B., & Gaertner, S. (1996). Stereotyping, prejudice, and discrimination: Another look. In N. Macrae, C. Stangor, & M. Hewstone (Eds.), Stereotypes and Stereotyping (pp. 1276-1319). New York: Guilford.

Fein, S., & Spencer, S. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. Journal of Personality and Social Psychology, 73, 1, 33-44.

Feldman, J. (1972). Stimulus characteristics and subject prejudice as determinants of stereotypes attribution. Journal of Personality and Social Psychology, 21, 333-340.

Ford, T., & Stangor, C. (1992). The role of diagnosticity in stereotype formation: Perceiving group means and variances. Journal of Personality and Social Psychology, 63, 3, 356-367.

Forster, K., & Bendall, E. (1976). Terminating and exhaustive search in lexical access. Memory and Cognition, 4, 53-61.

Franzoi, S., & Shields, S. (1984). The Body-Esteem Scale: Multidimensional structure and sex differences in a college population. Journal of Personality Assessment, 48, 3, 173-206.

Gilbert, D., Hixon, J. (1991). The trouble of thinking: Activation and application of stereotype beliefs. Journal of Personality and Social Psychology, 60, 4, 509-517.

Greenberg, J., Pyszczynski, T., Solomon, S. (1986). The cause and consequence of the need for self-esteem: A terror management theory. In R.F. Baumeister (Ed.), Public Self and Private Self (pp. 189-212). New York: Springer-Verlag.

Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management II; The effects of mortality salience on reactions to those who threaten of bolster the cultural worldview. Journal of Personality and Social Psychology, 58, 2, 308-318.

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., & Simon, L. (1992). Why do people need self-esteem? Converging evidence that self-

esteem serves an anxiety-buffering function. Journal of Personality and Social

Psychology, 63, 913-992.

Greenberg, J., Pyszczynski, T., Solomon, S., Pinel, E., Simon, L., & Jordan, K. (1993).

Effects of self-esteem on vulnerability-denying defensive distortions: Further evidence of

an anxiety-buffering function of self-esteem. Journal of Experimental Social Psychology,

29, 229-251.

Greenberg, J., Pyszczynski, T., Solomon, S., Simon, L., & Breus, M. (1994). Role of

consciousness and accessibility of death-related thoughts in mortality salience effect.

Journal of Personality and Social Psychology, 67, 4, 627-637.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-

esteem and cultural worldviews: Empirical assessments and conceptual refinements.

Advancements in Experimental Social Psychology, 29, 61-136.

Goldenberg, J., McCoy, S., Pyszczynski, T., Greenberg, J., & Solomon, S. (2000). The

body as a Source of self-esteem: The effects of mortality salience on identification with

one's body, interest in sex, and a appearance monitoring. Journal of Personality and

Social Psychology, 79, 1, 118-130.

Goldenberg, J., Pyszczynski, T., Greenberg, J., Solomon, S., Klunk, B., & Cornwell, R.

(2001). I am not an animal: Mortality salience, disgust, and the denial of human

creatureliness. Journal of Experimental Psychology: General, 130, 3, 427-435.

Gotlib, I., & McCann, C. (1983). Construct accessibility and depression. Journal of

Personality and Social Psychology, 72, 428-439.

Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor,

H. (1997). Terror management theory and self-esteem: evidence that increased self-

esteem reduces mortality salience effects. Journal of Personality and Social Psychology, 72, 1, 24-36.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on inter-group discrimination between minimal groups. European Journal of Social Psychology, 26, 677-681.

Hastie, R. (1984). Causes and effects of causal attribution. Journal of Personality and Social Psychology, 46, 44-56.

Hentschel, U. (1973). Two new interference tests compared to the Stroop color word task. Psychological Bulletin, 13, -1-24 as cited in MacLeod, C. (1991). Half a century of research on the Stroop effect: An integrative review. Psychological Bulletin, 109, 2, 163-203.

Jussim, L., Coleman, L., & Lerch, L. (1987). The nature of stereotypes: A comparison and integration of three theories. The Journal of Personality and Social Psychology, 52, 3, 536-546.

Kawakami, K., Dion, K., & Dovidio, J. (1998) Racial prejudice and stereotype activation. Personality and Social Psychology Bulletin, 24, 407-416.

Kawakami, K., Dovidio, J., Moll, J., Hermsen, S., & Russin, A. (2000). Just say no (to stereotypes): Effects of training in the negation of stereotypic associations on stereotypes activation. Journal of Personality and Social Psychology, 76, 5, 871-888.

Kelley, H.(1972). Attribution in social cognition. In E.E. Jones et al. (Eds.), Attribution: Perceiving the Cause of Behavior. (pp.1-26) Morristown, NJ: General Learning Press.

Klein, G. (1964). Semantic power measured through the interference of word color-naming. American Journal of Psychology, 77, 567-588, as cited in MacLeod, C. (1991).

Half a century of research on the Stroop effect: An integrative review. Psychological

Bulletin, 109, 2, 163-203

Kunda, Z. (1987). Motivated inference: Self-serving generalization and evaluation of

causal theories. Journal of Personality and Social Psychology, 53, 636-647.

Kunda, Z., & Oleson, K. (1995). Maintaining stereotypes in the face of disconfirmation:

Constructing grounds for subtyping deviants. Journal of Personality and Social

Psychology, 68, 4, 565-579.

Kunda, Z., & Oleson, K. (1997). When expectations prove the rule: How extremity of

deviance determines the impact of deviant examples of stereotypes. Journal of Personality

and Social Psychology, 72, 5, 965-979.

Kruglanski, A., Webster, D., & Klem, A. (1993). Motivated resistance and openness to

persuasion in the presence or absence of prior information. Journal of Personality and

Social Psychology, 65, 861-876.

Linville, P. (1982). The complextity-extermity effect and aged-based stereotyping.

Journal of Personality and Social Psychology, 41, 193-211.

Lopes, L. (1983). Some thoughts on the psychological concept of risk. Journal of

Experimental Psychology: Human Perception and Performance, 9, 137-144.

MacDonald, T., Zanna, M., & Fong, G. (1996). Why common sense goes out the

window: Effects of alcohol on intentions to use condoms. Personality and Social

Psychological Bulletin, 8, 763-775.

MacLeod, C. (1991). Half a century of research on the Stroop effect: An integrative

review. Psychological Bulletin, 109, 2, 163-203.

MacLeod, C. (1992). The Stroop task: The "gold standard" of attentional measures.

Journal of Experimental Psychology: General, 121, 1, 12-14.

McGregor, H., Lieberman, J., Greenberg, J., Solomon, S., Arndt, J., Simon L., &

Pyszczynski, T. (1998). Terror management and Aggression: Evidence that mortality

salience motivates aggression against worldview-threatening others. Journal of

Personality and Social Psychology, 74, 3, 590-605.

McKinley, N., & Hyde, J. (1996). The Objectified Body Consciousness Scale.

Psychology of Women Quarterly, 20, 181-215.

Morton, J. (1969). Interaction of information in word recognition. Psychological Review,

76, 165-178.

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989).

Evidence for terror management theory 1: The effects of mortality salience on reactions to

those who violate or uphold cultural values. Journal of Personality and Social

Psychology, 57, 681-690.

Seidenberg, M., & McClelland, J. (1989). A distributed development model of visual

word recognition and naming. Psychological Review, 96, 523-568.

Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., &

Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience

enhances stereotypic thinking and preferences. Journal of Personality and Social

Psychology, 77, 5, 905-926.

Sinclair, L., & Kunda, Z. (1999). Reactions to a Black professional: Motivated inhibition

and activation of conflicting stereotypes. Journal of Personality and Social Psychology,

77, 5, 885-904.

Sherif, M., Harvey, D., White, B., Hood, W., & Sherif, C. (1961). The Robbers' Cave Experiment. Norman, OK: Institute of Group Relations.

Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldview. In M.P. Zanna (ed.), Advances in Experimental Social Psychology, (vol. 24). New York: Academic Press.

Stroop, J. (1935). Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 18, 643-622.

Tajfel, H. & Turner, J. (1979). An integrative theory of the inter-group conflict. In W.G. Austin & S. Worchel (Eds.), The Social Psychology of Inter-group Relations (pp. 33-47). Monterey, Ca: Brooks & Cole.

Tajfel, H., Billig, M., Bundy, R., & Flament, C. (1971). Social categorization and inter-group behavior. European Journal of Social Psychology, 1, 149-178.

Tecce, J., & Dimartino, M. (1965). Effects of heightened drive (shock) on performance in a tachistoscopic color-word interference task. Psychological Reports, 16, 93-94, as cited in MacLeod, C. (1991). Half a century of research on the Stroop effect: An integrative review. Psychological Bulletin, 109, 2, 163-203

von Hippel, W., Sekaquaptewa, D., & Vargas, P. (1997) The linguistic inter-group bias as an implicit indicator of prejudice. Journal of Experimental Social Psychology, 33, 490-509.

White, L. (1969). Interference in identifying attributes and attribute names. Perceptions and Psychometrics, 6, 166-168, as cited in MacLeod, C. (1991). Half a century of

research on the Stroop effect: An integrative review. <u>Psychological Bulletin</u>, 109, 2, 163-

203

Wegner, D. (1994). Ironic processes of mental control. <u>Psychological Review</u>, 101, 34-

52.

Running Head: STEREOTYPES AND MORTALITY SALIENCE

Stereotypes and Mortality Salience: Evidence Supporting Terror Management Theory's

View of Stereotype and Prejudice

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Thesis Paper

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Abstract:

This study investigates the effects of MS on access and preference of stereotypes, predicting that MS will influence the preference for stereotype consistent depiction of cultural groups. Subjects completed a gender-role behaviour preference scale and a primed Stroop color-word task using consistent and inconsistent cultural stereotypes. Self-esteem is predicted to reduce the preference for stereotype consistent groups and gender-role behaviour. Subjects were further divided into high/low self-esteem creating a 2 (mortality salience: death/dental) X 2 (self-esteem: High/Low) X 3 (neutral vs. consistent vs. inconsistent) Pre/post state-anxiety tests and two death-thought accessibility scales were used to measure the effects of the independent variable. Results for the Stroop task are consistent with terror management theory and predictions. Self-esteem was found to have no effects on stereotype preference

Stereotypes and Mortality Salience: Evidence Supporting Terror Management Theory's

View of Stereotype and Prejudice

Prejudice, mainly negative attitude towards members of a specific group based

solely on their membership in that group, function as cognitive schemas, that help to

organize, process and recall information about members of groups. Stereotypes, over-

generalized and usually negative beliefs about groups have long been believed to be an

important contributor to prejudice, discrimination and inter-group conflict (Allport, 1954;

Kawakami et al., 1998; Dovidio et al., 1996). Due to the negative actions that prejudicial

discriminations produce, prejudice and stereotypes have been investigated from various

theoretical frameworks (e.g., Allport, 1954; Farfel & Tuner, 1979; Jessie, Coleman, &

Larch, 1987).

Realistic-conflict theory (e.g., Sheriff et al., 1961), social learning theory (Bandera,

1977) and social categorization (Farfel & Tuner, 1979) hypothesize the cause and origin

of prejudice. Prejudice is also theorized to stem partially from social cognition, in which

stereotypes have a strong influence on how we make social judgments. From a social

cognition perspective, stereotypes function as a form of heuristic to give quick, precise

and possibly useful information about out-groups. Devine (1989) found that when Black

stereotypic words were subliminally primed both high and low prejudice White

participants interpreted ambiguous behavior in stereotypic ways. Devine (1989) further

found that high prejudice Whites used more negative stereotypes than did low prejudice

Whites, showing conscious inhibition of stereotype activation by low prejudice White

participants. Kawakami et al., (1998) using a pronunciation task under automatic and

controlled processing conditions produced results consistent with Devine (1989). In a meta-analytic review of the literature regarding prejudice and stereotypes, Dovidio et al. (1996) found that individual differences in stereotyping were significantly related to prejudice but the effect size was small ($d = .25$) and highly variable across studies. Devine (1989) and Kawakami et al., (1998) have shown that stereotypes are easily activated among individuals differing in racial prejudice. Regardless of the level of prejudice, individuals can equally access and be aware of cultural stereotypes, which suggest that stereotypes have functions beyond prejudice and prejudicial discrimination.

Another function of prejudice and stereotypes proposed by terror management theory (e.g., Greenberg, Pyszczynski, & Solomon, 1986) suggest that prejudice and stereotypes are used to help protect against the fear of human mortality. According to terror management theory (TMT) individuals derive a personalized concept of reality based on the prevailing cultural worldview providing the universe with order, meaning and purpose, which helps protects against existential fears. When these existential fears are made more salient it is theorized that individuals will be committed to maintaining their cultural worldview and will disparage those who oppose their worldview. TMT suggest that out-group members are threatening because they hold different worldviews, which threatens the validity of the in-group's cultural validity. From this line of reasoning, prejudice and stereotype may function as a way to maintain cultural validity. TMT suggests that reminders of mortality will increase the need to perceive out-group members in stereotypical ways, leading to the preference of consistent depictions of out-group members. This study tests the hypothesis that reminders of death (mortality salience) will

increase the access and preference for consistent stereotypical depictions of out-groups over inconsistent depictions of out-groups.

Terror Management Theory

TMT, based on the works of cultural anthropologist Ernest Becker (e.g., 1973), proposes that the unique human ability to be cognizant of the inevitability of our mortality is juxtaposed by our biological instinct for continued existent, which can produce extreme fear and terror. TMT posits that cultural ideas in part help to protect against this rudimentary human fear. According to TMT, we buffer existential fear through a two-part system consisting of a cultural worldview and self-esteem. First, the cultural worldview protects against death anxiety by providing the individual with a stable, predictable, meaningful construction of reality, a value system that allows the individual to attain a sense of personal self-value and some form of death transcendence, either literal or symbolic. Second, self-esteem protects against death anxiety. Self-esteem from a TMT perspective is derived from the belief in the absolute validity of the cultural worldview, that one is living up to the values of the culture and is an object of primary value. Culture and self-esteem protect against fear and anxiety caused by the awareness of death and is of great importance to the individual, which results in social behavior devoted to maintaining and defending these constructs.

The empirical research involving TMT has focused on two primary hypotheses (1) mortality salience (MS) or thinking about death increases the need for the cultural worldview and its defense and (2) self-esteem and the cultural worldview provide protection from anxiety caused by the awareness of death. Over 75 separate experiments

(Goldenberg et al., 2000; for review see, Greenberg et al., 1997) have tested and support variations of these two hypotheses. Self-esteem has been shown to reduce anxiety caused by graphic depictions of death, reduce galvanic skin response to the threat of painful electric shock, and reduce the need to deny the possibility of an early death (Greenberg et al., 1990; Greenberg et al., 1992; Greenberg et al., 1993). Various studies have also shown that self-esteem reduces the effects of mortality salience on worldview defense (e.g., Harmon-Jones et al., 1997; Greenberg et al., 1990).

Research testing the mortality salience hypothesis (e.g., reminders of death increase the need to defend the cultural worldview) has shown that support of the cultural worldview leads to more positive evaluation of individuals therefore ideas and that opposition of the worldview leads to more negative evaluation of individuals and ideas (e.g., Greenberg et al., 1990; McGregor et al., 1998). MS has also increased aggression towards worldview threatening others, increased the need to disparage and distance oneself from out-group members (McGregor et al., 1998; Harmon-Jones et al., 1996). The effects of mortality salience seems to be specific to reminders of death and other anxiety provoking stimuli do not produce these effects (Greenberg et al., 1994).

A Terror Management View of Stereotype and Prejudice

TMT views the cultural worldview as a fragile construct, which is constantly in need of validation by its members. The fact that other groups have different worldviews calls into question the absolute validity of this fragile structure. The maintenance of the in-groups culture's validity should involve the rejection of out-group members, their values and their cultural structures because when the in-group cultural worldview is in doubt, it

can no longer function effectively as a buffer for anxiety caused by the awareness of death.

Research from a TMT perspective is consistent with these concepts. TMT research has

shown that individuals who hold different worldviews increase the likelihood that they will

be responded to with increased aggression and hostility. Greenberg et al., (1990) found

that reminders of death increased attraction to worldview sharing others (e.g., Christians)

but decreased attraction to out-group members (e.g., Jews). This study also revealed

increased derogation of out-group members (e.g., attributing more negative stereotypic

traits to Jew, i.e., cheap) when participants were reminded of their death, but this was not

the case for the control subjects (who were not reminded of their death). McGregor et al.,

(1998) found that individuals when confronted with worldview inconsistent ideas

responded with either increased aggression or disparaging remarks to the holder of these

worldview-threatening ideas. Also consistent with the hypotheses that MS increases the

need to defend cultural validity, Schimel et al., (1999) found that MS increased the

stereotypical depictions of Germans, increased liking for a consistent stereotypic African

American and decreased liking for an inconsistent stereotypic African American. This

study also found that reminders of mortality lead to an increased tendency to explain away

inconsistent gender-role behaviour.

Hypotheses

Schimel et al., (1999) states that stereotypes are a part of the cultural worldview

that provides protection from anxiety caused by the awareness of death. Reminders of

death are then hypothesized to increases the use of stereotypes. The purpose of this paper

is to test the hypothesis that reminders of death will increase access and preference for the

consistent depiction of out-groups over inconsistent depiction of out-groups. Self-esteem

has been shown to reduce the need to defend the cultural worldview (McGregor et al.,

1998) and MS effects in general and therefore it is also hypothesized that high self-esteem

will reduce the tendency to prefer stereotypic depictions of out-groups. A further

hypothesis of this paper is that anxiety produced by awareness of death is specific to

thoughts of death and that anxiety produced by other means (e.g., going to the dentist)

will not increase stereotypic thinking. Research by Arndt et al., (1997) has shown that

individuals actively try to inhibit thoughts about death. This study is also designed to test

the hypothesis that active suppression of death related thoughts occurs when individuals

are reminded of their mortality.

The Stoop task (Stroop, 1935) has had a long and fruitful history in psychological

research with over 700 studies employing this task (for review see, MacLeod, 1991). The

Stroop task has been successfully adapted to investigate stereotypes, for example

Kawakami et al., (2000) examined the effects of training in negating stereotype association

on stereotype activation. Participants responded to the colour print of negative stereotype

words of seniors and skinheads. Latency to respond was the dependent measure. A base

line of stereotype activation was established, training was manipulated and subjects were

re-tested. Interference caused by the semantic meaning of the word slowed response time

and response latency was an indicator that activation of stereotypes occurred and was

used to judge the effectiveness of training. Gotlib & McCann (1983) used an adaptation of

the Stroop task to investigate clinically depressed patients by having subjects respond to

the print colour of words involving affect (e.g., sad, happy) and found that depressed

individuals took longer to identify the print colour of words which were incongruent with how they felt (i.e., happy).

The present research uses a primed Stroop word task to investigate the hypotheses that MS increases access and preference for stereotypic depictions of out-groups and takes the view that inconsistent stereotypes will produce longer response latency times because they will be incongruent with expectations. MS is hypothesized to increase access to consistent stereotypic depiction of out-groups but will cause cognitive interference and increase response latency time for inconsistent depictions of out-groups. Also included in this present study is a gender-role behaviour sentence completion task, which is an adaptation of Hastie (1984) and von Hippel, Sekaquaptewa, & Vargas (1997) that tests for biased attributional responses when subjects encounter inconsistent gender-role behaviour. If subjects chose to complete the partial sentence i.e., "Mary carried all the heavy luggage" in a way that explains away the inconsistent behaviour i.e., "because her husband had broken his back" it was assumed that subjects were showing preference for consistent gender-role behaviour. The use of this measure was an attempt to replicate the findings of Schimel et al., (1999) that mortality salience increases the tendency to generate more explanations for gender-role inconsistent behaviour.

Method

Participants

Fifty female and twenty male undergraduate students at Algoma University College in Sault Ste. Marie, Ontario enrolled in three different first and second year

psychology classes were solicited during regular class hours and were give partial course

credit for their participation in a 45-minute experimental session.

Materials

Each subject received a package containing several paper and pencil measures and

instructions on how to complete them. The package contained the following measures

listed below.

A demographic questionnaire.

A self-esteem scale: Self-Esteem Rating Scale (SERS) developed by Nugent &

Thomas, (1993). The SERS is forty item inventory using a 7-piont Likert scale with a

score range from -120 to + 120 and an internal consistency an alpha of .97, and a standard

error of 5.67. The SERS is reported to have good construct validity and content validity

(Nugent & Thomas, 1993).

A split-half state anxiety scale: State Trait Anxiety Inventory (STAI) Form Y-1

and Y-2 developed by Spielberger, (1977). STAI Form Y-1 and Y-2 have means of 37

and 39 and standard deviation of 11 and 9.7, respectively. The STAI Form Y-1 and Y-2

consist of 20 items each and use a 4-piont Likert scale.

The death and dentist manipulations consisting of four open ended questions that

read as follows: "Please briefly describe the thoughts and feeling that the thought of your

own death [going to the dentist] arouses in you" and "Jot down as specifically as you can

what you think will happen to you as you die [at the dentist] and once you are dead [in the

dentist chair]" (Rosenblatt, 1989; Greenberg et al., 1995).

Two death-thought accessibility measures that consisting of 22 word fragments

each. Six of the 22 words could be completed in a death related way, e.g., gr____ could

be completed to make the death related word gr*ave*. This measure was an adaptation of

measures used by Greenberg et al., (1994) and Arndt et al., (1997). Death related words

for measure 1 were coffin, bury, skull, grave, coroner, funeral and for measure two were

dead, killed, murder, mourn, morgue, and stiff. The death-related words were spaced

evenly amongst the non-death related words.

Reading material containing five pages from the book Sauces: Classical and

Contemporary Sauce Making by James Peterson (1998), about cooking utensils, which

contained no references to stereotypes, ethnicity, or death.

A gender-role behaviour sentence completion task (Hastie, 1984; von Hippel et al,

1997; Schimel et al, 1998) consisting of 22 incomplete sentences. All the sentences began

with a common male or female name. Six sentences depicted male and female consistent

gender-role behaviour (i.e., Steve studied the engineering manual, Diane washed the

dishes), 6 sentences depicted male and female inconsistent gender-role behaviour (i.e.,

Mary paid for dinner, Steve feed the baby) and 10 sentences depicted neutral behaviours

(i.e., Ken watched TV, Stacy ate supper).

A constructed death questionnaire consisting of 12 statements. Using a 7-piont

Likert scale, this questionnaire measured how often subjects thought about death, the

amount of affect that thinking about their own death caused and their level of religiosity.

Apparatus

A standard computer lab with 8 tables holding 15 PC's using Windows RT 98 was

used as the experimental lab. The lab was a large open room containing several windows

and had one entrance and most subjects were acquainted with the lab.

A computer program designed to run on Windows 98 was used for the computerized primed Stroop word task. This program contained written, visual and interactive instructions necessary for the completion of the task. The Stroop task displayed target words (i.e., social, ethnic group) in black bold capital font to the right of center in the upper middle portion of the computer screen. Trait words (stereotype words associated with the target or it's opposite) appeared slightly to the left of the target one second after the target appeared. The trait word appeared in the same font as the target but in one of four colours: red, blue, green and purple. At the bottom of the screen there appeared at all times a box divided into four equal compartments, which were coloured red, blue, green or purple. In the center of the box was a button labeled "Next". When the "Next" button was clicked on using the cursor and the mouse button, a target word would immediately appear and one second later a trait word would appear to the left of the target word. Colours were randomly assigned to the trait words. Both the target and trait word remained on the screen until a response was made. The "Next" button was located in the middle of the colour box and had to be clicked on for the target word to appear and therefore the mouse cursor was approximately in the center of the colour box when the target words appeared. Responses were timed in milliseconds from the moment the trait word appeared on the screen to the moment a colour was clicked on within the box. The target words used in the Stroop task consisted of nineteen groups that included ethnic, gender, sexual orientation, age, social and occupation groups. Each target was paired with the a very common negative stereotype as well as its opposite. For example, lawyer was paired with crooked (consistent stereotype) and honest (inconsistent stereotype). Nineteen neutral word pairs were used (i.e., light house) for comparison and were presented in the

same manner as the consistent and inconsistent stereotypes word pairs. Nineteen word

pairs were used for each of the neutral, consistent stereotype and inconsistent stereotype

conditions (see appendix A for a complete list of words) for a total 57 word pairs, which

were presented randomly, following the rule that no more than two of the same type of

paired words would appear in a row. All three word lists (neutral, consistent and

inconsistent) had the same total number (333) of letter characters.

Procedure

Participants were run in groups of 2 to 9 and were randomly assigned to

conditions in a 2 (mortality salience: death vs. dentist) X 2 (self-esteem: low vs. high) X

3 (stereotype: neutral words vs. consistent stereotype vs. inconsistent stereotype) mixed

factorial design. The Stroop task words were treated as a within subjects variable. The

first session was assigned a condition by a flip of a coin and the next session was given the

opposite condition, this process was repeated five times for all 10 sessions. Approximately

equal numbers of participants were run for each condition, thirty-eight participants were in

the death condition and thirty-two were in the dental condition, n = 70.

Upon arrival at the experiment, participants were greeted by the experimenter,

given a large package containing the experimental measures and asked to sit at one of the

computer stations. Subjects were evenly spaced to provide a sense of privacy and so

participants could not see each other's computer screens. After giving their written

consent, the experimenter told the subjects that they would be taking part in an experiment

about personality traits and memory for his honours' thesis. Participants were told to

complete the first portion of the paper and pencil measures contained in the package. They

were told that at some point during the experiment, written instructions would prompt

them to enter a letter-number code into the computer. Subjects were told to follow the

written instructions that would appear on the screen. The letter-number code matched

their paper and pencil measures with their computerized Stroop task scores. After these

verbal instructions, participants were told that the experimenter would be waiting outside

the room and to begin their package. The experimenter viewed the subjects through a

window to ensure that subjects completed the measures in the order specified. The

window was covered to ensure privacy but a small viewing space allowed the

experimenter to see into the lab. Even thought proper instructions were given two subjects

completed the Stroop task before starting the paper and pencil manipulations and

subsequently their data was not used in the analysis. After the experimental session, a

third subject reported that he was red-green colour blind and his data was also excluded.

The first page of the packaged materials contained a statement ensuring the

participants that all data was anonymous and confidential and reported data would be

expressed in means and percentiles. Participants were informed that simple written

instructions would guide them through the printed material and were asked to fill out a

demographic questionnaire for statistical purposes. Subjects were then instructed to

complete the self-esteem scale inventory and the pre-test state anxiety scale inventory

(Form Y-1). Next subject received the independent measures, either two open ended

questions asking about their thoughts and feelings aroused by thinking about their own

death or going to the dentist. Both conditions were hypothesized to produce anxiety and

to test the hypotheses that MS effect is specific to thoughts of death and not to anxiety in

general. After the manipulations subjects completed one of the death-thought accessibility

tasks. Subjects were instructions to complete each word fragment to make an actual English word and to give their first response not spending very much time on any one word fragments.

Subjects were then instructed to read the 5-paged article on cooking utensils. To be consistent with the cover story that the experiment was about memory, subjects were told that they would be asked to answer a few basic questions about the content of the article later in the experiment. Participants were further instructed to read at their normal reading speed rather than study the material. Terror management research has consistently found that the effects of MS occur only after death related thoughts are no longer active (Greenberg et al., 1994, Arndt et al., 1997) suggesting that a delay of approximately 5 to 7 minutes is effective. The reading material was designed so at average reading speed it would take between 5 and 7 minutes to complete.

After the reading material, subjects completed the first dependent measure, the gender-role sentence completion task consisting of 22 unfinished sentences. Subjects were told to complete the sentences as quickly as possible by giving their first response with the only stipulation being that the response make a complete sentence.

Subjects after completing this measure were instructed to enter a letter-number code, written at the bottom of their page (and on the outside of each subject's package) into the computer and follow the instructions that appeared on the screen. Instructions informed the subjects on how to complete the Stroop task (the second dependent measure). Subjects were told that a word in black ink would appear in the upper middle portion of the screen, slightly to the right of center. Subjects were asked to read this word silently. Further instructions explained that a second word printed in colour font would

appear to the left of the first word one second after the first word appeared. Subjects were

instructed to indicate the colour of the trait word by using the mouse to move the cursor

within the colour box to the corresponding colour and clicking on the mouse button.

Subjects were told to do this a quickly as possible without reading the trait word. Subjects

were further told to complete the entire task as fast as possible by leaving little time

between responses and clicking the next button. Subjects were shown an interactive visual

of the task before the test began. Upon completing the Stroop task containing the 57

word-pairs instructions appeared asking the subjects to finish the paper and pencil

measure. Subjects completed the second death-thought accessibility task, which used

different death related and neutral words. If individuals actively try to suppress deaths

once they are activated, subjects in the death condition should have significantly less

death-related words than the dental condition. Subjects completed the second part of the

split-half anxiety scale (STAI Y-2) and the death questionnaire. Subjects were then

instructed to place all materials back into the package and seal it and to place it with other

such packages in a box by the door on their way out of the experimental lab. Subjects

were debriefed individually or in-groups by the experimenter who was waiting outside the

experimental lab. Subjects were first probed for suspicion before being told the true nature

of the research. Due to the explicit nature of the stereotypes used in the Stroop task

subjects generally concluded that the experiment was about stereotypes yet were unaware

of the death manipulation's purpose. The experimenter explained that neither he nor

Algoma University endorsed the stereotypes used in the experiment but unfortunately to

study stereotype activation it was necessary to include such negative examples.

Participants were thanked for their time and participation.

Results

Response latencies related to errors and outlier latencies that were more than twice

times the mean for the specific word list (e.g., neutral, consistent or inconsistent) were

removed and replaced with the mean for that list. Forty-one responses of the 3990

responses representing 1.02% of the total were replaced in this manner.

The self-esteem condition (high/low) was established by using a median split

resulting in 35 subjects for each condition. Subject scores on the SERS ranged from -1 to

+100 with a mean score of 56.41, a standard deviation of 20.96 and a median score of 58.

To examine the effects of mortality salience and self-esteem on access and

preference of stereotypes, a 2 (mortality salience: death vs. dentist) X 2 (self-esteem: low

vs. high) X 3 (stereotype: neutral words vs. consistent stereotype vs. inconsistent

stereotype) multivariate analysis of variance was preformed. All three word lists were

considered separate dependent variables, because it is unlikely the sphericity assumption of

the repeated measures design was meet. Therefore MANOVA was chosen to avoid

sphericity.

The multivariate analysis of variance revealed a main effect for condition for the

inconsistent list , $F(1,62)= 4.003$, p= .050. For the death condition the means and standard

deviations for the word lists were as follows: neutral=17.421 (sd=4.88), consistent=

17.942 (sd=5.24) and the inconsistent=18.035 (sd=5.62). For the dental condition the

means and standard deviations for the word lists were as follows: neutral=17.229

(sd=2.97), consistent=17.459 (sd=2.89) and inconsistent=17.274 (sd=3.08). Pairwise

comparison reveals a significant difference between the death and dental condition for the

inconsistent list, p=.050. There were no differences found between the death and dental condition for the neutral and consistent word lists. As predicted, the death condition subjects had significantly longer response latency times for the inconsistent word list than the dental condition subjects. No interference was found in the neutral or consistent word lists by either group (see appendix B).

The analysis for condition by esteem revealed no significant effects for the neutral word list, p=.492, consistent word list, p=.229, and the inconsistent word list, p=.580. The hypothesis that esteem effects stereotype access and preference was not supported. The effect of self-esteem revealed significant main effects for the neutral list, F (1,62)= 5.945, p=.018 and the inconsistent list, F (1,62)= 7.087, p= .010. High self-esteem subjects had a mean for the neutral word list of 18.844, a mean for the consistent word list of 19.070 and a mean for the inconsistent word list of 19.518. Low self-esteem subjects had means of 16.141, 16.843, and 16.270, respectively. Pairwise comparisons reveal that the neutral and inconsistent word lists for high self-esteem subjects had response latencies significantly longer than the low self-esteem, p=.017 and p=.012, respectively and approaching significance for the consistent list, p=.060. Low self-esteem subjects had considerable faster response latency times than the high self-esteem subjects for neutral and inconsistent word lists. These results were not predicted and unexpected.

A significant gender by condition interaction has found for the inconsistent word list, F(1,62)=5.845, p=.019. Male subjects in the death condition had a mean for the inconsistent list of 21.009, male subjects in the dental condition had a mean of 15.605. This was not expected nor predicted result. The omnibus test revealed no other significant interactions but pairwise comparison revealed a three-way interaction. Pairwise

comparisons revealed a significant gender by esteem by condition interaction. Males in the high self-esteem/death condition had significant longer response latency times compared to males with low self-esteem/death condition in all three word lists: neutral (p=.054), consistent (p=.013) and inconsistent (p=.013). Males in the high self-esteem/death condition had means for the neutral, consistent and inconsistent list as follows: 22.636, 23.353, and 24.666, respectively. Males with low self-esteem/death condition had means for neutral, consistent and inconsistent as follows:16.179, 16.196, and 17.350, respectively. These results were not predicted and unexpected.

A separate univariate analysis of variance was run to test the effects of self-esteem and mortality salience on the gender-role behaviour sentences completion task. Scoring for this measure was for the inconsistent sentences only. If subjects explained away the inconsistent gender-role behaviour it was score as one, if the subject did not explain away the inconsistent gender-role behaviour it was scored a zero. This score method resulted in a possible score range of zero to 6. Two independent raters rated the sentence completion task and any discrepancies between raters on an item resulted in a score of zero for that item. Concordance rates between raters 91%. The results of the ANOVA were not significant by treatment, p=.740, which was contrary to predictions.

A comparative t-test revealed a significant increase in anxiety regardless of condition, t=5.819, p=.000. Means for pre/post anxiety overall were 32.17 and 36.53. An analysis of variance on the difference scores for pre/post state anxiety by condition revealed a significant main effect, F(1,62)=5.267, p=.025. The death condition subjects had significantly higher anxiety score increases after the manipulation and dependent

measures. For the death condition pre/post means were 31.23 and 36.89 and for the dental condition pre/post anxiety scores were 33.28 and 36.09.

Comparative t-test were conducted on the death-thought accessibility score differences for subjects regardless of condition (n=70), t=6.994, p=.000. The first death-thought accessibility test mean was .656, the second test mean was 1.625. Analysis of variance on the death thought accessibility difference scores revealed no significant difference by treatment, p=.475. Differences approached significance for gender, p=.054, mean for male subjects for the first and second test were .550 and 1.650, and for female subjects means were .720 and 1.4000, respectively. Males tended to have a larger increase in death related words. Subjects in the death group did not have less death-thought related words compared to the dental condition.

Discussion

Results of this study support the hypotheses that thinking about death increases preference for the consistent depictions of stereotypes and is consistent with other TMT research (e.g., Schimel, 1999). MS increased the response latency time for inconsistent stereotypes in the Stroop task. When subjects in the death condition encountered a inconsistent descriptor word of the primed stereotyped target they had longer response in identifying the colour print of that word. Subjects in the dental condition did not show this increased response latency. Subjects in the death condition experienced cognitive interference for only the inconsistent stereotypes, suggesting that the inconsistent stereotypes were incongruent with their expectations resulting in increased response latency times. This evidence supports the hypotheses that reminders of death increase the

preference for consistent stereotype depictions of out-groups, lending support to terror management theory and hypotheses posited by Shimel et al., (1999) that MS increases stereotypical thinking. This study failed to replicate the findings of Schimel et al. using the gender-role behaviour sentence completion task. A possible explanation for this is that the sentences used in this study were not the sentences used in the Schimel et al. study. Items, such as "Steve feed the baby" and "Anna shoveled the driveway" were used as inconsistent gender-role behaviour in this, and no subjects this the present study tried to explain these example away to suggested preference for gender-role consistent behaviour. It is possible that the items chosen for the measure in this study did not depict gender-role inconsistent behaviour.

Terror management theory has show that self-esteem decreases worldview defense and MS effects. This study found that self-esteem did not effect stereotype preference or decrease stereotype activation. A possible explanation for why this prediction was not supported is that subjects were not acting in a defensive manner towards the stimulus (e.g., stereotypes) or in a way to bolster their self-esteem through the process of downward social comparison. Although there were effects of self-esteem, they were not predicted. One possible explanation of why high self-esteem subjects had longer response latency times compared to low self-esteem subjects is computer experience. People who use the Internet and computers a lot, may have lower social skills, see themselves low in social competence, they may tend to be private and possibly isolated and may have lower self-esteem in comparison to individuals who do not use computer and the Internet a lot (Kraut et al., 1998). Therefore, low self-esteem may be associated with highly developed computer skills including greater ability in moving the computer mouse, which was used

to register a response in the Stroop task. High self-esteem males may have less Internet

and computer experience then the low- esteem males. Men with high-esteem may spend

more time in social groups and less time in front of a computer possibly explaining why

males with low self-esteem had faster reaction times. Although this effects was not noted

between high and low self-esteem females, it could possibly mean that female subjects had

more computer experience then the male subjects or the result of a small male sample size

(n=20). Another possible explanation for the observed results is that self-esteem is not

related to stereotype activation or preference. Future research that examines the

relationship between self-esteem and stereotype activation may help to explain these

results.

Anxiety increased significantly for both groups, but the death condition group had

significantly higher increases. Thinking about ones death may produce significantly more

anxiety than thinking about going to the dentist, but an interaction between the MS and

the explicit nature of the stereotypes in the Stroop task cannot be ruled out. Anxiety

caused by the awareness of death seems to be specific to the effects of MS, and anxiety

produced by thinking about going to the dentist does not effect stereotype preference. No

support was found for the active suppression of death-related words in this study. Both

the dental and death condition subjects had similar scores on the death-thought scale. This

could be due to an oversight in the present experimental design. The death thought

accessibility task was not properly counter-balances, nor was it the identical measures

used by Arndt et al., (1997), who have used a similar measure successfully in research on

suppression of death thoughts. The time between the two tasks (approximately 20

minutes) could also be possibly the reason why no differences were found between groups.

The main hypothesis of this paper is that reminders of death will increase the preference for consistent depictions of out-groups. The results clearly show that thinking about death caused more cognitive interference for inconsistent stereotypes in the Stroop task and increased response latency times. The results support the hypothesis that MS increases the preference for stereotype consistency. These results may be explained in two ways. First, subjects may have been expecting consistent depictions of stereotyped groups because mortality salience increased access to stereotypes. Therefore, inconsistent stereotypes were incongruent with expectations causing interference resulting in longer response latency times. Second, subjects in the death condition may have had an increased need for the cultural worldview as a way to buffer anxiety caused by the death manipulation. If stereotypes can be seen as part of the cultural worldview, subjects who encountered the consistent representation of the worldview, (e.g., the consistent stereotype) showed an increased preference for the consistent representation of the worldview resulting in increased response time to the stimuli. Conversely, subjects after reminders of death, showed decreased preference for inconsistent worldview stimuli resulting in slower responses to the inconsistent stimuli.

The results of this experiment are consistent with Schimel et al, (1999) and TMT in general but more specifically, the results are consistent with TMT's view of stereotypes and prejudice as helping to defend against the deeply rooted fear of human mortality. Results support Shimel et al., hypothesis that MS increases stereotypic thinking.

References

Allport, G. (1954). The Nature of Prejudice. Cambridge, MA: Addison-Wesley.

Arndt, J., Greenberg, J., Solomon, S., Pyszczynski, T., & Simon, L. (1997). Suppression,

accessibility of death-related thoughts, and cultural worldview defense: Exploring the

psychodynamics of terror management. Journal of Personality and Social Psychology, 73,

1, 5-18.

Bandura, A. (1977). Social Learning Theory. Englewood Cliffs, NJ: Prentice-Hill.

Becker, E. (1973). The Denial of Death. New York: Free Press.

Devine, G. (1989). Stereotypes and prejudice: Their automatic and controlled

components. Journal of Personality and Social Psychology, 56, 5-18.

Dovidio, J., Brigham, J., Johnson, B., & Gaertner, S. (1996). Stereotyping, prejudice, and

discrimination: Another look. In N. Macrae, C. Stangor, & M. Hewstone (Eds.),

Stereotypes and Stereotyping (pp. 1276-1319). New York: Guilford.

Goldenberg, J., McCoy, S., Pyszczynski, T., Greenberg, J., & Solomon, S. (2000). The

body as a Source of self-esteem: The effects of mortality salience on identification with

one's body, interest in sex, and a appearance monitoring. Journal of Personality and Social

Psychology, 79, 1, 118-130.

Greenberg, J., Pyszczynski, T., Solomon, S. (1986). The cause and consequence of the

need for self-esteem: A terror management theory. In R.F. Baumeister (Ed.), Public Self

and Private Self (pp. 189-212). New York: Springer-Verlag.

Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., &

Lyon, D. (1990). Evidence for terror management II; The effects of mortality salience on

reactions to those who threaten of bolster the cultural worldview. Journal of Personality

and Social Psychology, 58, 2, 308-318.

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., &

Simon, L. (1992). Why do people need self-esteem? Converging evidence that self-esteem

serves an anxiety-buffering function. Journal of Personality and Social Psychology, 63,

913-992.

Greenberg, J., Pyszczynski, T., Solomon, S., Pinel, E., Simon, L., & Jordan, K. (1993).

Effects of self-esteem on vulnerability-denying defensive distortions: Further evidence of

an anxiety-buffering function of self-esteem. Journal of Experimental Social Psychology,

29, 229-251.

Greenberg, J., Pyszczynski, T., Solomon, S., Simon, L., & Breus, M. (1994). Role of

consciousness and accessibility of death-related thoughts in mortality salience effect.

Journal of Personality and Social Psychology, 67, 4, 627-637.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-

esteem and cultural worldviews: Empirical assessments and conceptual refinements.

Advancements in Experimental Social Psychology, 29, 61-136.

Gotlib, I., & McCann, C. (1983). Construct accessibility and depression. Journal of

Personality and Social Psychology, 72, 428-439.

Harmon-Jones, E., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., & McGregor,

H. (1997). Terror management theory and self-esteem: evidence that increased self-esteem

reduces mortality salience effects. Journal of Personality and Social Psychology, 72, 1, 24-

36.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of

mortality salience on inter-group discrimination between minimal groups. European

Journal of Social Psychology, 26, 677-681.

Hastie, R. (1984). Causes and effects of causal attribution. Journal of Personality and

Social Psychology, 46, 44-56.

Jussim, L., Coleman, L., & Lerch, L. (1987). The nature of stereotypes: A comparison

and integration of three theories. The Journal of Personality and Social Psychology, 52, 3,

536-546.

Kawakami, K., Dion, K., & Dovidio, J. (1998) Racial prejudice and stereotype

activation. Personality and Social Psychology Bulletin, 24, 407-416.

Kawakami, K., Dovidio, J., Moll, J., Hermsen, S., & Russin, A. (2000). Just say no (to

stereotypes): Effects of training in the negation of stereotypic associations on stereotypes

activation. Journal of Personality and Social Psychology, 76, 5, 871-888.

MacLeod, C. (1991). Half a century of research on the Stroop effect: An integrative

review. Psychological Bulletin, 109, 2, 163-203.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopardhyay, & Scherlis, W.

(1998). Internet paradox: A social techology that reduces social involvement and

psychological well-being? American Psychologist, 53, 9, 1017-1031.

McGregor, H., Lieberman, J., Greenberg, J., Solomon, S., Arndt, J., Simon L., &

Pyszczynski, T. (1998). Terror management and Aggression: Evidence that mortality

salience motivates aggression against worldview-threatening others. Journal of Personality

and Social Psychology, 74, 3, 590-605.

Nugent, W, & Thomas, J. (1993). Validation of the Self-Esteem Rating Scale. Research on Social Work Practice, 3, 191-207

Rosenblatt, A., Greenberg, J., Solomon, S., Pyszczynski, T., & Lyon, D. (1989). Evidence for terror management theory 1: The effects of mortality salience on reactions to those who violate or uphold cultural values. Journal of Personality and Social Psychology, 57, 681-690.

Tajfel, H. & Turner, J. (1979). An integrative theory of the inter-group conflict. In W.G. Austin & S. Worchel (Eds.), The Social Psychology of Intergroup Relations (pp. 33-47). Monterey, Ca: Brooks & Cole.

Peterson, J. (1998). Sauces: Classical and Contemporary Sauce Making. New York: John Wiley & Sons.

Schimel, J., Simon, L., Greenberg, J., Pyszczynski, T., Solomon, S., Waxmonsky, J., & Arndt, J. (1999). Stereotypes and terror management: Evidence that mortality salience enhances stereotypic thinking and preferences. Journal of Personality and Social Psychology, 77, 5, 905-926.

Sherif, M., Harvey, D., White, B., Hood, W., & Sherif, C. (1961). The Robbers' Cave Experiment. Norman, OK: Institute of Group Relations.

Spielberger, D. (1977). State Trait Anxiety Inventory: (STAI). California: Consulting Psychologist Press.

Stroop, J. (1935). Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 18, 643-622.

von Hippel, W., Sekaquaptewa, D., & Vargas, P. (1997) The linguistic intergroup bias as an implicit indicator of prejudice. Journal of Experimental Social Psychology, 33, 490-509.

Appendix A

Neutral Word list: kitchen appliance, transportation department, buttered popcorn, birthday cake, weather station, carnival ride, keyboard player, electric motor, geological survey, apartment building, deciduous tree, porcelain bathtub, light house, hockey stick, window pane, tree house, cardboard box, walkie talkie, anniversary party

Consistent Word list: lazy welfare mother, warring arabs, fighting irish, crooked lawyers, dumb newfy, dumb blondes, lazy hispanics, butch lesbians, lazy mexicans, grumpy old man, dirty pakistani, radical muslims, rebellious teen, cheap jew, drunken native, cheap italians, thieving blackman, flaming homosexual, lying politicians

Inconsistent Word list: masculine homosexual, honest black, sober native, working welfare mother, feminine lesbian, friendly old man, industrious hispanic, smart blonde, truthful politicians, calm irish, honest lawyer, giving italian, responsible teen, peaceful muslim, generous jew, clean pakistani, passive arab, hardworking mexican, smart newfy

Appendix B

Figure 1.1:   Graph illustrating group means (response latency) for each of the three word

Lists (dependent measures) from the Stroop task.