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ASSESSING THE AFFECTIVE SIMON PARADIGM AS A MEASURE OF INDIVIDUAL DIFFERENCES IN IMPLICIT SOCIAL COGNITION ABOUT DEATH

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ABSTRACT

The authors describe the use of the affective Simon paradigm as a measure of individual differences in implicit social cognition about death. Participants made verbal responses of "good" or "bad" to death and neutral stimuli based on whether the word was a person or a thing. Participants also completed the Revised Death Attitude Profile, a Stroop task, and a version of the Implicit Association Test using death-related words. Although the affective Simon paradigm has some theoretical advantages over the IAT and Stroop procedures, we found no evidence for its validity in the present study.

[234]
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[235]

INTRODUCTION

Implicit social cognition is the persisting pattern of mental associations, influenced by past experience, that can impact future behaviors even in the absence of any awareness of the mental associations, the past experience that shaped them, or how they might be influencing behavior (Greenwald & Banaji, 1995). A growing number of methodological tools, based on reaction time, can be used to measure implicit social cognition. Examples of these measures include affective priming (Bargh, Chaiken, Raymond, & Hymes, 1996), the emotional Stroop (Williams, Matthews, & MacLeod, 1996), and the Implicit Associations Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Because these reaction time approaches are assumed to be less susceptible to social desirability bias, they appeal to researchers interested in studying sensitive issues such as racism or sexism where there is reason to doubt the veracity of participants' self-reported

attitudes. In the present paper the authors examine the possibility of adding the affective Simon paradigm (De Houwer & Eelen, 1998) to the list of techniques for measuring individual differences in implicit social cognition.

We begin with an overview of the IAT and emotional Stroop task and some observations about their limitations. Next, we discuss some theoretical advantages of the affective Simon paradigm in overcoming these limitations. Finally, we present the results of a study in which we assessed the validity of the affective Simon paradigm as a measure of implicit social cognition about death. Death was selected as the implicit social cognition to be assessed because there is theoretical reason to doubt participants' self-reports on this topic. For example, many theorists have argued that people deny their fear of death by keeping thoughts of death outside of conscious awareness either through suppression or distraction (Becker, 1973; Firestone, 1993; Solomon, Greenberg, & Pyszczynski, 1991, Florian & Mikulincer, 2004). In contrast to this theorizing, empirical evidence indicates that people generally report low levels of death anxiety (Kastenbaum, 2000) and view a hypothetical world with no death negatively (Kastenbaum, 1996). Perhaps self-report measures underestimate the extent of death concern. If this is the case, then investigators interested in measuring death attitudes need to delve below the level of conscious report.

The IAT: Background and Limitations

The reader may ask why a new measure of implicit social cognition is needed when measures such as the IAT and Stroop already exist? These measures are certainly useful, but there are limitations to their use and interpretation (cf. Fazio & Olson, 2003). The flexibility of the affective Simon approach may be useful, therefore, in overcoming these limitations.

The IAT (Greenwald, McGhee, & Schwartz, 1998) was designed to measure implicit social cognition by examining the mental linkage between two target concepts or between a target concept and an evaluative concept. This linkage is measured by the relative speed with which people can respond to a pair of concepts. In the typical administration of the IAT, stimuli are presented one at a time on a computer screen. A response on the right side of the keyboard is required if the stimuli belong to either category A or category C. A response on the left side of the keyboard is required if the stimuli belong to either category B or category D. On another set of trials, the pairing is switched so that participants must make a right response for stimuli in category A or D and a left response for stimuli in category B or C. The mental linkage between concepts is defined as the difference in reaction time on the two sets of trials, with faster reaction times indicating a stronger association between concepts. For example, Greenwald et al. (1998) required participants in one set of trials to make a right key response for flower words and for good words and a left key response for insect words and bad. In another set of trials the participants were required to make a right key response for flower words and bad words and a left key response for insect words and good words. Overall participants responded significantly faster when pairing flower with good and insect with bad than when pairing flower with bad and insect with good. Presumably, this finding reflects the fact that most people like flowers and dislike insects.

In addition to measuring overall preferences, the IAT can also be used to measure individual differences in implicit social cognition. The magnitude of difference in reaction time on trials with different response criteria serves as an index of implicit social cognition about the target concepts. For example, an IAT measure of implicit racism is the difference in reaction times when pairing White with good and Black with bad and reaction times when pairing White with bad and Black with good. The IAT has been used to measure individual differences in sexism (Rudman & Killanski, 2000), racism (Dasgupta, McGhee, & Banaji, 2000; Greenwald, McGhee, & Schwartz, 1998), self-esteem (Greenwald & Farnham, 2000), romantic fantasies (Rudman & Heppen, 2003), spider phobia (de jong, van den Hout, & Rietbueck, 2003), and weight identity (Grover, Keel, & Mitchell, 2003). Although the utility of IAT is well established, it may be best suited to particular types of research questions. In their original presentation of the IAT, Greenwald et al. (1998) recognized that the IAT offers a good measure of implicit cognition for dichotomous concepts such as race (e.g., Black vs. White) but is less well suited for measuring attitudes about target concepts that are not dichotomous. Nosek and Banaji (2001) further highlighted this limitation. In addition, even for dichotomous concepts, interpreting IAT results is often difficult. As Markman, Brendl, and Messiner (2001) indicated, it is difficult to determine if an IAT score reflects a positive attitude towards the target concept or a negative attitude towards the comparison concept. For example, in an IAT assessing implicit racism, if a person responds faster when pairing "White" with "Good" and "Black" with "Bad" than when pairing "White" with "Bad" and "Black" with "Good," then does this person have a pro-White attitude or an anti-Black attitude?

The Emotional Stroop Task: Background and Limitations

The original Stroop (1935) task required participants to name the color of stimuli, either an array of Xs (i.e., XXXXX) or a color name (e.g. blue). The color names appeared in either a congruent or incongruent color. For example, the word red could appear in red (congruent) or in blue (incongruent). Color-naming responses were slower for incongruent color-word stimuli than for congruent color word or non-word stimuli. Numerous studies have replicated this effect (cf. MacLeod, 1991). Although there are many competing explanations for this Stroop effect, most focus on automaticity and response competition. Because reading is a well-learned automatic behavior people are unable to disregard the semantic content of word stimuli even when that content is not relevant to the task demand of color naming. This inability to inhibit semantic processing drains cognitive resources away form the task demand of color naming. Further, the semantic content produces a response (the name of the word) that is incompatible with the response required by the task (the color in which the word appears). Therefore, reaction time is slowed because these two responses compete for access to a sole output channel.

The emotional variant of the Stroop compares reaction times for naming the color of emotion-laden words and neutral words. A large body of research indicates greater Stroop interference when naming the color of words relating to participants' unique anxiety concerns (cf. Williams, MacLeod, & Mathews, 1996). For example, the emotional Stroop has been used to measure aversion to a wide variety of targets such as social anxiety (Mathews & MacLeod, 1985), test anxiety (MacLeod & Rutherford, 1992), rape (Foa, Feske, Murdock, Kozak, & McCarthy, 1991), and arachnophobia (Watts, McKenna, Sharrock, & Trezise, 1986). Williams et al. offered two possible candidate mechanisms to account for this emotional Stroop interference. The first is

attention bias because phobic individuals are likely to be hyper-vigilant for cues related to their particular phobia and the consequent greater accessibility of these thoughts makes it more difficult for them to inhibit the task-irrelevant semantic content of phobic stimuli. The second is suppression because phobic individuals automatically process the emotional content of stimuli pertaining to their particular phobia. Consequently, they may initiate thought-suppression efforts that will create cognitive load and deplete the resources needed for rapid task performance.

[236]
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[237]

Most studies have used the emotional Stoop task to distinguish between clinical and non-clinical populations, but it may be less sensitive to detecting individual differences within the normal range. An additional limitation of the Stroop color-naming task is that it offers researchers little control over how participants process the stimuli. Participants can extract the relevant color information without fully reading the word and thereby override the ability of the irrelevant affective feature of the stimulus to produce interference. Participants engaging in these conscious override strategies will show faster overall response times regardless of the type of word. For example, Mathews and Sebastian (1993) found that, compared to control participants, snake-phobic participants did not show greater Stroop interference for snake words. However, snake-phobic participants did show faster overall reaction times. Further, the emotional version of the Stroop is not completely analogous to the original Stroop. In the emotional Stroop task the affective meaning of the stimuli can divert attention away from the processing of the task-relevant feature of the stimuli, but this does not lead to a response that is incompatible with the required response.

The Affective Simon Paradigm

De Houwer and Eelen (1998) described an affective Simon paradigm, which offers a promising new approach to examining implicit social cognition by requiring participants to make verbal responses that are either affectively congruent or incongruent with the valence of the stimuli. The advantage of this new approach is that it allows researchers to better influence the way in which participants process stimuli while being less concerned with controlling the non-affective stimulus dimensions. In the original spatial Simon paradigm (Simon, 1990), participants were required to make either a left or right response to stimuli appearing in different spatial locations based on some non-spatial feature such as color. Reaction times were slower when the spatial position of the stimuli was incompatible with the response (e.g., a stimulus presented on the right requires a left response or a stimulus presented on the left requires a right response).

In the affective variant of the Simon paradigm, participants are required to give an affect-laden verbal response based on some non-affective stimulus dimension. For example, in the first report of the affective Simon paradigm, De Houwer and Eelen (1998) varied the valence of words but had participants make verbal responses of "positive" and "negative" based on whether test stimuli were nouns or adjectives. Participants responded more quickly when stimulus valence and response valence were compatible (saying "positive" to positive words and "negative" to negative words) than when stimulus valence and response valence were incompatible (saying "negative" to positive words and "positive" to negative words). De Houwer, Crombez, Baeyens, and Hermans (2001) conceptually replicated this finding using semantic category, grammatical

category, and even letter case as the non-affective dimensions for evaluating word stimuli. These authors also demonstrated an affective Simon effect using black and white versus color and man-made versus natural as the non-affective dimensions for evaluating picture stimuli. Tipples (2001) found an affective Simon effect using "nice" or "nasty" and "comedy" or "cancer" as the affective responses.

The theoretical account offered by De Houwer and Eelen (1998) as to why the affective Simon effect occurs is based on automaticity. They pointed out that the essential features of the affective Simon paradigm are: (1) that the task demand makes the affective feature of the stimulus irrelevant and (2) that the task requires a response that is either compatible or incompatible with the affective feature of the stimulus. The fact that participants are slower to respond when the affective meaning of the stimulus is incompatible with the required response suggests that the affective feature of the stimulus is being processed automatically. Because it is incompatible with the required response, this automatically processed affective information interferes with participants' ability to respond based on the non-affective feature of the stimulus.

[237]
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[238]

A potential application of the affective Simon paradigm is to measure an individual's implicit social cognition about specific concepts. Whereas the IAT and the emotional Stroop task have been used to measure individual differences, the authors know of no reported studies using the affective Simon paradigm to measure individual differences in implicit social cognition about a specific concept. It seems reasonable, however, that the Simon effect (to the extent that the negative stimuli all represent the same concept) could serve as an index of implicit social cognition about a single concept. The affective Simon paradigm has an advantage over the IAT because it does not require a dichotomous target concept. Similarly, the affective Simon paradigm has an advantage over the emotional Stroop task because it offers the experimenter more control over how the stimuli are processed. By choosing a semantic but non-affective response task (e.g., is the word a noun or an adjective), the researcher ensures that the participant cannot make the required response by processing only surface features of the stimulus and thereby increases the likelihood that the irrelevant affective feature of the stimulus will be processed and interfere with task performance. An additional advantage of the affective Simon paradigm is that the affective features of the stimuli produce responses that are incompatible with the required response based on the non-affective task-relevant dimension. In this way, the affective Simon paradigm may be more similar than the emotional variant of the Stroop task to the original Stroop task.

The Case of Death

The goal of the present investigation was to demonstrate that the affective Simon paradigm could be used to assess individual differences in implicit social cognition about a specific target concept. Specifically, the affective Simon paradigm was used as a reaction-time measure of implicit attitudes about death, with more negative implicit attitudes about death indicated by slower reaction times when pairing death-related stimuli with a "good" response than when pairing death-related stimuli with a "bad" response. Death anxiety was chosen as the target

concept because of concerns that it cannot be adequately assessed using self-report (Becker, 1973; Firestone, 1993; Solomon, Greenberg, & Pyszczynski, 1991; Florian & Mikulincer, 2004).

Studies using the emotional Stroop procedure as a measure of death anxiety have revealed that in general people take longer to name the color of death words than non-death words (Feifel & Branscombe, 1973). However, there is little evidence for the validity of the emotional Stroop task as a measure of death anxiety. The extent of Stroop interference for death words was greater among terminally ill patients than healthy individuals (Feifel, Freilich, & Herman, 1973). In contrast, no relation emerged between Stroop measures of death anxiety and self-report measures of death depression (Saboonchi & Lundh, 1997), death anxiety, or religiosity (Lundh & Radon, 1998). Similarly, Bassett and Dabbs (2003) found only modest evidence for the validity of the IAT as a measure of death attitudes. In one study, these authors had mortuary and university students complete a paper and pencil version of the IAT assessing the extent to which they associated death with self versus others. Although both groups responded faster when pairing death with others than when pairing death with self, this difference was greater among university than mortuary students. In a second study, these authors reported that implicit acceptance of death as measured by the IAT was not correlated with self-reported death anxiety but was predictive of wanting a living will and interest in prearranging one's own funeral. However, the interpretation of these IAT findings is difficult because life was juxtaposed to death as the comparison category. Consequently, it is difficult to determine if effects were driven by attitudes toward death or attitudes toward life.

The affective Simon paradigm might be a better measure of implicit social cognition about death because it offers greater control than the Stroop paradigm over how participants process stimuli and because, unlike the IAT, it does not require a comparison target concept. We modified the affective Simon paradigm in the present study to use affectively negative stimuli exemplars from a single concept (death). Consequently, the difference in reaction time when making an affectively positive or affectively negative response to death stimuli should provide an index of implicit social cognition about death. In order to examine convergent validity, implicit death attitude scores based on the affective Simon paradigm were compared to self-reported death attitudes, as well as to implicit death attitudes based on other reaction time measures - the emotional Stroop task and the IAT.

[238]
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[239]

METHOD

Participants

Participants were 89 undergraduate students enrolled in introductory psychology classes at a large urban university. Of these participants, 60 were women, 24 were men, and 5 did not report their gender. Participants ranged in age from 18 to 49 years, with a mean age of 22.2 years (SD = 6.4). Participants received partial credit towards the completion of a class research requirement.

Materials and Procedure

Participants completed the revised Death Attitude Profile (DAP-R, Wong, Recker, & Gesser, 1994) on which they reported their agreement with several statements about death. Next, participants completed a version of the IAT assessing implicit death acceptance that measured response speed when pairing words about death or life with words about self or other people. In addition, participants performed an emotional Stroop task in which their speed for identifying the color of death words (by pressing an appropriate key on a computer keyboard) was compared to their speed for identifying the color of emotionally neutral words. Lastly, participants completed an affective Simon task in which they had to give positive or negative verbal responses to death and non-death words based on whether the word was a person or a thing.

Affective Simon

Participants performed an affective Simon task in which they were asked to make verbal responses of "good" or "bad" based on whether a stimulus word was a person or a thing. One half of the participants were instructed to say "good" if the word was a person and "bad" if the word was a thing, whereas the other half of participants were instructed to say "good" if the word was a thing and "bad" if the word was a person. The first set of trials served as practice to allow participants a chance to become accustomed to pairing the appropriate response with the appropriate stimuli. In this practice trial half of the words were people (yankee, leader, chief, student, mayor, son) and half the words were things (farm, town, avenue, football, machinery, cars). Each word was presented in the center of the computer screen in 96-point Times New Roman font. Participants responded by speaking into a microphone that they held in their hand. An "X" was presented in the center of the screen prior to the appearance of each stimulus to orient the participant. There was a 500 ms interval between participants' response and the appearance of the orienting "X." There was also a 500 ms interval between the appearance of the orienting "X" and the next stimulus word.

In the test trials, half the words were people and half the words were things. One half of the people words were death-related (undertaker, mortician, coroner, killer, murderer, executioner) and the other half of the people words were positive (parent, fireman, lover, friend, spouse, hero). One half of the thing words were death related (cemetery, morgue, grave, coffin, casket, urn) and the other half of the thing words were positive (sunset, silk, gold, roses, candy, chocolate). In a pilot study participants rated the valence of stimulus words on a 9-point scale, where 1 indicated "extremely negative" and 9 indicated "extremely positive." Positive thing words ($M = 7.72$) were rated as more positive than were death thing words ($M = 3.08$), $F(1, 22) = 262$, $p < .01$ and positive people words ($M = 8.00$) were rated as more positive than were death people words ($M = 2.69$), $F(1, 22) = 393$, $p < .01$. Each word was presented only once and the order of presentation was randomized. An experimenter recorded whether each response was correct or incorrect and any instances in which the participant's response failed to trigger the voice key. We excluded from analysis all incorrect responses, responses faster than 200 ms and responses slower than 1400 ms.

Stroop

Participants completed a Stroop task in which they identified the color of word stimuli by making a left or right keyboard response. We instructed one half of the participants to press the "Q" key if the word was blue and the "P" key if the word was yellow and the other half of the participants to pres the "P" key if the word was blue and the "Q" key if the word was yellow. In 40 initial practice trials, stimuli were figures made up of five X's (i.e., XXXXX). These practice trials allowed participants time to become proficient at which response was required for which color. In the test trials stimuli were five words related to death (i.e., morgue, skull, corpse, death, coffin) and five control words that were matched with the death words for number of letters and frequency of occurrence (i.e., flocks, herbs, errand, field, castle). Each word was presented twice (once in yellow and once in blue) for a total of 20 trials. Words were presented one at a time in 96-point Times New Roman font on a 35 cm computer screen. There was a 200 ms interval between each participant's response and the onset of the next stimulus. The order of presentation was randomized with the restriction that no color or word type appeared more than three times consecutively. We excluded from analysis all incorrect responses, responses faster than 200 ms and responses slower than 1400 ms. We calculated a Stroop measure of implicit death concern by subtracting the average speed with which participants identified the color of control words from the average speed with which participants identified the color of death words, with higher resulting scores indicating more death anxiety. We viewed this score as indicative of implicit death concern because the semantic processing of death words more than the semantic processing of non-death words captures participants' attention and detracts from their ability to perform the color identification task.

IAT

Using a version of the IAT described by Dabbs, Bassett, and Dyomina (2003) that runs on a personal digital assistant (PDA), we assessed participants' implicit death acceptance. The PDA is a relatively inexpensive hand-held computer. In the PDA administration of the IAT, participants categorize words as belonging to one of four categories by using a stylus to tap the left or right side of the PDA screen. Each test begins with 12 words shown on the screen, four category labels (in upper case letters) and three exemplars for each category (in lower case letters). After examining the category labels and exemplars to be used for a given trial, participants tap a button on the PDA screen labeled "begin test," following which the category labels remain visible at the top of the screen while exemplars appear one at a time in the center of the screen. Each trial consists of 24 exemplar words presented in one of 20 preprogrammed random orders with the qualification that exemplars representing the same category cannot occur more than three times consecutively. Words remain visible on the screen until the participant makes a response by using a stylus to tap the left or right side of the screen. There is a 400 ms interval between a participant's response and the onset of the next stimulus word. The PDA records the correctness of the response and the reaction time in milliseconds.

Following a procedure described by Bassett and Dabbs (2003), the category labels and exemplars used to measure implicit death acceptance were "DEATH" (death, die, dying), "LIFE" (life, live, living), "SELF" (me, my, mine), and "OTHERS" (they, them, theirs). On one trial, participants paired "LIFE" and "SELF" with a left response and "DEATH" and "OTHERS" with a right response. On another trial, the pairing was switched so that "LIFE" and "OTHERS" required a left response and "DEATH" and "SELF" required a right response. The order of pairings was

counterbalanced so that one half of participants did the "DEATH" with "OTHERS" trial first and the other half of participants did the "DEATH" with "SELF" trial first. We excluded from analysis all incorrect responses, responses faster than 200 ms and responses slower than 1400 ms. An IAT measure of death acceptance was created by subtracting the mean reaction time for categorizing words when pairing "Death" with "Self" from the mean reaction time for categorizing words when pairing "Death" with "Other," so that higher scores indicated more implicit association of death with self than with others.

[240]
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[241]

DAP-R

Participants also completed the revised Death Attitude Profile (DAP-R; Wong, Recker, & Gesser, 1994), on which they expressed their agreement, using a 7-point Likert scale (strongly disagree to strongly agree), with 32 death-related items. The DAP-R yields separate indexes of the extent to which people fear death, avoid death, and accept death. Death acceptance may be characterized as: 1) neutral acceptance, involving stoic recognition of the inevitability of death, 2) approach acceptance, involving the conceptualization of death as a positive event such as the passageway to a better existence, or 3) escape acceptance, involving viewing death as a release from the hardships of life. The fear of death score is the average rating of 7-items such as "Death is no doubt a grim experience." Wong et al. reported an internal consistency coefficient of .86 and a test-retest reliability of .71 for this scale. The death avoidance score is the average rating of 5-items such as "I avoid death thoughts at all costs." Wong et al. reported an internal consistency coefficient of .88 and a test-retest reliability of .61 for this scale. The neutral acceptance score is the average rating of 5-items such as "Death is a natural aspect of life." Wong et al. reported an internal consistency coefficient of .65 and a test-retest reliability of .64 for this scale. The approach acceptance score is the average rating of 10-items such as "I believe that I will be in heaven after I die." Wong et al. reported an internal consistency coefficient of .97 and a test-retest reliability of .95 for this scale. The escape acceptance score is the average rating of 5-items such as "Death will bring an end to all my troubles." Wong et al. reported an internal consistency coefficient of .84 and a test-retest reliability of .83 for this scale.

RESULTS

The affective Simon effect was observed, with participants responding significantly faster when stimulus words and responses were affectively congruent ($M = 808$, $SD = 129$) than when stimulus words and responses were affectively incongruent ($M = 857$, $SD = 148$), $F(1,92) = 35.45$, $p < .01$. A Simon measure of implicit death concern was created by subtracting the mean reaction time for trials when participants were required to give a verbal response of bad to death-related words from the mean reaction time for trials when participants were required to give a verbal response of good to death-related words. The means and standard deviations for implicit and self-report measures are presented in Table 1. Correlations among implicit and self-report measures are presented in Table 2. None of the implicit measures were correlated with any of the self-report measures. The Simon measure of implicit death concern was not correlated with self-reported death attitudes or with the Stroop measure. However, implicit death concern as measured by the affective Simon was significantly positively correlated with implicit death

acceptance as measured by the IAT. Participants who implicitly associated death with self more than other people also tended to have more difficulty giving positive responses to death stimuli.

Table 1. Means, Standard Deviations, and Reliabilities for Implicit and Explicit Measures

	Mean	Standard Deviation	Chronbach's Alpha
Fear of Death	3.78	1.23	.78
Death Avoidance	3.75	1.49	.89
Neutral Acceptance	5.78	0.76	.55
Approach Acceptance	4.88	1.47	.93
Escape Acceptance	3.76	1.59	.88
IAT	-1.71	10.11	
Stroop	5.42	69.09	
Affective Simon	48.76	78.98	

[241]

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[242]

Table 2. Correlations Among Implicit and Explicit Measures of Death Attitudes

	1	2	3	4	5	6	7	8
1. Simon		.01	-.13	.14	.08	.15	.15	.29*
2. Fear of Death			.57*	-16	-.12	-28*	.00	-.12
3. Death Avoidance				.03	-.01	-.13	-15	-.16
4. Neutral Acceptance					.29*	.23*	-05	.02
5. Approach Acceptance						.45*	.17	-.12
6. Escape Acceptance							.12	-.07

7. Stroop -10.

8. IAT

* p < .05

DISCUSSION

Consistent with previous research findings (De Houwer, Crombez, Baeyens, Hermans, 2001; De Houwer & Eelen, 1998; and Tripples, 2001), participants' reaction times were faster when the stimulus and response were affectively congruent than when the stimulus and response were affectively incongruent. Unlike previous research, the present study used negative stimuli that were all related to the same concept (i.e., death). Therefore, the Simon effect should be indicative of individual's implicit attitudes towards death. However, this affective Simon measure was not related to self-reported death attitudes. Similarly, the other reaction time measures of death attitudes (IAT and Stroop) were also unrelated to self-report measures. Many other researchers have failed to find a relation between implicit and explicit measures of death in particular (Handal, Peal, Napoli, & Austrin, 1984; Lundh & Radon, 1998; Saboonchi & Lundh, 1997) and other concepts in general (Karpinski & Hilton, 2001). This lack of relation may reflect the fact that implicit measures are less sensitive to distorted or biased reporting. Consequently, participants who are anxious about death could have reported little death anxiety (biased self-report) but would have shown more implicit death anxiety on the implicit measure. Alternatively, as Wilson, Lindsey, and Schooler (2000) suggested, it may be possible that people can simultaneously hold different implicit and explicit attitudes about the same concept. Therefore, implicit and explicit death attitudes may be congruent for some participants but incongruent for other participants, making it difficult to detect an overall pattern of relation.

The possibility of simultaneously having different implicit and explicit attitudes about the same target does not, however, account for the finding that the affective Simon measure was not related to the Stroop measure because both of these tasks assess implicit attitudes. However, as Nosek and Banaji (2001) pointed out, it may be erroneous to assume that different measures tap the same implicit cognition because the demands of the tasks are somewhat similar. Further, the Stroop and Simon tasks differ in the extent to which the response is related to the affective content of the stimuli. De Houwer and Eelen (1998, p. 46) noted "the essential feature of the Simon paradigm is that the irrelevant feature is meaningfully related to the response that has to be made." Although the negative affective features of the death stimuli are incompatible with the verbal response of good in the affective Simon task described in this study, they are not incompatible with the color response required in the Stroop task. It is also possible that the lack of relation between the Stroop and affective Simon measures of implicit death anxiety stem from several differences in the way the tasks were administered. The Stroop task required manual responses, whereas the affective Simon task required verbal responses. Further, fewer exemplar stimuli were used in the Stroop task than in the affective Simon task. The lack of relation between the two measures in the present study could be due either to the differing requirements

inherent in the tasks or to the differing number of stimuli and response modalities implemented. However, the affective Simon measure was statistically significantly (but weakly) related to the IAT measure even though the tasks were administered differently.

Although there are several existing measures of implicit social cognition, researchers should continue to work on the development of new measures because, as Nosek and Banaji (2001, p. 34) pointed out, "no one measure will, or can, serve the demands of all research questions." The affective Simon paradigm seemed to be a good candidate for measuring individual differences in implicit social cognition because of several features that overcome theoretical limitations of measures such as the emotional Stroop and IAT. It makes possible the assessment of attitudes about non-dichotomous targets and it offers researchers great flexibility as to how participants process stimuli. In addition, the affective Simon paradigm is sensitive to the ability of stimulus valence to interfere with task demands because, unlike the Stroop task, it requires participants to make a response that is affectively related (either congruent or incongruent) with the stimuli. However, none of these advantages is useful unless it can be established that the affective Simon paradigm is measuring something meaningful.

The affective Simon task faces a shared problem with other measures of implicit social cognition like the Stroop and IAT in that convergent validity may be difficult to establish using self-report measures. If reaction time measures of implicit social cognition are conceptualized as measuring emotional reactions to targets that participants are either inattentive to and unaware of or motivated to deny, then there is no reason to expect such scores to correlate with self-report measures. Although there may be good reason to doubt the veracity of self-reported attitudes about topics such as death, implicit measures based on reaction time cannot be assumed superior to self-report measures unless they can be validated. Future research demonstrating the validity of the affective Simon paradigm is needed before its use can be advocated. Future attempts at validating the affective Simon paradigm should focus on comparing it to physiological or behavioral measure rather than self-report. In the case of death attitudes, such studies could examine the ability of the affective Simon index of death attitude to predict physiological changes in response to death stimuli (e.g., blood levels of the stress hormone cortisol, greater brow contraction measured by electromyography, increased pulse rate, or electrodermal activity), distinguish between groups (e.g. morticians vs. university students), or moderate behaviors in response to mortality salience manipulations (cf. Pyszczynski, Greenberg, & Solomon, 1997).

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