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This study, by use of a 2 x 2 mixed factor design, analyzed confidence in recall about an object's position (whether a door was locked) among college students. The Maudsley Obsessive-Compulsive Inventory (MOCI), particularly the Checking Subscale, was used to assign participants to either a group who self-reported more checking symptoms similar to those seen in obsessive-compulsive disorder or a group of those who reported less checking symptoms. The criteria yielded a group of 20 checkers and a group of 20 noncheckers, matched for age and gender. Each participant, regardless of group assignment, went through the same procedure. The procedure consisted of taking a confidence pretest, facing an anxiety stimulus, and taking a confidence post-test. It was predicted that given a relevant anxiety stimulus (a crime article and crime ad), those more preoccupied with checking (checkers) would have a change in their confidence level towards memory about a particular action intended to deter crime (i.e., locking one's door). However, there were no significant differences between checkers and those who reported less checking symptoms. Follow-up independent samples t tests helped confirm this result. An additional analysis of the confidence scores of women and men before and after exposure to the anxiety stimulus detected no significant gender differences and independent samples t tests detected likewise. Despite an inability to produce significant

differences, this study offers a research paradigm for revision, for replication with a larger sample of participants, and/or for a clinical sample.

THE EFFECTS OF AN ANXIETY STIMULUS ON CONFIDENCE RATINGS AMONG NONCLINICAL CHECKERS

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I learned many things from this process. The most important being that many, many people write a thesis. I would like to thank each one of them. I would like to thank my mother, Sheryl Haltom, for her prayers, but most importantly God, for listening. I owe my work ethic to my father, Tom Haltom, who owes his to his father John Haltom. John, with much sorrow, passed away earlier this year from complications due to Alzheimer's disease. This thesis is dedicated to him.

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CHAPTER 1

INTRODUCTION

Obsessive-compulsive disorder (OCD) is among the family of anxiety disorders. The symptoms of the disorder take the form of recurring, persistent thoughts (obsessions) and/or repetitive behaviors (compulsions) (American Psychiatric Association [APA], 1994). The obsessions will be distressing and unrealistic; however, the individuals experiencing the obsessions are aware that the thoughts are their own and not inserted from an outside source (APA, 1994). The individual will attempt to avoid the thoughts or neutralize them with another thought (APA, 1994). In other cases, the individual may feel compelled to engage in mental acts or excessively repetitive behaviors in response to the obsessions in order to reduce the initial distress (APA, 1994). The latter reaction, excessively repetitive behaviors, can take the form of cleaning, checking, counting, hoarding, organizing, and touching compulsions. Excessive checking behavior in a nonclinical population, somewhat comparable to that seen with OCD, is the subject of the present study. In OCD, excessive checking is typically manifested in repeated acts of checking door locks, envelopes/letters, items on a test, stove knobs, etc., to make certain the objects are in a comfortable position, or state. More specifically, this study intends to examine how a single treatment condition may differently affect those who report more checking as opposed to those who report less.

Obsessive-compulsive disorder has received increased attention in the media and motion picture industry in the past decade. As symptoms become more publicized, there will likely be a growth in public awareness and interest. Scientific research needs to

increase to meet the possible growth in the demand for knowledge. It has been suggested that checking behavior, among the symptoms of the disorder, is prevalent, yet understudied, and is part of the "'psychopathology of everyday life'" (Sher, Frost, & Otto, 1983, p. 362). Karno and Golding (1991) reported a measurement of the lifetime prevalence of OCD in the general population being 50 times earlier estimations made from psychiatric patients–approximately 2.6% of the population (1 in every 40 people). Karno and Golding also suggested that the nature of the disorder is sometimes such that sufferers may not always seek treatment and there is a tendency to forget or minimize symptoms that began years earlier.

As for answers about the causes of excessive checking behavior comparable to that seen with OCD, there are a number of explanations. Anxiety is known to be one of the contributors. Sher, Mann, and Frost (1984) stated that there is an assumption that anxiety has effects on both the frequency and intensity of compulsive behaviors. Much research has examined this relationship in individuals with checking concerns; however, the stimuli used in these studies are not often relevant to the fears of these individuals. Logically so, various problems with memory and how they contribute to excessive checking behavior have been explored, but findings are inconsistent (Rachman & Shafran, 1998). In the past decade, problems with confidence and these influences on checking have just begun to be studied. Rachman and Shafran imply that early results indicate a promising explanation which needs further empirical support. Although there are likely to be contributors in addition to anxiety and confidence, these two variables were examined in the present study among a nonclinical sample.

Nonclinical subjects for a clinical topic. The present author assumed the recruitment of clinical subjects would be difficult. Even less conservative results report a lifetime prevalence of OCD being only 2.6% (Karno & Golding, 1991). Frost, LaHart, Dugas, and Sher (1988) stated that there are not many patients with OCD available to study. This is not to negate a need for the study of obsessive-compulsive symptoms.

A number of studies have observed and used nonclinical subjects to study OCD. Goodwin and Sher (1992) reported evidence of continuity between OCD and normal behaviors. Although Frost et al. (1988) indicated a sparseness of available OCD subjects, they also suggested that using analogue, or nonclinical, populations to study obsessive-compulsive symptoms is valid. Frost, Sher, and Geen (1986), encourage the use of nonclinical subjects to examine obsessive-compulsive symptoms like checking more closely. Further, the differences they found between controls and nonclinical checkers indicate an opportunity that is promising for the study of compulsive checking behavior (1986).

Checkers. The term checkers has been used in psychological research to describe those who self-report greater compulsive checking behavior. Several forms of criteria have been used throughout the research literature to designate a group as checkers. In the majority of studies concerned with compulsive checking behavior and examined by the present writer, the Maudsley Obsessive-Compulsive Inventory (MOCI, see Appendix E) was included in the criteria–specifically the MOCI Checking Subscale (Hodgson & Rachman, 1977). In many studies, the MOCI has been the only criterion used for designation of the checker category. However, there has been some variation in cutoff

scores of the MOCI Checking Subscale across the research. Some researchers (e.g., Sher, Martin, Raskin, & Perrigo, 1991) used a score of 4 or above on the MOCI Checking Subscale for assignment to a checking group whereas others used a cutoff score of 5 or above on the subscale. Sher et al. (1991) used a cutoff score of 4 or above in order to obtain a more sufficient sample size.

A study of a sample from a clinical population (consecutive admissions to a community mental health center) used a cutoff of 4 or above for assignment to the checking category (Sher, Frost, Kushner, Crews, & Alexander, 1989). This criterion identified 27% of the sample as checkers. Comparatively, the Sher et al. (1991) study with the same criterion of greater than or equal to 4, but with a sample of college students, identified 20% of their screening sample as checkers. In contrast, a cutoff of 5 or greater in another study of college students identified 12.8% of the sample as checkers (Sher et al., 1983). Finally, Roth and Baribeau (1996) found that having a cutoff score of greater than 5 but not equal to 5 identified just 6% of their screening sample of college students as checkers.

Psychopathology and checking. Sher et al. (1991) in a sample of college student checkers discovered significantly more indications of psychopathology than college student controls. The diagnostic criteria for Major Depressive Episode, Social Phobia, Drug Abuse/Dependence, and Obsessive-Compulsive Disorder was met at a significantly higher level among this sample of checkers compared to those without as many checking concerns. In fact, according to the Diagnostic Interview Schedule based on the DSM-III-R criteria (DIS/DSM-III-R), 11% of the checkers in this sample met the criteria for OCD.

The DIS/DSM-III-R is an interview schedule intended to be used in large surveys where individuals without clinical training could administer it (Leaf, Myers, & McEvoy, 1991). It requires no clinical judgement on the part of the administrator, only the reading of questions and the recording of responses (1991). The DIS/DSM-III-R assesses both the presence and severity of some lifetime diagnoses according to the diagnoses' definition in the DSM-III-R (Sher et al., 1991).

Frost et al. (1986) found that checkers obtained from a college student sample reported anxiety, aggressive impulses, confusion, depression, feelings of loss of control, social introversion and withdrawal at higher levels than noncheckers. Sher et al. (1989) looked at a sample consisting of consecutive admissions to a community mental health center. They defined checkers with similar criteria as Sher et al. (1991) and Frost et al. (1986) and found the clinical sample to report significantly more symptomatology. They concluded that, "Thus, as with college students, among psychiatric patients checking is associated with general distress and greater psychopathology" (Sher et al., 1989, p. 68).

Context of checking. Checking behavior may occur with other obsessive-compulsive symptoms. Rachman (1976) points out that checking compulsions are second only to cleaning compulsions. Obsessional ruminations are believed by clinicians to appear least frequently (1976). Contrary to this view, there are theories which suggest obsessions precede compulsions and contribute to their development. Salkovskis (1985) implied this in his cognitive-behavioral analysis of obsessive-compulsive symptoms, which will be discussed later.

Gender distinctions about checking behavior have also been made. Emmelkamp

(1982) found that men were more likely to display checking compulsions, while women were more likely to display washing compulsions. Danger themes occur frequently with obsessive-compulsive concerns (Salkovskis, 1985); this seems apparent whether an individual displays checking or cleaning compulsions. Danger themes refer to preoccupations with harm or threat. Most likely, the theme could be reflected by the object one is checking. Possibly, danger themes appear most evident when an individual is checking such things as door locks and gas valves. However, danger would probably not be a motive behind checking a refrigerator door.

Furthermore, there are other conditions under which checking rituals occur. Rachman (1976) indicated that checking most often takes place when the checker is at home, alone, or depressed, but less likely to occur in situations where the checker is not responsible for an outcome of some kind. For example, checkers will probably not be as concerned about securing the locks of a business next to their own as checkers will at their own place of employment.

Responsibility and checking. Rachman's (1976) observation about checking brings up the notion of responsibility and checking. A number of researchers have examined the role that responsibility plays in checking and obsessive-compulsive symptoms in general. Salkovskis (1985, p. 575) commented on "neutralization," another term for compulsive behavior and indicated that it is an attempt to decrease the chance of being "responsible" for harm to self or others. Decreasing the chances of being responsible could be taken a step further and individuals with the need might attempt to avoid situations altogether in which they could be held responsible. Rheaume, Ladouceur, Freeston, and Latarte (1995)

suggested that seeking reassurance from authority figures, often seen by obsessives, is an attempt to spread responsibility. They clarify that spreading responsibility is enacted by checkers making acquaintances aware of checkers worries and making arrangements so their acquaintances can carry out responsibilities for them. Sher et al. (1983) in designing a questionnaire for their study, expected that checkers would endorse certain feelings. Among them, they expected that they would be less willing to take on large responsibilities such as buying a house (1983). All these indications suggest that individuals with obsessive-compulsive symptoms will try to avoid responsibility.

A number of researchers have explored what happens when individuals are unable to avoid responsibility concerns. As implied previously from Salkovskis' (1985) article, checking or some other form of compulsive behavior will likely follow an encounter with responsibility. Ladouceur et al. (1995) by creating a high responsibility experimental task, found the group of nonclinical subjects showed significantly more checking behaviors and hesitations compared to nonclinical subjects who participated in the low responsibility task. Rheaume, Ladouceur, et al. (1995) also using high and low responsibility situations, found that the subjects' beliefs about pivotal influence created the greatest differences between the two situations. They defined pivotal influence as an individual's thoughts about the extent of control they have over a situation. They found that pivotal influence was the best predictor of responsibility; and further, they suggested their results may have important implications for OCD research and clinicians working with the disorder.

Relevance and checking. Research implies that both personal relevance and content may be as important as responsibility to the contribution of compulsive checking

(Ladouceur et al.,1995). In exploring the effects of exposure to feared, imagined disasters on obsessive-compulsive checkers, Foa, Steketee, Turner, and Fischer (1980) commented how many studies have explored the effectiveness of different types of exposure. However, they added that equally important is the exposure's content and relevance to an individual's symptoms. Rheaume, Ladouceur et al. (1995) retained only situations that were relevant to the subjects' concerns because they assumed that only these situations would be salient enough to stimulate a responsibility schema; their results supported this assumption. Sher et al. (1984) suggested that their experimental tasks may not have been relevant enough to elicit feelings of being personally responsible among their group of nonclinical checkers, thereby indicating the importance of relevance in experimental designs using subjects with compulsive checking behaviors.

These findings raise the question about what exactly is meaningful content to an individual with compulsive behavior. Salkovskis (1985) suggested that causing harm or failing to avoid harm where that might have been possible are among the beliefs of obsessive-compulsives. Ladouceur et al. (1995) suggested that perception of danger or threat might be required prior to perception of responsibility in order to create compulsive behavior. In their conclusion, Ladouceur et al. felt that perception of danger was a necessary variable in creating the behavior. Considering this, harm, danger, or threat may be meaningful and relevant themes for individuals with obsessive-compulsive-like concerns, especially those centered around checking. Checking locks or gas taps are related to harm prevention; in addition, Item 6 of the MOCI addresses this concern directly (Hodgson & Rachman, 1977).

Salkovskis (1998, p. 37) stated that, "Although they [OCD sufferers] will check the door of their house many times, the same patients seldom have problems locking a broom cupboard door." The implication is that it is less likely that harm could come from leaving a cupboard door rather than one's front door open. On the contrary, if harmful chemicals were housed in the cupboard and the person with obsessive-compulsive concerns was caring for a small child, the cupboard door might be very relevant to them. Although harm is a theme in OCD, harm themes could still be specific to individual circumstances.

Cognitive behavioral theories and checking. Anxiety appears to be a contributor in compulsive checking behavior. Further, anxiety often develops after exposure to tangible, environmental cues and is paired with beliefs or cognitions about possible harm after exposure to the tangible cues (Foa et al., 1980). As neutralizations, such as checking, are behavioral attempts to control the anxiety, a cognitive theory seems applicable. Several authors have published on the cognitive elements of OCD. From their study, Freeston et al. (1994) concluded that worry and obsessions, among OCD phenomena, are distinguished through loss of control about cognitive events, especially those considered to be anxiety invoking. Rheaume, Ladouceur, et al. (1995) suggested that responsibility and danger exaggeration were separate cognitive schemas, but both are related to OCD; and as earlier indicated, both responsibility and danger contribute to compulsive behavior (Ladouceur et al., 1995), possibly compulsive checking being among that behavior.

Salkovskis (1985) provided an in-depth analysis on the cognitive phenomena involved in OCD (see also Figure 1). Disturbing intrusions, considered to be part of OCD

phenomena, often occur with normal individuals. However, automatic thoughts about the intrusions, particularly if they are negative, differentiate individuals with obsessive-compulsive behaviors. Negative, automatic thoughts about the intrusions are what disturbs both mood and the ability to cope in individuals with obsessive-compulsive concerns; furthermore, mood enhances the occurrence of similar, mood-related thoughts. Salkovskis (1995) stresses that intrusions will be disturbing only when they are salient to the individual, thereby tying this theory into the role that relevance contributes to obsessive-compulsive behavior.

Other portions of Salkovskis' (1985) study are important to the current study. It is mentioned that there are some beliefs which may be commonly retained by individuals with obsessive-compulsive concerns. Of particular relevance to the present study is the belief that thinking about an action is equal to the action's occurrence. This can be interpreted two ways. First, Salkovskis' meaning seems related to a concept termed reality monitoring. McNally and Kohlbeck (1993) described reality monitoring deficits, as they pertain to OCD, as an uncertainty between action and imagination. This description applied to checking, for example, might be uncertainty whether one locked a door or imagined locking it. Second, Salkovskis' categorization of the belief could also be viewed as a confusion between thought and occurrence. Once again, applied to checking, this could mean that hearing about a possible danger means it will more likely be thought to happen to a person concerned with the danger (if it is relevant to the person). This is somewhat related to another assumption made by obsessive-compulsives and suggested by

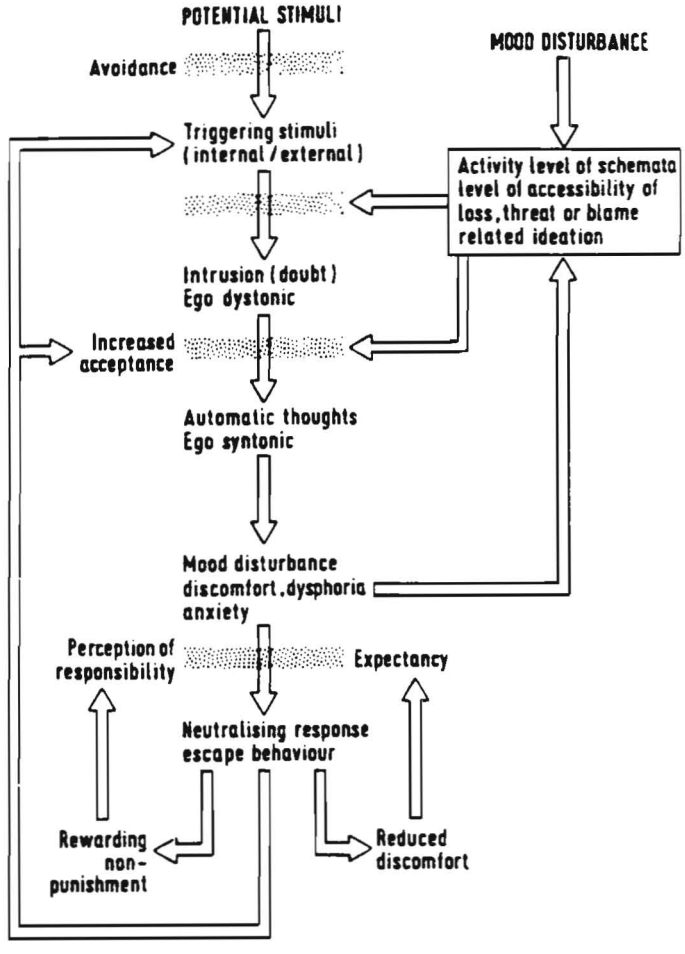

Figure 1. The Salkovskis model, "Mechanisms and modulating influences in obsessional thoughts and behaviour."

Salkovskis (1985) that resisting the urge to neutralize an intrusive thought is the same as wishing harm upon oneself. This seems to tie to responsibility, such that having a thought that is relevant to a fear of an obsessive-compulsive individual makes it hard for this person to ignore. Possibly just having a relevant thought is enough to instill responsibility in individuals with obsessive-compulsive concerns and thereby activate the entire thought process behind checking. In contrast, it might be less likely that normals or controls would hold the same belief patterns that would perpetuate checking.

Anxiety theories and checking. As proposed previously, the symptoms of OCD are contrived to defend against anxiety (Karno & Golding, 1991). Again, this assumption is based in psychoanalytic theory (Karno & Golding) and rooted in the writings of Sigmund Freud (Summerfeldt, Huta, & Swinson, 1998). Psychoanalytic theory is the most recognized account of OCD and the obsessional personality characteristics thereof (Summerfeldt et al.). However, despite its popularity, there are some conflicting views.

Roper, Rachman, and Hodgson (1973) indicated that completing the appropriate checking act will usually decrease anxiety or discomfort. This same study found that checkers, upon one or more occasions of checking, were significantly more likely than individuals with washing concerns (also a symptom of OCD) to experience increased anxiety after checking. This study also found that an increase in anxiety following testing was never observed among the group with washing concerns.

Roper et al's (1973) results could be seen as an indication that anxiety may not play the same role as suggested by psychoanalytic theory (where checking is concerned). Considering that anxiety was reduced in Roper and his colleagues' group with washing

concerns, possibly the psychoanalytic view explains cleaning compulsions much better than checking compulsions.

Therefore, if a theory was needed to better clarify checking compulsions, a theory appearing a decade before the psychoanalytic one may be useful. Summerfeldt et al. (1998) observed how Pierre Janet proposed that anxiety is a secondary factor in OCD; it is simply a response to the symptoms. In light of the present study's focus on checking symptoms, Janet's notion, applied to these symptoms alone, would suggest that checking may cause anxiety rather than reduce it. In a related analysis, Salkovskis (1985) commented on the avoidance behavior seen with obsessive-compulsives, such that the act of avoiding a scenario can actually trigger the thoughts and feelings one is attempting to divert. This analysis, applied to the present study, could mean that checking an object of concern, such as a particular door, could actually raise anxiety and thereby accomplish the opposite of the original intention. Essentially, avoidance could be compared to checking as both are behaviors intended to reduce encounters with anxiety. It could be further inferred from Salkovskis' analysis that seeing the door has the possibility to raise all the thoughts which have been perpetuating the actions, such as checking, directed towards the door. Further, exposure to images or words related to the object of concern could have the same effect.

A separate theory for checking seems reasonable when it is considered that a distinct motive behind checking has been proposed. It has been suggested that in most cases, the motivation behind checking is prevention; whereas, cleaning is most often motivated by the need for restoration (Rachman, 1976; Tallis & DeSilva, 1992). Rachman

suggested that cleaners are trying to avoid contact with danger, while checkers are taking precautions to avoid criticism or guilt. However, Tallis and DeSilva suggested that washing is rooted in the concern that contamination has taken place; but the act of checking is concerned with a threatening, future event which has yet to take place.

Anxiety stimuli and checking. Many studies have compared the effects anxiety has on compulsive checking behavior. Sher et al. (1984) stated, "It is assumed that anxiety affects the frequency and intensity of compulsive behavior" (p. 495). However, some studies have confronted difficulties with creating a suitable anxiety-provoking treatment, or paradigm, within their experimental design.

Sher et al. (1984) confessed that their experimental procedures with MOCI-designated checkers from a college student sample was not exceptionally anxiety provoking. Their procedure consisted of a protocol of inventories, questionnaires, and tests. It was found that anxiety apparently affects self-reported checking and self-reported cognitive dysfunction. Consistent with this result, Frost et al. (1988) found that both high and low compulsives took more time to sort cards with words related to fears printed on them as compared to non-fear cards. Further, Frost et al. (1986) found that checkers, as compared to non-checkers, reported more phobias. Although Sher et al. concluded that their procedure was not a good test of anxiety and how checkers will behave when confronted with more anxiety provoking tasks, the Frost et al. 1988 study seems to be of greater relevance by suggesting that there is a group of individuals, checkers, who self-report being more phobic in the presence of stimuli than those who do not report as much checking behavior.

Another study attempted to use stimuli that may be among the concerns of individuals with obsessive-compulsive behaviors; further, this study involved the subjects actually handling some of the objects of concern. Constans, Foa, Franklin, and Mathews (1995) investigated reality-monitoring ability, action-memory ability, and memory satisfaction in OC patients and non-psychiatric controls. Their abilities were measured not with neutral stimulus words, but 20 different objects; 14 were chosen because they were thought, by the researchers, to stimulate anxiety (for example, putting a knife in a sheath).

The evidence from this investigation was unable to support a reality monitoring deficit in OC checkers, either for anxiety evoking or neutral stimuli (Constans et al., 1995). There were no differences in either group's abilities to distinguish whether they acted on an object, or imagined acting on it. However, checkers were more accurate than controls when recalling in what position they left a fear-evoking object. The authors presumed that the OC checkers in this experiment might have used ". . . volitional strategies to increase detail elaboration because personal responsibility was attached to high-anxiety events" (1995, p. 671). Such action sequences as sheathing or unsheathing a knife exemplifies this. The possible concern behind leaving a knife improperly put away would be that someone might be cut and it would be the checkers' fault. This is consistent with many researchers' ideas about checkers and their obligations to responsibility. However, because this was in an experimental environment, it is also possible that the subjects felt the responsibility was divided. This is consistent with the observation made by Rheaume, Ladouceur et al. (1995). Constans, Foa, Franklin, and Mathews may have

created a situation that was not disturbing enough to fully interfere with the obsessive-compulsive subjects' decision-making processes.

Other stimuli not necessarily among the concerns of compulsive checkers have been found to possibly arouse discomfort, thereby altering the behavior or performance of individuals with obsessive-compulsive symptoms. Gordon (1985) found that increasing the speed of an experimental, automatic task caused obsessionals' accuracy to decrease. Further, in light of the results, the experimenter suggested that speed would better be labeled as a "stressor" (1985, p. 105). The intended stressor in this experiment, a high level of white noise, caused obsessionals to slow their response time. Noise, however, did not affect their accuracy on the latter task. The author suggested slowing their reaction time is a strategy to ensure accurate responses. Overall, the author found little indication of pathology, but some changes due to stress.

Frost and Sher (1989) looked at MOCI designated checking behavior along with exam-taking behavior among abnormal psychology students. They found that higher scores on the MOCI Checking Subscale were correlated with a greater frequency of answer checking. Further, there was a highly significant correlation between the subscale and amount of time taken to complete the exam. Checking, however, did not account for the additional time spent.

In general, Roper et al. (1973) found that it was difficult to invoke discomfort in subjects with checking compulsions as compared to subjects with washing compulsions–even when carrying out potentially harmful actions. Some of their subjects offered an explanation, and from that they concluded that as long as an experimenter was

present, the responsibility was taken off the subjects. In a sense, subjects believed the experimenter would not allow the potentially harmful acts (i.e., leaving gas taps on) to go uncorrected. This lends more support to the notion that obsessive-compulsive individuals may try to spread responsibility to others rather than encounter it themselves; furthermore, this may be another piece of evidence that checking behavior occurs under specific conditions. Roper et al. found additional conditions under which checking behavior occurred in their sample of obsessive-compulsive patients. They found that eliciting the desire to check was associated with increased anxiety. On the other hand, an immediate check is associated with a significant decrease in anxiety. Further, after a half hour of withholding allowance to check, there was also a significant decrease in anxiety/discomfort. The authors suggested this is due to there being a limited chance for improvement after this point.

Memory and checking. Memory-deficit hypotheses seemed to stand out in the literature. These hypotheses proposed that a deficient memory was the cause of compulsive checking. Some of these hypotheses were followed by supportive results, whereas others were not. Differences in experimental methods make it difficult to pool results and come to any one conclusion. According to Rachman and Shafran, "the results regarding memory deficits are inconsistent, and the conclusions are dependent upon the paradigm used to test the hypothesis" (1998, p. 68). They suggested the reason that the memory-deficit hypothesis has attracted attention is because it has face validity. A faulty memory seems like a reasonable explanation if an individual is checking specific objects

around one's home constantly because this person is not certain of the position the objects were left in.

Salkovskis stated, "The evidence for memory deficits in clinical OCD is slender" (1998, p. 38). He criticized the work of Sher et al. (1989) which correlated MOCI checking scores with Wechsler Memory Scale scores. Salkovskis (1998) clarifies that if an individual is in fact suffering from memory problems, they will check more. The MOCI Checking Subscale will likely reflect this. For this reason, caution should be taken against the use of the MOCI Checking Subscale alone in making statements which generalize to OCD. A high Checking Subscale score would probably mean more in relation to OCD if the overall score on the MOCI was also above the mean. Although research involving memory does not offer stable results, Rachman et al. point out a hypothesis which is "gaining empirical support" (1998, p. 68). This hypothesis suggests that a lack of confidence in recall can compromise satisfaction with memory and this doubting may cause compulsive checking.

Confidence and checking. MacDonald, Antony, MacLeod, and Richter (1997) explored how subjects with obsessive-compulsive disorder characterized by excessive checking symptoms, subjects having OCD without excessive checking symptoms, and non-clinical controls perform on episodic memory (declarative knowledge) tests of word recall and word recognition. OCD subjects' performance did not differ from control subjects on the test of recall. Nor did the subjects' performance differ from controls' on the test of recognition. However, examination of group differences on response latencies (time taken to respond–also a confidence measure) found marginal significance, while self-

report confidence ratings about recognition judgements showed that OCD checkers were significantly less confident about their judgements.

Even though word recall, or word recognition (MacDonald et al., 1997), is not likely to be among the concerns of obsessive-compulsive individuals, the cognitive process itself seems similar. Similarities are especially evident to the present author when examining the word recognition test. To clarify, with this test, subjects were required to identify words presented to them as 'old' (shown to them earlier in the experimental procedure) or 'new' (in the context of the experimental procedure, that moment being the first exposure). Similarly, obsessive-compulsives may struggle to recall an image such as a door being in the locked position and recognize whether they performed the task yesterday, or the day before ('old'), or whether they just performed the task ('new'). This observation is similar to those made in reality monitoring research, which is discussed in the next section. Despite this observation, it is still difficult to validate which neutral words would raise anxiety for individuals with OCD.

McNally and Kohlbeck (1993) explored reality monitoring ability in OCD patients, OCD noncheckers, and normal control subjects. Qualifications were based in part on the MOCI Checking subscale scores. In order to explore reality monitoring in this group of subjects, they looked at cards with words or images on them and were instructed to either trace, imagine, or look at the word or image. Later, they were questioned about what action they actually performed on the word or image. Similar to the previous study (MacDonald et al., 1997) subjects were also asked if the item was old or new. In addition, they were asked about their confidence in both their performance and identification

decision. OCD patients revealed no reality monitoring problems, but had less confidence in their memories.

Similarly, Constans et al. (1995) found that regardless of whether or not the object was emotionally arousing, obsessive-compulsive checkers for all objects indicated that they preferred their memories were more vivid before they could be satisfied with their recall about the position they left objects in. Although these are not ratings of confidence, the present author feels that desiring higher levels of memory vividness is relevant and very comparable to believing one's memory is not as vivid–thereby being less confident.

Perfectionism and checking. Rheaume, Freeston, Dugas, Letarte, and Ladouceur, (1995) suggested that a kind of pathological perfectionism contributed to obsessive-compulsive symptoms. Simplified, pathological perfectionism is the belief that a perfect state actually exists. Although some individuals suffering from obsessive-compulsive symptoms may agree with this definition, their behaviors could indicate otherwise. Essentially, repetitive checking could be looked at as attempts to ensure 100% security. Furthermore, although perfectionism and confidence have literal differences, where OCD is concerned, they could be compared categorically.

Rheaume, Freeston, et al. (1995) indicated that pathological perfectionism can apply to many areas including appearance, performance, morality and certainty. Perfectionism could also apply to confidence and the need to be perfectly so. Furthermore, perfecting other feelings might apply in OCD such as a need to be free of guilt. As was pointed out earlier, Rachman (1976) suggested that checkers are taking precautions to avoid criticism or guilt. In addition, Salkovskis (1985) states that neutralization behavior

can be interpreted as trying to avoid or reduce the chance of being the source of harm to self or others. However, Salkovskis also indicated that achieving a blameless state is nearly impossible.

Purpose of study

There were many intentions for the present study. One intention was to discover whether compulsive checking exists among college students at a rate comparable to populations from other studies with similar conditions; furthermore, to discover if anxiety, as well as confidence, contributes to the checking behavior. Another purpose of this study was to develop a research paradigm, or an experimental treatment, that will stimulate ideas about checking. Sher et al. (1984) believed that doing so is a possible goal and encourages others to pursue the problem. If successful, this experimental treatment could later be replicated and applied to actual clinical subjects. Finally, by examining an analysis by Salkovskis (1985) and comparing it with the present study's results, this study hoped to determine whether there is further evidence for the analysis; thereby adding a small facet to the ultimately multifaceted explanation of why checking occurs. As a result, added insight could be provided to assist in the cognitive-behavioral treatment of excessive checking behaviors and ultimately OCD. The cognitive-behavioral approach to treatment is believed by the present author to be particularly suited to OCD. Furthermore, Salkovskis argued that "obsessional thinking is the archetypal example of a cognitive disorder in the neuroses" (1985, p. 571).

Hypotheses

Based on the above considerations, an anxiety stimulus was developed and

introduced to both checking and nonchecking participants. Before and after exposure to the anxiety stimulus, a confidence measure was administered. The following hypotheses were tested:

Hypothesis 1: An effective anxiety stimulus would decrease confidence ratings from pretest to posttest for checkers.

Hypothesis 2: The same anxiety stimulus would not affect the confidence ratings from pretest to posttest for controls.

CHAPTER 2

METHOD

Participants

The participants were recruited through instructor advertisement at a Midwestern state university. The instructors introduced the study to their students by verbal announcement (see Appendix A1). The participants were from Introductory Psychology, Developmental Psychology, and Social Psychology courses. Those students who agreed to participate signed both their name and phone number to a sheet posted on a bulletin board in the psychology department. They did this so they could be contacted and an appointment could be arranged. Participants were called in the order they signed up; however, not every student who signed up participated. Some of those contacted chose not to participate, and others were unable to be reached before a sufficient sample was attained.

Participants were scheduled on 11 different occasions, but each participant went through the same experimental procedure–a completion of survey forms and an inventory to gather information and data about each participant (see Appendix A2). Although surveying sessions were at different times and dates, each participant was surveyed in the same location–a classroom in the university's library. Following each session, each participant's MOCI was scored to determine if an adequate size experimental group could be attained; after surveying 171 participants, an initial and sufficient sample was gathered.

There were several criteria applied to the initial sample of 171 participants to reduce it to a final sample of 40. All participants' surveys were scored by group, in order

of the date in which they were surveyed. To clarify, as indicated previously, groups of participants were surveyed at different times and on different dates. Although the actual order in which each participant turned in his or her survey could not be observed (the order was scrambled by having participants deposit their envelopes loosely into a slot box)–the order each group of participants finished the survey was observed. For example, participants' envelopes were randomly drawn from the box to be scored, but all those who participated in the November 18 session, were scored before those who participated in the November 19 session and so on. Survey scores were recorded in the random order in which they were drawn from the box. The box was cleared after each session and a running list of scores was compiled.

From this new list, the first to score four or above on the MOCI Checking subscale and eight or above for an overall score on the MOCI were chosen for the experimental group. This criterion was lowered one point from the Sher et al. (1983) study, but comparable to the Sher et al. (1991) study, in order to attain a sufficient sample size (see Table 1). The experimental group criteria comprised 10 women and 10 men with a mean age of 20.15 years (SD = 2.21). The control group was collected by returning to the beginning of the compiled list. The first 10 women and 10 men with an age not greater than or equal to 30 and scoring one or below on the MOCI Checking Subscale and seven or below for an overall score were chosen. The result was a group with a mean age of 19.15 (SD = 0.99).

Experimental Design

The previously described experimental procedure designated two groups: a

nonclinical checker group ($\geq$ 4 on the Checking Subscale of the MOCI and $\geq$ 8 on the overall score) and a control group ($\leq$ 1 on the MOCI Checking Subscale and $\leq$ 7 on the overall score). The study had a 2 (checkers and noncheckers) X 2 (test: pretest and posttest) mixed factor design. Checking status was a between subjects independent variable, and test (before and after anxiety) was the within subjects independent variable. The dependent variable was confidence. Again, the confidence score was only for Item 3 on the Confidence Rating Form (see Appendix C).

Instruments

MOCI. The Maudsley Obsessive-Compulsive Inventory (MOCI) is a 30-item, self-report measure of obsessive-compulsive-like symptoms (see Appendix E). For each item, respondents mark either true or false depending on their agreement with it. Some items are reversed, so a true response is not always an obsessive-compulsive one. For example, Item 1 says, "I avoid using public telephones because of possible contamination." In contrast, Item 5 says, "I don't worry unduly about contamination if I touch an animal." A true response to Item 1 and a false response to Item 5 would contribute 2 points to the Cleaning Subscale and also to the Overall Scale Score.

The MOCI is a brief and useful research tool when implemented to assess obsessional problems–specifically the type and severity of the problems (Hodgson & Rachman, 1977). As indicated previously, an overall score indicating total obsessionality and a factor score of cleaning can be derived; in addition, three other factor scores can be computed. These three factor scores are: checking, slowness, and doubting. Sher et al. (1983) in looking to validate the MOCI as a screening instrument for a college student

sample found that the MOCI does appear to distinguish individuals who will indicate more day-to-day checking behaviors than those who are compulsive, but do not check as frequently.

The MOCI Checking Subscale cutoff scores for the present study (≥ 4 for the experimental, checker group and ≤ 1 for the control group) were based on the Sher et al. (1991) study, but similar to the Sher et al. (1983) study. The cutoff score for the overall MOCI in the present study (≥ 8 for the checker group and ≤ 7 for the control group) is based on the Rubenstein, Peynircioglu, Chambless, and Pigott (1993) study, but is adjusted one point lower to match the initial adjustment to the checking subscale (see Table 1). Not all studies of this nature have implemented the use of both the subscale score and overall score as cutoffs. However, excessive checking behavior without other obsessive-compulsive symptoms, might be attributed to a problem other than OCD. Such a problem could be any condition that may impair memory, such as dementia; furthermore, any condition which may alter the perception of memory, like paranoia or mania, could be a condition that may affect memory and responses to the MOCI Checking Subscale.

Confidence measure. MacDonald et al. (1997) used a four-point confidence rating about recognition accuracy. The number "1" was selected for "not at all confident," "2--somewhat confident," "3--moderately confident," and "4–extremely confident." The present study's confidence measure was based on this rating system. Whereas, MacDonald et al. used the confidence ratings for recognition memory about words, the present study used the same ratings for confidence about object status (the position door locks were left in–locked or unlocked). In an earlier study, McNally and Kohlbeck (1993) used a

Table 1

Comparison of MOCI Cutoff Scores: Present Study's and Similar Study's

	MOCI-OSS	MOCI-CSS
Present Study		
Noncheckers	≤ 7	≤ 1
Checkers	≥ 8	≥ 4
Rubenstein et al. (1993) Study		
Noncheckers	≤ 8	≤ 2
Checkers	≥ 9	≥ 5
Sher et al. (1991) Study		
Noncheckers		≤ 1
Checkers		≥ 4

Note:
MOCI-OSS represents the Overall Scale Score of the MOCI, while MOCI-CSS represents the Checking Subscale Score.

three-point confidence rating system comparable to MacDonald et al. Similarly, McNally and Kohlbeck (1993) used the ratings to specifically pertain to their experimental tasks. The use of similar, numbered rating systems for participants to indicate their feelings, be it confidence or depression, is common practice in research.

Although eight items appear on the Confidence Rating Form (see Appendix C), this analysis was only interested in the score of Item 3 on the form. The other seven items were only related to the sham task which was evaluating the effectiveness of a crime ad for use in an ad campaign against crime. The true interest was how a relevant anxiety stimulus (a crime article and ad) would affect feelings of confidence about a relevant object's status (a door lock). Item 4 was initially intended to be added to Item 3 on the confidence measure to create one score; however, not all the participants endorsed it, so it was dropped from the final analysis of both pretest and post-test.

Procedure

Prior to agreement to participate, students were to be told by their class instructor that it was a study on conscientiousness about both crime and general accident and illness prevention. They were told that they could receive class credit for their participation. In addition, their participation would be entirely confidential and constitute filling out a survey and their time involved would be brief (see Appendix C). Further, it was emphasized that after completing the survey, there would be no further obligation and they would not even be required to sign their names to the surveys (see Appendix A1 for actual script).

As indicated previously, participants were studied in groups. Participants signed a

consent form further indicating agreement to participate (see Appendix A2 for actual script). Completing the previous process finalized a participant's belonging to the initial sample; after 40 students who met the group requirements agreed to be participants, recruitment was terminated. Prior to the survey's administration, the participants were reminded that the study was concerned with conscientiousness about both crime and general accident prevention.

Upon commencement of the administration session, participants were given a confidence measure (see Appendix C) that was borrowed from MacDonald et al.(1997), but was altered to fit the purpose of this study. The MacDonald et al. confidence rating was about recognition accuracy of neutral words. The present study used a similar rating system; however, participants rated confidence in thoughts about crime, safety, and preventative measures. Next, the demographic form, which did not include a blank requiring their name (see Appendix D) to be consistent with the study's advertisement, was administered. Following this, participants completed the MOCI (see Appendix E).

After facing the previous collection of forms together, the anxiety stimulus, or treatment, was experienced by both groups of participants simultaneously. It consisted of the participants being read an article (see Appendix F) about an escaped criminal and an ad on crime prevention (see Appendix G). The article was chosen for the present study because it was suspected to be anxiety-provoking for a number of reasons. First, the criminal was suspected to be in close relation to the town the participants lived in. Furthermore, as of the printing of the article, the criminal was still at-large and the article was worded to this effect. Last, among the violent acts the criminal was accused of was

the murder of a university student. The ad, created especially for this experiment, offered possibilities of crimes in the participants' community and preventative steps. It was visually presented and read to all participants (see Appendix G). Further, the ad was printed on yellow paper which was observed from public signs to be a color symbolizing caution. The ad was intended to stimulate ideas about checking and was designed with the Salkovskis (1985) model in mind (see Figure 2 & Figure 2A).

POTENTIAL STIMULI

Triggering stimuli
(internal / external)

Intrusion (doubt)
Ego dystonic

Automatic thoughts
Ego syntonic

Mood disturbance
discomfort, dysphoria
anxiety

Neutralising response
escape behaviour

Figure 2. The simplified Salkovskis (1985) model with:

Crime ad
(external)

Q: Did I lock my door?
Q: Did I put myself at risk?
Q: Etc.

A: Possibly I did not.
A: Possibly I did.
A: Etc.

& other thoughts like:

-residences have been broken into
-citizens have been assaulted
-etc.

Feelings of lower confidence

Checking

Figure 2A. The current experiment's design aspects incorporated.

Finally, the confidence measure was re-administered.

After the sample of 40 participants (20 in the experimental group and 20 in the control group) who met the defined criteria for each group was attained, all 171 participants were debriefed by letter in a fashion similar to the study's initial advertisement (see Appendix A3 for actual script and letter text).

CHAPTER 3

RESULTS

In order to analyze the data for this study, the Statistical Analysis Package for the Social Scientist (SPSS), Version 10 for Windows, was used. The specific analysis chosen was a 2 x 2 mixed factor analysis of variance. The first independent variable had two levels--nonchecker and checker. The second independent variable was test. The two levels for this variable were pretest (before anxiety) and posttest (after anxiety). The dependent variable was confidence score for Item 3 on the confidence measure.

SPSS was used to conduct an additional analysis. For this analysis, independent samples t tests ($p < .05$) were chosen. The independent variable was checking status (nonchecker or checker). The dependent variable was the gain score for Item 3 on the confidence measure (the posttest score subtract the pretest score).

There were no significant main effects or interactions (see Table 2). The means and standard deviations are presented in Table 3. Furthermore, the independent samples t tests found no significant differences between checkers' and noncheckers' gain scores from pretest to post-test. The means and standard deviations for the independent samples t tests are presented in Table 4.

Confidence and Gender

A follow-up analysis similar to the first two analyses was conducted; however, for this analysis, the independent variable, checking status, was replaced with gender in both the 2 x 2 mixed factorial and the independent samples t tests. In the initial sample of 153 participants, there were 52 men who were then compared on the confidence variable with

Table 2

Summary of Factorial Analysis of Variance of Checking Status (Checker or Nonchecker) and Anxiety (Before and After) as both Affects Confidence Scores

Source	df	SS	MS	F
Checking Status	1	.20	.20	2.11
Error	38	3.60	.09	
Anxiety	1	.20	.20	2.11
Checking Status X Anxiety	1	1.80	1.80	1.80
Error	38	38.00	1.00	

Table 3

Summary of Means and Standard Deviations of Confidence Scores by Checking Status (Checker or Nonchecker) and Anxiety

		Anxiety			
		Before		After	
	n	M	SD	M	SD
Checkers	20	3.4	.88	3.2	.83
Noncheckers	20	3.6	.60	3.6	.60
Total	40				

Table 4

Summary of Means and Standard Deviations of Gain Scores by Checking Status (Checker and Nonchecker)

	Gain Scores		
	n	M	SD
Checkers	20	-.20	.41
Noncheckers	20	.00	.46

the first 52 women who participated in the study. The pretest and posttest confidence scores were once again the dependent variable for the 2 x 2 mixed factor design. For the independent samples t tests, the gain scores from posttest to pretest for women and men on Item 3 of the confidence measure was the dependent variable.

However, there were no significant main effects or interactions (see Table 5). This was further confirmed with the independent samples t tests where no significant differences were found between women's and men's gain scores. Means and standard deviations are presented in Table 6.

Table 5

Summary of Factorial Analysis of Variance of Gender and Anxiety (Before and After) as both Affect Confidence Scores

Source	df	SS	MS	F
Gender	1	.69	.69	.47
Error Between	102	150.06	1.47	
Anxiety	1	.31	.31	3.25
Interaction	1	.02	.02	.20
Error Within	102	9.67	.09	

Table 6

Summary of Means and Standard Deviations of Gain Scores by Gender

	Gain Scores		
	n	M	SD
Men	52	-9.62	.41
Women	52	-5.77	.46

CHAPTER 4

DISCUSSION

The prediction made by Hypothesis 1 was that a stimulus suspected to be anxiety envoking would decrease confidence ratings from pretest to post-test for checkers. However, the results did not support this hypothesis. Checkers' pretest mean was not significantly different from their post-test mean.

The prediction made by Hypothesis 2 was that the same anxiety stimulus would not affect the confidence ratings from pretest to post-test for controls. The results did support this. Noncheckers' pretest mean was not significantly different from their post-test mean; however, being the results were the same for checkers, this finding means nothing in relation to the original hypothesis.

Together, these findings indicate that the anxiety stimulus did not affect confidence ratings about memory for object status. This finding is true of checkers and noncheckers alike as there were no significant difference between their confidence ratings before and after exposure to the anxiety stimulus. Considering only checkers, it may also be possible that anxiety is not really a factor in these individuals' self-reported, checking behavior. If anxiety is a factor though, there are a number of possibilities why the anxiety stimulus failed to lower participants' confidence ratings.

In general, there was most likely a small range for variance in scores to begin with. In other words, participants were not given much room to change their minds–possibly producing a ceiling or floor effect. This was likely due in part to the narrowness of the confidence measure; a scale of 1-11, for example, may have provided further room for

variance. Similar to this consideration, the margin for variance could have been further decreased by not including Item 4 of the confidence measure in the confidence score used in the final analysis.

Another possibility for no significant differences between tests was that although there was some time between the pretest and post-test, it was not considerable. There was approximately 20 minutes between the two tests. Possibly extending the time between pretest and post-test, or even administering them on separate dates, may increase the differences. In addition, the size of the sample being small may have also contributed to no differences being detected; whereas, a larger sample may find significant differences.

More specifically and considering this was a college student sample, it was possible for both checker and nonchecker that either could have roommates that they were not certain about their carefulness. If this was the case, confidence about whether their door was locked could be situational and independent of MOCI scores. Therefore, the decision of confidence could be related to a situation that was out of participants' control and have nothing to do with their own confidence in recall. Again, this possibility is fairly specific, but may have been a legitimate, extraneous variable that interfered with the production of significant differences.

All the above considerations are possible, providing the anxiety stimulus was effective in the first place. The results of the follow-up gender analysis could be interpreted as the anxiety stimulus being ineffective, though. Some additional hypotheses were made about the effects of the anxiety stimulus on women's and men's confidence scores. These hypotheses paralleled those made about checkers and noncheckers, but

substituted women and men instead. These hypotheses were made from scanning the data and suspecting that women's confidence scores in general were lower than men's. Furthermore, the analysis of gender differences in confidence scores was chosen after no significant differences were detected for checking status. From the larger, initial group of participants (n = 171), it was possible to match 52 women and 52 men, thereby well over doubling the number of participants used in the first analysis of checkers and noncheckers. Another motivation for the gender analysis was that it was suspected that women may feel more vulnerable to crime than men. It was hoped that this analysis may at least reveal whether the anxiety stimulus was effective where one group was concerned. Regardless, it was revealed that two groups thought to be susceptible to negative crime ideation, checkers and women, showed no significant change in the presence of the anxiety stimulus with a crime theme. Collectively, this suggests that the stimulus was not anxiety provoking enough. Nevertheless, it is possible that many of the considerations explaining why there were no differences between checkers and noncheckers apply to gender, also. These being range of the confidence measure, time between test and retest, and/or even having a careless roommate. Most likely there is no single explanation for no differences found between checkers and noncheckers–men or women.

Another plausible explanation has been suggested in past research. Constans et al. (1995), suggested that it is possible that checkers may have used volitional strategies to enhance their recognition in their study. Volitional strategies could be understood as the use of mnemonic devices. Checking rituals, theoretically, could fall under the mnemonic device category as they, like mnemonic devices, are behaviors intended to increase

certainty of memory. It is possible that among the checking participants in this study, many had made a specific point to be certain (possibly several times) that the door was in fact locked. This would thereby help to raise the checkers' mean confidence score. On the other hand, it is possible that among the nonchecking participants, there was a general lack of concern, or it was of little relevance to them whether their door was locked; therefore, noncheckers did not even take note. Instead, it is possible they went through their regular casual routine of leaving their residence. However, when asked, some noncheckers could not respond with certainty about the status of their door lock because they had not observed it as closely as a checker might had. It is possible that noncheckers' mean confidence scores could have been lowered to meet checkers'. To be sure, if some scores were raised (checkers) where they might otherwise have been low and some other scores were lowered (noncheckers) where they might have otherwise have been high, a situation might have been created where there was homogeneity between groups.

This consideration may help to explain why noncheckers scored similarly to checkers. The consideration, however, fails to explain why, for example, MacDonald et al. (1997) found that although checkers performed accurately on a recognition task, they were less confident in their performance. Furthermore, other results from the present also contradict the MacDonald et al. study and the McNally and Kohlbeck (1993) study also finding lower confidence in recall among checkers. Specifically, the present study found the checkers' pretest mean was not significantly different from noncheckers' pretest mean. This suggests that the checkers' confidence about recall of object status was not significantly different from noncheckers. This finding is independent of checkers being

exposed to any treatment condition at all–as this confidence rating was taken before exposure to the stimulus. Possibly this relates to how Roper et al. (1973) found a significant decrease in anxiety among obsessive-compulsive patients after 30 minutes of preventing them to check. In the present study, no data were collected about how much time had passed since participants had left their residence. It is possible that participants had been away from their residence beyond a point they felt they could do anything about it. This helplessness explanation is given by Roper et al. to explain their finding.

Another possibility for no variance between groups is the presentation of the study to participants. Participants were under the impression that they may be contributing input about the effectiveness of an ad campaign on crime. It is possible that participants did not separate their feelings of confidence from the evaluation of the ad. To clarify, instead of evaluating their own feelings at the moment, they used Item 3 of the confidence measure to express their feelings about the effectiveness of the ad. Possibly the results indicate that the ad was felt by participants to be mediocre. This explanation could explain why there were no differences between women and men, either.

The present study was correct in two assumptions made prior to conducting it. The first assumption made was that this study could be conducted with the available resources. The resources being number of available participants and amount of time allotted to conduct the study. It was assumed that 20 checkers (those scoring ≥ 5 on the MOCI-CSS) could be screened from undergraduate psychology courses at one university prior to the end of the semester. This was assumed from past research by Sher et al. (1983) which indicated that approximately156 students would need to be screened in

order to collect a group of checkers this size. From consulting graduate teaching assistants at the university where the study was conducted, assurance was given that due to course requirements and the need to fulfill credit, there would be at least this many students willing to participate. This number was met with 15 additional students. The semester drew to a close and participants needed to be debriefed through their instructor. Therefore, surveying was terminated and participants were debriefed; however, with the collected data from the MOCI scores, it was known that the cutoff score on the checking subscale would have to be lowered one point, like Sher et al. (1991) did with their study, in order to attain a sufficient sample of 20 checkers. The present study's criteria identified 13.1% of its sample as checkers. However, previous studies with similar criteria had somewhat higher percentages of checkers. It was suspected that at least two details may have contributed to this. The first being the inclusion of the criteria of participants needing to score ≥ 8 on the Overall Score of the MOCI. The next being the clarification of MOCI items due to the feeling that some terms or phrases may be outdated or obscure to participants. The explanations (See Appendix A2) may have helped indicate to the participants that some of the behaviors suggested in the inventory were related to abnormal thinking; thereby possibly raising defensiveness among participants.

Conclusions and Future Directions

In conclusion, the present study was unable to yield any significant findings–thereby losing support for the hypotheses made. Possibly, simply replicating the present experimental design with some moderate adjustments may yield different results.

Some possible suggestions for a future study would include first using a confidence measure with a larger rating scale.

Similarly, a replication should possibly include more confidence items. These items should concern objects that checkers are preoccupied with and consider them to be relevant. This would contribute to a larger, overall confidence score. For example, the present study began with two items in the confidence measure intended to be related to the concerns of most checkers--confidence about security of their residences' door locks and confidence about automobile locks. The latter item proved irrelevant to some checkers and noncheckers because they did not own an automobile. Considering the emphasis placed on relevance in the research literature, where checking is concerned, more care should be taken to know what is relevant to the sample intended to be used. This may mean screening the sample prior to creating items for a confidence measure.

A screening may gather information which could contribute to developing a more effective anxiety stimulus for checkers, also. Many of the studies which have used the MOCI to assign participants to a checking group, screened participants with the MOCI at a separate setting, then exposed them to a treatment at a later date. Possibly, the MOCI could be used to gather information about participants' checking interests prior to designing an anxiety stimulus for the participants'. This could increase the chances of the anxiety stimulus being tailored to each of the participants' concerns.

Although the above changes may make it difficult to recruit a large sample of checkers, due to the more stringent sample selection process, doing so may find greater differences between a checking group and a comparable-sized nonchecking group.

Recruiting a larger sample, even under stricter selection requirements, is a reasonable goal given the resources of time and large population of introductory psychology students. After all, checkers for this study were found in the present study's accessible population of undergraduate psychology students at a rate of 13.1%; and of this sample, 70% of them were concerned with the item targeted in designing the anxiety stimulus. A comparable frequency of checkers could probably be found in any college student sample with some variability depending on the number of requirements for assignment to the sample. The percentage will most likely decrease as criteria increase.

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APPENDIX A

1. Script for Instructor (I)

Instructions. Prior to reading the following announcement to classes, the instructor and experimenter will need to discuss whether a point reward for participation will be given. A statement about those points should be written in the appropriate blank. If this is not an option, the text relating to the rewarding of points should be crossed out. In addition, the location of a sign-up sheet will also need to be discussed by the instructor and experimenter. If the sign-up sheet is to be found in a central location, such as a bulletin board, they should choose *(1)* and write the location in the appropriate space. If the sign-up sheet is to be passed around by the instructor, they should choose *(2)*. The instructor should read the statement with the appropriate alterations. Furthermore, the statement should be read consistently to each class--if the instructor agrees to read it to more than one class.

Announcement

I. There is a study on concern about both crime and general accident prevention being conducted. Information from the study will contribute to the development of an ad campaign which will promote crime and accident prevention. It is an important study and relies on participant input. With this study, participants have an opportunity to do their part in making their community safer; (*the following is read only in psychology courses where the instructor has given approval*) in addition, they can receive class credit for their

time. *If approved*:

_____.

Instructor's statement about # of points

The study is completely confidential and involves taking a brief amount of time to fill out an anonymous survey; there will be no further obligation. If you are interested, please sign your name and phone number to the sign-up sheet: (1) located _____

Location

or (2) being passed around. You will be contacted by telephone in order to set up an appointment time.

Thank you, Hans Haltom, Experimenter

2. Script and Reminders for Experimenter (E)

a. Tell each participant, as they show up, to sign-in and leave room on the line as they will sign out, also.

b. Offer them a research participation slip and ask them to fill out the top part of the slip.

c. Offer them a pencil, if needed.

d. Before reading the script, wait 5 minutes past the scheduled start time–to give everyone a chance to show up. If a participant comes in beyond this, offer to reschedule them and explain that this is necessary because everyone goes through the survey steps at the same time.

Actual Script: Read Verbatim

E. This is a study looking at different areas of prevention. The portion of the study you will be participating in is mainly focused on crime prevention, but there will still be some questions about other areas of prevention, such as protection against accidents or

illness, to answer. Your answers will be entirely confidential and may possibly contribute to the development of an ad campaign against crime. These ads may appear in several area newspapers including the local paper. For this reason, your cooperation and honesty is important. However, keep in mind there are no right or wrong answers. Simply answer the questions based on how you feel at the moment you encounter the question. Some of the questions may repeat themselves. Therefore, your patience is greatly appreciated. Please begin by reading the informed consent document (see Appendix B); after which, should you decide you still wish to participate in the study, sign the document. If you have any questions at any time during the survey, please ask.

e. Make sure no one has participated in this study before.

f. Ask if there is anyone who did not sign the informed consent document. Thank those for coming if they choose not to participate.

g. Collect the documents.

h. Inform them that this is the only document which should have their name signed to it. Make it clear that no other document from this point should have their name on it.

i. Explain that each sheet from this point will be placed face down under their chair after they respond to it–one on top of another.

j. Inform them that they will be putting their stack in their own, self-sealing envelope and everyone will put their envelope into a slot box when the surveying procedure is over.

For those participants who sign the informed consent document . . .

E. This is the first part of the survey (see Appendix C). Read each question carefully and answer it according to your feeling at the moment you encounter the

question. For this part of the survey, you indicate your feelings of confidence by circling the number which best represents them. You can mark any number providing that is how you honestly feel at the very moment you read and consider the question.

k. Before going on, with each part of the survey, make sure everyone has a chance to look at and respond to their sheet.

Once the participants complete the confidence measure . . .

E. Now please complete this sheet gathering basic demographic information (see Appendix D). If you have any questions, please ask.

Once the participants complete the demographic sheet . . .

E. This is the next part of the survey (see Appendix E). Note the directions at the top of the page (see Appendix E) as I read them to you.

Once the directions are read . . .

E. Before you begin responding to the questions, let it be noted that the following 30 true/false questions will include the terms check, checking, etc. Checking, as it is used in this inventory, refers to the act of asking, looking, seeing, touching, etc. excessively ,or more than necessary, to determine if a person, place, or thing has been left in the desired state, condition, position, etc. Examples include: checking to see if a person is not mad at you, checking to see if a personal belonging was put away in the right spot, or checking to see if a door was locked. Again, doing these things excessively, or more than necessary, would mean check, or checking, as it is referred to in this part of the survey.

Some other terms or phrases require clarification:

#2. Uses . . . "nasty thoughts" - this would mean thoughts that you feel bad about having.

#4. Uses . . . "get through everything" - meaning preparing for an event, such as getting ready to go somewhere or even getting a homework assignment done, or ready on time.

#5. Uses . . . "unduly" - meaning without due, or a necessary reason, or even excessively--as in worry excessively.

#8. Uses . . . "unpleasant thoughts" - such as thoughts that make you uncomfortable for having them.

#9. Says . . . "worry unduly if I accidently bump into somebody" - which probably refers to worry about contamination or exposure to germs from touching a stranger.

#10. Says . . . "serious doubts about the simple everyday things I do" - meaning really wondering if you did a daily activity right or good enough. Such activities might include cleaning yourself, mailing a letter, or even talking to a classmate, or neighbor.

#25. Says . . . "I do not usually count when doing a routine task." This refers to the act of reciting to oneself, or even out loud, the number of times you perform a common action that would not normally require counting. Money or taking attendance, or role, requires counting. However, counting the number of times you scrub something while cleaning it does not typically require counting; counting of this nature is what this question is asking about.

#27. Uses . . . "antiseptics" - meaning fluids, powders, sprays, etc. intended to kill germs. If you need any further clarifications, please ask. Begin.

Once the participants complete the MOCI . . .

E. Now I am going to read to you an article from the Emporia Gazette (see Appendix F) about a criminal who has escaped from a town very near Emporia.

Experimenter reads article to participants.

E. In response to this crime, and many others in the area, an ad on crime prevention was created. Now I need you to look at the ad (see Appendix G) while I read it to you.

Experimenter hands laminated ad to each participant.

l. Inform them that you will be collecting them shortly for reuse and read an identical copy to them.

m. Wait five seconds before collecting the ads.

Following the reading of the ad . . .

E. This is a re-administration of some of the questions you responded to previously (Appendix C). This presentation excludes the basic demographic questions, and the true/false questions. Although this is still somewhat repetitious, I ask that you read each question carefully again and consider how you feel at the moment you reencounter the question. You do not have to respond to these questions with the same answers you gave the first time. This is not the intent of the re-administration; although, if you believe your feelings are the same, it is perfectly alright to answer the questions the same as you did before. However, it is fine to answer the questions differently. Of importance here, is that you answer each question based on how you feel at the very moment you reencounter the question. Again, there are no right or wrong answers. Once more, do you have any questions about this procedure? Further, if you have any questions during the survey–please ask.

n. After everyone has completed this, hand them an envelope and tell them to fold their

stack into the envelope and seal it.

o. Remind them to sign out.

p. Ask them to put their envelope in the slot-box.

q. Sign their research participation slip.

r. Thank them for coming.

3. Instructor Script for Debriefing Participants

Instructions. The nature of the study conducted by Hans Haltom, required participants to be given an explanation that differed from the real intention of the study. In these instances, there is an ethical obligation to inform participants of the real intention, once the experimental procedures are over. The following announcement can be issued now that all the necessary participants have been surveyed; the experimental procedure is over. I apologize to those students who signed-up for this study, but could not be reached by telephone before the procedure's conclusion. Please note the attached list of your students who participated in my study; if agreeable, issue them one of the included copies of a letter intended to debrief them. Thank you for all your cooperation. If you have any questions, or concerns, please call 341-9776.

Hans Haltom, Graduate Student, Clinical Psychology

I. Those who participated in the study on crime and general accident prevention will need to take one of the letters I am passing around.

The appropriate number of copies of the following letter were issued once all the necessary participants had been surveyed. The letter text was as follows:

Dear Participant,

Thanks once again for your cooperation in the experimental task you recently took part in. As you may recall, it was initially introduced as a survey of crime and general accident prevention. Now that all participants have completed the procedure, I am ethically obligated to inform you that the survey was not concerned with crime and accidents. The article about the escaped criminal was true and came from the Emporia Gazette; however, the criminal was caught before the article was read to you. The survey was not interested in the development of an ad campaign, either. Although all the items included in the ad were true, residences in Emporia have been broken into, personal property has been tampered with, and so on, I am not aware to what degree. These acts have probably happened in any town in varying degrees. Please continue to exercise your universal precautions as you normally would. The experiment was only interested with how the stimuli, or article and ad, would affect feelings of confidence about property security. It was especially interested in these feelings among those who are more concerned with checking items such as locks, etc. Your data will still be kept completely confidential with absolutely no name assigned to them. If you have any questions, or concerns, please call 341-9776.

Sincerely, Hans Haltom, Graduate Student, Clinical Psychology

APPENDIX B

INFORMED CONSENT DOCUMENT

The Division of Psychology and Special Education at Emporia State University supports the practice of protection for human subjects participating in research and related activities. The following information is provided so that you can decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at anytime, and that if you withdraw from the study, you will not be subjected to reprimand or any other form of reproach.

The study you are participating in is interested in how an article and ad affect both beliefs and behaviors. You will be asked to complete a small collection of surveys–coupled with examining an article and ad. The article and ad contain no objectionable material. It will take approximately 30 minutes. The only anticipated discomfort you may feel is that related to a decision-making process where you are trying to remember whether you performed an action or not.

A portion of this study's intent cannot be revealed until after you complete the experimental task–as to not affect the results. If at that time you decide you would rather not have your confidential information included in the study, even though you may sign this, it will be shredded along with your results at your request. Should you decide this, call Hans Haltom at 341-9776 within one week of receiving a letter in class indicating the study's conclusion. The information will not be included in the study and again you will receive no reprimand or reproach.

Should you decide to permit the use of your data in this study, it is assured that it will be kept completely confidential. No name, or any other identifying information will be released–only your score computed with a group of other scores. If you are an Introductory Psychology student, you may receive credit for your class for participating in this study. You are free to get up at any time, leave during the procedure and come back, or again, leave entirely if you feel uncomfortable. Any time during the procedure, you are free to ask questions, or if you have concerns later, again please call Hans Haltom, 341-9776.

I have read and feel satisfied with the explanation of the study I am considering taking part in. I am aware of the possible risks involved in this study. I know that I can ask questions at any time and if I feel uncomfortable about anything at all during the experiment–may leave without explanation and consequence and any paper I worked on until that point will be shredded and not included in the study.

_____ _____

Subject Date

APPENDIX C

For each question, circle one number that best describes your feeling upon reading the question.

1. How confident do you feel that crime is a serious issue?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

2. How confident are you that you take steps to secure your property?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

3. How confident do you feel that the door of your residence is locked?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

Answer the following if you have an automobile:

4. How confident do you feel that your automobile is locked?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

5. How confident do you feel about your safety in your community?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

Answer the following if you have a bicycle:

6. How confident do you feel that your bicycle is safe?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

7. How confident are you that your safety measures, such as night, outdoor lighting is adequate?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

8. How confident are you that you have control against crime?

not at all confident	somewhat confident	moderately confident	extremely confident
1	2	3	4

APPENDIX D

Demographic Form

1. Gender: M or F
   Circle

2. Age:_____

3. Have you completed a college level Introductory Psychology course? Y or N
   Circle

4. Are you currently enrolled in an Introductory Psychology course? Y or N
   Circle

5. Are you a psychology major? Y or N
   Circle

APPENDIX E

Instructions: Please answer each question by putting a circle around the 'TRUE' or the 'FALSE' following the question. There are no right or wrong answers and no trick questions. Work quickly and do not think too long about the exact meaning of the question.

1.	I avoid using public telephones because of possible contamination.	TRUE	FALSE
2.	I frequently have nasty thoughts and have difficulty getting rid of them.	TRUE	FALSE
3.	I am more concerned than most people about honesty.	TRUE	FALSE
4.	I am often late because I can't seem to get through everything on time.	TRUE	FALSE
5.	I don't worry unduly about contamination if I touch an animal.	TRUE	FALSE
6.	I frequently have to check things (e.g. gas or water taps, doors, etc.) several times.	TRUE	FALSE
7.	I have a very strict conscience.	TRUE	FALSE
8.	I find that almost every day I am upset by unpleasant thoughts that come into my mind against my will.	TRUE	FALSE
9.	I do not worry unduly if I accidently bump into somebody.	TRUE	FALSE
10.	I usually have serious doubts about the simple everyday things I do.	TRUE	FALSE
11.	Neither of my parents was very strict during my childhood.	TRUE	FALSE
12.	I tend to get behind in my work because I repeat things over and over again.	TRUE	FALSE
13.	I use only an average amount of soap.	TRUE	FALSE
14.	Some numbers are extremely unlucky.	TRUE	FALSE
15.	I do not check letters over and over again before posting them.	TRUE	FALSE
16.	I do not take a long time to dress in a morning.	TRUE	FALSE
17.	I am not excessively concerned about cleanliness.	TRUE	FALSE
18.	One of my major problems is that I pay too much attention to detail.	TRUE	FALSE
19.	I can use well-kept toilets without any hesitation.	TRUE	FALSE
20.	My major problem is repeated checking.	TRUE	FALSE
21.	I am not unduly concerned about germs and diseases.	TRUE	FALSE
22.	I do not tend to check things more than once.	TRUE	FALSE
23.	I do not stick to a very strict routine when doing ordinary things.	TRUE	FALSE
24.	My hands do not feel dirty after touching money.	TRUE	FALSE
25.	I do not usually count when doing a routine task.	TRUE	FALSE
26.	I take rather a long time to complete my washing in the morning.	TRUE	FALSE
27.	I do not use a great deal of antiseptics.	TRUE	FALSE
28.	I spend a lot of time every day checking things over and over again.	TRUE	FALSE
29.	Hanging and folding my clothes at night does not take up a lot of time.	TRUE	FALSE
30.	Even when I do something very carefully I often feel that it is not quite right.	TRUE	FALSE

APPENDIX F

Barry Owens
The Emporia Gazette

COUNCIL GROVE Scotty Adam was still on the loose this morning, avoiding the dogs, helicopters and about 60 law enforcement officers that searched for him through the night.

Adam **escaped** from the Morris **County jail** around 3 p.m. Tuesday, according to the Kansas Bureau of Investigation.

A few hours earlier, Adam had been sentenced to more than 40 years in **prison** for the beating death of his girlfriend's son, 16-month-old Timothy Post.

Scott Teeselink, spokesman for the KBI, said this morning the search for Adam is continuing in and around Council Grove."

Teeselink said the search continued through Tuesday night and search teams were in full force again today.

With the daylight again, that's a definite plus," he said.

Adam, who is 5 feet, 8 inches tall, weighs 130 pounds and has blue eyes, was last seen wearing camouflage pants and a white, long-sleeve Mickey Mouse sweatshirt.

A dispatcher at the Morris **County** Sheriff's Department said Adam may also be wearing a red flannel shirt that he requested before going outside to the **jail's** exercise area Tuesday.

The important thing is, if anybody sights him, they should call 1-800 KS CRIME," Teeselink said. We don't want anyone getting hurt."

Tuesday's search focused on an expanse of soybean and corn fields between the city's sewage treatment plant and the heavily wooded Neosho River bottoms on the southeast edge of Council Grove, about one mile east of the **jail**.

Adam **escaped** when deputies let him into a recreation area outside of the **jail** for a smoke break, Teeselink said.

The Associated Press reported that a girlfriend visited Adam at the **jail** before he **escaped**. Teeselink said he did not think Adam had assistance in the escape.

Members of Adam's family were at the sheriff's office Tuesday afternoon following his escape, but declined comment. KBI agents also questioned Jessica Post, Adam's girlfriend and mother Timothy Post, after the escape.

Teeselink said he did not know what, or if, any special security measures were in place at the time of Adam's escape.

He also said he did not know if prisoners were being allowed in the exercise yard today.

Sgt. John Eichkorn of the Kansas Highway Patrol, said the department loaned men and equipment to the search.

We had 23 people assisting in the manhunt," he said. One fixed-wing airplane, two helicoptors, and three canines trained in tracking," he said.

Chase, Geary, and Lyon **County** deputies also assisted in the search.

We were checking our side of the **county** line to see if we could find out whether he crossed over," Lyon **County** Sheriff Cliff Hacker said this morning. That was probably

the most efficient use of our personnel ."

The northwest edge of Lyon **County** borders Morris **County**. Council Grove is 17 miles west of the Lyon **County** line.

Hacker said two Lyon **County** officers helped with the search.

Earlier in the day, Morris **County** Judge David Platt went beyond sentencing guidelines to give the 24-year-old Adam double the recommended sentence for second-degree murder.

The 500 months imposed by Platt was the maximum allowed.

Platt cited Adam's conviction in 1993 for involuntary manslaughter in the stabbing death of 19-year-old Kansas State University student Scott Sanders, Junction City, as reason to exceed sentencing guidelines.

Two lives taken by you is enough," Platt said.

Sanders' parents were in court Tuesday and said they were pleased with Adam's sentence, but sorry it hadn't happened earlier.

We're very sorry this didn't happen in 1993," said Louann Sanders.

Reached at home Tuesday night, Ernie Sanders, Scott's father, said the family had heard that Adam **escaped**, but declined comment.

The above article (Owens, 1999) appears as it was issued to the experimenter by the Emporia Gazette.

APPENDIX G

A SERIOUS ISSUE.

EVEN IN EMPORIA:

APARTMENTS, DORMS, HOMES, &
CARS HAVE BEEN BROKEN INTO.
CITIZENS HAVE BEEN ASSAULTED.
BICYCLES HAVE BEEN STOLEN.
VANDALISM OCCURS.

CONTROL IT!

DO YOUR PART:

- ✓ **LOCK YOUR DOORS.**
- ✓ **DO NOT PUT YOURSELF AT RISK.**
- ✓ **WHEN NOT CYCLING, USE A BIKE LOCK.**
- ✓ **PROVIDE ADEQUATE LIGHTING AROUND YOUR PROPERTY.**

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Hans P H Haltom

Signature of Author

5-1-01

Date

The Effects of an Anxiety Stimulus on Confidence Ratings Among Nonclinical Checkers

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Signature of Graduate Office Staff Member

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