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PUBLIC AND PRIVATE SELF-CONSCIOUSNESS
AND REALITY MONITORING ABILITY

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DEPARTMENT OF PSYCHOLOGY

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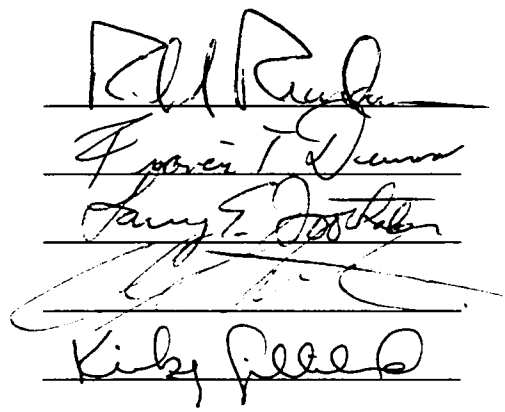

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Abstract

How well one remembers information from the social environment will directly affect how well he or she can interact in that environment. Past research supports the notion that people with certain types of personality traits will be better able to interact within specific social contexts. A series of experiments was conducted to test the role that the private and public self-consciousness disposition may play in affecting subjects' abilities to recall the sources (internally-generated or externally-perceived) of memories--this ability is known as reality monitoring. It was predicted that subjects with dispositionally high or dispositionally low levels of private or public self-consciousness would show different degrees of reality monitoring ability, based on their use of different degrees of cognitive reflection. Although no reality monitoring differences were found between the two levels of self-consciousness, support for different types of read/generate effects were found for item-specific processing strategies vs. global processing strategies.

Public and Private Self-Consciousness and Reality Monitoring Ability

The self can be thought of as an articulated schema that organizes semantic and episodic memories about the self, and that controls the processing of self-referent information (Nasby, 1989a). Under certain conditions, we are motivated to evaluate circumstances using our self-concept as an orienting device. Past research has focused on numerous orientations that the self may take when interpreting the social environment (e.g., self-efficacy, Bandura, 1977; internal/external correspondence, Brickman, 1978; self-esteem, Jones, 1990; self-awareness, Wicklund & Duval, 1971; and self-consciousness, Fenigstein, Scheier & Buss, 1975).

One model in the cognitive literature that may be useful in explaining how self-concept may influence our interpretations of the social environment is the Multiple-Entry, Modular memory system (MEM; Johnson, 1983). According to MEM, we are able to reflect on information in our memory, so we are able to differentiate between memories that are internally-generated (e.g., fantasies) and those that are externally-perceived (Johnson, 1983, 1990b). This process, called reality monitoring, moderates self and non-self distinctions (see for example, Durso, Reardon & Jolly, 1985) in our cognitive appraisals of the environment. If we were not able to distinguish memories for information that we generated ourselves (e.g., imaginations) from information that we perceived from external sources (e.g., read or heard information), then we would not be able to separate our selves from our external world--we would not be able to place boundaries on what we are and what we are not (Johnson, 1990a; Johnson & Malthaup, 1992; Reardon & Doyle, 1995).

MEM and Reality Monitoring

According to the MEM model (Johnson, 1983; 1990b), memory processes can be organized into two functional levels, perception and reflection. The perceptual system in MEM records information that was acquired through perceptual means (e.g., seen, smelled, or heard stimuli), while the reflection system records information that was generated by internal cognitive processes (e.g., imagined or speculated information).

The perception system performs duties associated with interpreting information gathered from the environment through the sensory systems. These interpretations, for example, would include defining and identifying phenomenal events, tracking moving objects, or investigating associations between different objects or events in the environment (Johnson, 1983, 1990b).

The reflection system operates independently of sensory experiences, and allows the individual to interpret the cognitive stimuli beyond their sensory properties. For example, the reflection subsystems permit comparison between existing memories, allow for the anticipation of events that have not yet occurred, and permit cognitive manipulation of newly acquired sensory information.

Johnson & Raye (1981) propose that memories for perceived versus imagined events differ along a number of dimensions. For instance, memories from external origins tend to have a high average value of both perceptual information (e.g., color or sound) and contextual information (e.g., time and place specificity) associated with them. There is little cognitive processing associated with perceptually-based memories because interpretation of externally-derived stimuli typically occurs fairly

automatically; therefore, we are not as aware of the cognitive processes that take place during encoding.

Memories from reflective origins, as compared to externally-derived memories, contain a high degree of information about the cognitive processes that were used in creating the memory (e.g., amount of imagery involved in forming the memory, or memory activation strategies), and less perceptual/conceptual information. So when an individual is asked to determine the origin of a particular memory (i.e., engage in a reality monitoring judgment), he or she will evaluate the perceptual cues and cognitive processing dimensions and then make his or her reality monitoring decision.

Reality monitoring confusions would likely occur if a self-generated memory had a higher average value of perceptual qualities (e.g., vivid color), or if a memory that originated from a perceptual (outside) source had a high degree of reflective properties, such as if the individual spent a lot of time thinking about the perceptual event. Because we are able to reflect, we are able to differentiate between what we experience from the outside world with what we create ourselves within our own cognitions--that is, we differentiate between the self and non-self, and the memories that are created by both entities (Johnson, 1990a).

Self-Orientation

In providing for the development of the self-concept, MEM also offers possible explanations for self-related issues such as self-regulation of behavior (Bandura, 1982), self-consciousness (Fenigstein et al., 1975), and self-awareness (Markus & Sentis, 1982). Self-consciousness and self-awareness are, respectively,

distinguished by the dispositional or situational influences that determine the self-orientation. Individuals with dispositionally or situationally high self-focus are more keenly aware of their self-concept than individuals with lower self-focus (Scheier & Carver, 1981; Nasby, 1989b).

This study proposes that because high self-focused individuals are motivated to view their social world in terms of how the environment affects their self-concept, then any cognitive processes that are influenced by the self-concept will also be affected by self-orientation. For instance, depending on the self-orientation that the individual uses, there can be wide variability in the way that people encode information from social situations (Skowronski, Betz, Thompson & Shannon, 1991). The encoding process has direct effects on reality monitoring abilities because the processes necessary for making reality monitoring decisions are based on comparing the average values of both the cognitive processing variables, and the perceptual/contextual characteristics (e.g., color) of a given memory. Certainly, how one encodes a memory will affect the degree to which these characteristics are embedded in a memory trace.

Self-consciousness. In a factor analytic study using the Self-Consciousness Survey (SCS), Fenigstein et al. (1975) showed that self-consciousness is actually comprised of three factors: Private self-consciousness, public self-consciousness, and social anxiety. Private self-consciousness is the degree to which a person attends to his or her inner thoughts and attitudes when interacting with the environment. For instance, the high private self-consciousness individual is very introspective and is very likely to rely on internal feelings and attitudes. These interpretations do not

necessarily ignore perceptual experiences (i.e., do not ignore environmental cues), they just tend to be based on, or compared with, previously formed internal beliefs, attitudes, or perspectives.

Public self-consciousness is the degree to which someone is aware of the self as a social object. For instance, individuals high in public self-consciousness interpret their environment by directing their attention to the reactions of others. The high public individual will then adjust his or her behavior to more closely fit the perceived social requirements of the situation. Reflective processes are relied on by the public individual for interpretation, but in addition, it should be noted that perceptual processes are also required to initially gather information from the setting that is used for the reflective assessment.

Simply stated, the public and private distinction is defined in terms of the degree to which a person views the self as a social object, and the degree to which a person views the self in terms of his or her inner thoughts, beliefs and attitudes, respectively. Fenigstein et al. (1975) stated that these two dimensions are qualitatively, though not quantitatively, independent constructs, so a person shows some degree of both public and private self-consciousness.

Fenigstein et al. (1975) defined social anxiety as the degree to which a person experiences discomfort in the presence of others. Social anxiety was found to have a fairly low (0.20), but significant, correlation with public self-consciousness, and a near zero correlation with private self-consciousness. These correlational findings make intuitive sense in that the discomfort of social anxiety seems to be due to apprehension about the evaluation of behavior in a social setting, and public self-orientation is a

means by which we evaluate our behavior. However, high public self-orientation does not guarantee anxiety associated with that evaluation; some people may experience the anxiety and some may not.

Self-awareness. As previously noted, self-consciousness is dispositional, while self-awareness is situational (Wicklund & Duval, 1971; Wicklund & Frey, 1980). Later conceptualizations of self-awareness also included the public versus private distinction (e.g., Scheier & Carver, 1981; 1983). Because self-awareness is situationally influenced, it can be fairly easily manipulated in research programs. For example, researchers can increase private self-awareness by placing a mirror in front of an individual. This manipulation increases the focus that the subject places on his or her personal thoughts and beliefs (cf. Gibbons, 1983; Nasby, 1989b; Wicklund & Duval, 1971). By placing the individual in front of an audience or camera, researchers can increase public self-awareness. This type of manipulation increases the subject's focus on his or her self as a social object (Scheier & Carver, 1983; Buss, 1980). Because of the similarities in predictions and research findings between self-awareness and self-consciousness, Buss (1980) suggested that it is safe to generalize results from one construct to the other.

If self-orientation indeed affects the degree of reflection or perception that a person uses when interpreting his or her environment, then reality monitoring ability should be affected by that difference.

Interactions between self-awareness and self-consciousness. Self-consciousness and self-awareness may differentially affect the point of view that one takes when interpreting social situations; however, they are not completely

independent of each other (e.g., Snyder & Ickes, 1985; Buss, 1980; Scheier & Carver, 1981). For instance, if an individual has a strong predisposition to view the environment from one perspective, then those predispositions may be augmented or diminished by various situational cues in the environment (Scheier & Carver, 1981). For example, individuals who tend to view themselves as social objects (i.e., high public self-consciousness) should be more strongly affected by others' reactions toward them than should individuals who do not view themselves as social objects. Conversely, individuals with low private self-consciousness may be less affected by the presence of a mirror when filling out a self-report questionnaire than someone with high private self-consciousness. The dispositional influences of self-consciousness and the situational influences of self-awareness are interactive.

General Research Findings with Self-Consciousness and Self-Awareness

The appeal of private and public self-consciousness and self-awareness is that they explain influences on behaviors that directly affect social interaction processes. For example, as compared to people with low private self-consciousness, people high in private self-consciousness, or in states of high private self-awareness, have a greater sense of their own attitudes, values and emotions (Scheier & Carver, 1983), and there tends to be a higher correlation between their attitudes and subsequent behaviors (see also Froming & Carver, 1981; Gibbons, 1983). Research also supports the notion that there tends to be higher predictive validity in self-report measures with high private versus low private subjects (e.g., Wicklund, 1982; Nasby, 1989b).

Another appeal is that the public and private distinctions of self-consciousness and self-awareness are potentially relevant to research on predictions made with MEM

in terms of differences in the degree of reflective and perceptual elaborations that are used in the formation of memories for understanding one's self. For example, Scheier & Carver (1983; see also, Nasby, 1989a; Abrams & Brown, 1989) indicated that people with high private focus tend to rate "personal identity" variables (e.g., intelligence, cognitive ability, personal coping strategies, and introspective abilities) as very important aspects of their own, as well as others', personalities. People with low private focus tend to rate these variables as less important components of personality.

High public individuals, on the other hand, generally rated "social identity" variables as very important (Scheier & Carver, 1983). These variables describe traits or behaviors that are necessary for competent social interactions to take place, and include physical features, speaking style, gesture exhibition, and group membership. Notice that these variables focus on the processes that are necessary for social interactions; they do not directly focus on the individual's beliefs or attitudes. Low public individuals did not rate the social identity variables as important. Thus, the subject's self-orientation affects the definitions of the self that the individual uses.

Another method of studying the proposed cognitive differences that exist between public and private self-consciousness has focused on the efficiency (e.g., speed) of processing self-referent information (Nasby, 1989a). By assessing the speed of processing of information, researchers can infer the degree to which a schema is articulated (e.g., Fiske & Taylor, 1984). Turner (1978) found that high private subjects more quickly responded to personal identity variables (e.g., "I am smart"), while high public subjects more quickly responded to social identity variables (e.g., "I am an effective speaker"; see also, Nasby, 1985; Kihlstrom & Cantor, 1983), again

showing a difference in how the individual describes the self.

MEM could explain these identity variables and the cognitive efficiency findings by noting that high private subjects will reflect on personal information that describes the self-concept. This greater reflection on the internally-oriented information should increase the degree of articulation of the self-schema from the internal perspective; hence, recall efficiency for that information should be high (i.e., I know myself because *I* think about myself). On the other hand, the high public individual reflects on information the he or she gathers from the environment (e.g., how others react to his or her comments/behaviors). Therefore, the high public individual defines his or her self more clearly from the social perspective (I know how to act because I think about how *others* view me). The private individual attends to, and encodes, information related to his or her perceived sense of personal self; the public individual attends to, and encodes, information related to factors in the social environment. Hence, the information that ought to be easiest for either subject to recall should be congruent with his or her internal or external focus.

Note, however, the high private individual does not necessarily have to rely on the perceptual system proposed by MEM when interpreting internalized attitudes/perspectives. The self-related memories need not have many, or any, perceptual cues within the memory trace. On the other hand, the high public subject must rely on both perceptual and reflective processing because one must gather reactions of others from the social environment before he or she can reflect on the information, and decide how to adjust behavior to fit that environment. Therefore, the high public subject, because he or she must use both the perceptual and the reflective

systems, should find both perceptual cues and cognitive processing cues in his or her memory traces of self-relevant social information.

By understanding the cognitive processes that one uses, then the individual should be able to more effectively, or at least more veridically, interpret his or her social surroundings. Using the MEM framework, predictions about reality monitoring ability are based on the degree of reflection and degree of perception that is used in both public and private self-orientations. For instance, an understanding of one's attitudes (i.e., attitude awareness) and self-identity (i.e., personal identity and social identity) requires self-reflection. Without reflection, the individual is not completely aware of his or her own attitudes or identity.

General predictions for private and public self-consciousness from MEM

As was previously stated, when making predictions about the role of self-consciousness on reality monitoring, two dimensions must be taken into account: First, the degree of perceptual/contextual cues that are associated with a given memory, and second, the degree of cognitive processes that are involved in the formation of the memory. If the two values are divergent (e.g., high levels of cognitive processing information, with low levels of perceptual/contextual information), then the reality monitoring decision is fairly easy to make. However, if similar degrees of both dimensions are present (i.e., nearly equal average values of cognitive processing information and perceptual/contextual information), then the reality monitoring task becomes more difficult (Johnson, 1990a), and the likelihood of making a reality monitoring confusion increases. A reality monitoring confusion is defined as an inability to correctly identify the source of a memory, and two specific

types of confusions may occur. In an I-E confusion, the subject attributes an internally generated memory to an external source. In an E-I confusion, the subject attributes an externally perceived memory to an internal source.

The source of the memory (internal vs. external) will influence the average values of both perceptual/contextual information and of cognitive processing information associated with the memory (Johnson & Raye, 1981). For instance, as was previously noted, internally generated memories will have high degrees of cognitive information, but low degrees of perceptual/contextual information. Externally perceived memories, on the other hand, will have high contextual/perceptual average values, but few cognitive processing cues.

It is proposed here that the high vs. low self-consciousness disposition will also affect cognitive processing and perceptual/contextual average values. It is further proposed that the public and private distinctions will show differential effects on those average values, which will, in turn, affect reality monitoring ability.

Private self-consciousness. The high private self-consciousness individual is habitually aware of his or her self (Nasby, 1989b), which should increase his or her tendency toward using reflection. This habitual reflection should increase the likelihood of embedding cognitive processing variables into newly created memories. Note, however, that the private self-orientation does not allow for a specific prediction on the average value of perceptual/contextual cues because the reflective processing behaviors can be directed toward information from either the external environment or from a previously internalized memory. The low private self-consciousness individual does not have the consistent tendency to use reflective processes, so the memories that

he or she creates will tend to contain lower than average values of cognitive processing information, as compared to high private self-consciousness individuals.

To create predictions for reality monitoring confusions, one must estimate the average value of both the cognitive processing variables, and the perceptual/contextual cues. These average values are formed by the cumulative effect of the level of private self-consciousness and by the source of the memory (see Figure 1). For example, a high private subject who reads a complete word (external memory source) will show high cognitive processing (due to habitual reflection), but the word itself will add very little additional processing value because of the automatic processing associated with reading. The resulting cumulative cognitive processing effect is at a moderate value level. For the perceptual information, the level of self-consciousness is not inherently predictable, but the external memory source creates high contextual cues, so the cumulative perceptual information is of high average value. Figure 1 shows qualitative cumulative averages for each cell in a 2 (level of self-consciousness) X 2 (memory source) design.

Because reality monitoring sensitivity is greatest when average values between cognitive processing and perceptual/contextual cues are most discrepant, then one can predict that the greatest sensitivity to reality monitoring (i.e., fewest confusions) should occur in the low private/external source (low/external) and the high private/internal source (high/internal) conditions (see Figure 1). If we assume that reality monitoring decisions become easier as we acquire additional perceptual/contextual or cognitive processing information, which makes common sense, then reality monitoring sensitivity should be lower in the high private/external

source (high/external) condition, as compared to the low/external and high/internal conditions. The low private/external source (low/external) condition should show the least sensitivity (i.e., the greatest number of confusions) because little memory information is available to the subject, and the average values between cognitive processes and perceptual cues should be similar.

These predictions support a cross-over interaction result for sensitivity of reality monitoring abilities for the private self-consciousness subject when presented with non-trait words from an internal and external source. No main effects for either memory source or degree of self-consciousness are predicted.

Public self-consciousness. By using the logic posed in the private self-consciousness predictions, the public self-consciousness predictions follow suit. For instance, again, external memory sources (read words) will have high perceptual/contextual and low cognitive processing average values; internal memory sources (generated words) will have low perceptual/contextual and high cognitive processing average values.

The estimates of average value for the public self-consciousness subjects however, are different from the estimates of the private individuals. Because high public self-consciousness relies on gathering information from the environment, and then submitting that information to reflection (to determine how one should respond), then estimates for both perceptual *and* cognitive processing average values must be made. Remember that perceptual cues were not readily predictable for the private self-consciousness individual. The high public subject must attend to his or her environment to gather accurate data for processing. That habitual attention to the

environment should create high perceptual/contextual cues in the memories of high public self-consciousness individuals. That is, they continually search the environment for cues that may affect their sense of self as a social object. Additionally, they must reflect on those gathered cues to allow them to make decisions pertaining to the necessity for adjusting their behavior so it more closely corresponds to their environment. The reflection process will then increase the cognitive processing variables that were contained within the high public subjects' memories. Simply stated, the high public subjects should show high average value for both perceptual/contextual *and* cognitive processing variables in their memory traces.

Using the same average values for internal vs. external memory source, as shown in Figure 1, new cumulative average values must be created for the public self-consciousness subject (see Figure 2). If we again assume that there is a positive correlation between the sensitivity of the reality monitoring judgment and the amount of perceptual/contextual and cognitive processing information that one receives, then the high/external and high/internal conditions should show greater sensitivity to reality monitoring than the low/external and low/internal conditions. The only statistical prediction that will be made for reality monitoring sensitivity will be for a main effect between the levels of public self-consciousness--high publics will show a greater sensitivity to reality monitoring decisions than low publics, regardless of the source of the memory. No interaction is predicted.

Recognition memory. It is common in reality monitoring research to test the recognition memory of the subjects, so those computations were completed as secondary analyses. Because they were secondary, no particular predictions were

made concerning their effects.

Pilot Study: Testing Procedures

In order to test research procedures, a pilot study was completed. This section will briefly describe the procedures that were used, and then discuss the outcome of the techniques in terms of how they impacted protocol for the later research program. For a complete account of the methods, results, and discussion of the pilot study, see Appendix 1.

To test the relationship between private self-awareness and reality monitoring ability, half of the subjects completed a simple reality monitoring task seated in front of a mirror, while the other half completed the task without the presence of the mirror. The study phase of the experiment involved reading descriptive sentences of trait words (e.g., happy or mean), then rating those trait words for the degree to which they described the subject's own personality. The reality monitoring manipulation was completed by simply presenting half of the traits as complete words (read condition), and the remaining half as word-fragments (generate condition). After an intervening distracter task, subjects were asked to identify which trait words had been seen as complete, and which had been seen as word-fragments during the study phase.

No significant difference for sensitivity to read vs. generated trait words between the mirror manipulation groups was found. One possible explanation for the non-significant finding is that because the trait words were embedded in a self-referent context, then private self-focus was situationally enhanced. Because the subjects were asked to rate how well the trait word described their own personality, then regardless of the presence or absence of a mirror, private self-awareness was enhanced. The trait

words were confounded with the mirror manipulation.

Experiment One

In order to address the problems noted in the pilot study (see Appendix 1), Experiment 1 involved three methodological changes. First, instead of using the situational self-awareness manipulation (i.e., the presence of a mirror), Experiment 1 relied on the dispositional self-consciousness blocking variable. Because of the dispositional nature of self-consciousness, this change should provide for greater control and stability of the type and degree of self-orientation that the subjects use. Secondly, instead of trait words, common nouns were used as testing materials. By using non-traits, self-focus should not have been confounded by the test stimuli, as may have occurred in the pilot study (i.e., low private self-conscious subjects should not be situationally induced to focus on the self). Finally, the experimental stimuli were presented via videotape format, as compared to the paper and pencil format used in the pilot study, thus allowing for greater control over possible experimenter or list presentation effects. Additionally, this procedure controlled the rate at which the subjects were introduced to the word list, thereby controlling for differences in practice effects between subjects. This format has worked successfully in other experimental designs (cf. Durso et al., 1985), so the reliability of this procedure has been previously demonstrated.

In Experiment 1, it was hypothesized that a cross-over interaction would occur between the levels of private self-consciousness and the source of the memory (internal vs. external) for the sensitivity of reality monitoring ability. Specifically, the high/internal and low/external conditions should show greater reality monitoring

sensitivity than the low/internal and high/external conditions (see Figure 1).

Method

Subjects. Undergraduate students from introductory-level psychology classes at the University of Oklahoma were pretested with the SCS (Fenigstein et al., 1975; see Appendix 2) to determine their degree of private self-consciousness. Those students who scored within the upper (high private) and lower (low private) quartiles of the sample distribution were invited to participate in the study. Ultimately, 25 high private (M = 32.5) and 20 low private (M = 16.6) subjects completed all phases of the experiment. All of the subjects received extra credit in their respective classes for their participation.

Note that due to the difficulty of obtaining subjects who scored in the low ends of the SCS continuum, data from 11 of the subjects from this sample were also used in Experiment 2 analyses. Because no statistical comparisons were ever made between subjects in Experiment 1 and subjects in Experiment 2, no statistical problems associated with independence assumptions should arise.

Testing Materials. The materials and procedures of this experiment generally followed those used by Durso et al. (1985). Forty sentences (see Appendix 3) were created and normed such that the last (target) word in each sentence was highly predictable from the context of the sentence (e.g., Frozen water is called ice; For breakfast I had scrambled eggs).

To control for a possible materials confound, two versions of the 40 sentences were developed (list A & list B) such that in list A, half of the sentences (selected at random) had the terminal word omitted (incomplete sentence), and the remaining half

of the sentences had the terminal word present (complete sentence). For list B, the sentences and their order were identical, except that the pattern of complete and incomplete target words was reversed (see Footnote 1).

To reduce the possibility of primacy and recency effects, 10 additional sentences (half complete and half incomplete) were added to the beginning and to the end of each of the two lists, and the sentences were not used in subsequent analyses. The study lists were presented to the subjects on a videotape displaying a female experimenter reading the sentences in a monotone voice at a 7 second rate.

Distracter Tasks. The Shipley-Hartford intelligence scales (Sines, 1958), the Need For Cognition scale (NFC; Cacioppo, Petty, & Kao, 1984), and a 15-item demographic survey (e.g., age, gender, academic major, etc.) were used as retention interval distracter tasks.

Procedure. The subjects were tested in small groups (5-10 subjects each). During the study phase of the experiment, each group was instructed to view the videotaped presentation of the sentences. They were also informed that if an incomplete sentence was presented (i.e., the terminal word was missing), then they were to silently complete the sentence on their own. A practice trial was given to demonstrate the generation procedure. Additionally, the subjects were instructed that after hearing each sentence, they had to rate the trueness of the sentence on a 5-point Likert scale. The trueness ratings were utilized to ensure that the subjects were paying attention to the stimuli, but the ratings were not used in later analyses.

After the sentence presentations, the subjects completed the demographic survey, the NFC scale and the Shipley-Hartford scale. Upon completion of the

distracter tasks, the subjects were given a list of 60 randomly ordered words. Twenty of the words had been the terminal words for complete sentences presented in the study phase (i.e., were heard by the subject), 20 had been the terminal words for incomplete sentences presented in the study phase (i.e., were generated by the subject), and 20 had not been presented in the study phase at all (new words). The subjects were instructed to identify whether each word on the list had been heard, thought or not presented during the study phase.

Results

Reality monitoring analyses. Because the raw number of confusions committed was small ($M = 4.6$), only descriptive statistical analyses were computed for the reality monitoring data. Remember that two types of confusions may have occurred: read confusions and generate confusions. A read (or in this case, heard) confusion occurred when a subject responded "thought" to a target word presented in a complete sentence. A generate confusion, on the other hand, occurred when a subject responded "heard" to a target word that had been omitted (i.e. an incomplete sentence trial) during the study phase of the experiment.

The proportion of each type of confusion was calculated for each subject, and the mean percentages for each type are presented in Table 1. As is noted in Table 1, subjects tended to make more generate confusions than read (heard) confusions.

Memory analyses. Signal detection analysis was used to test recognition memory differences because it computes discrimination sensitivities without individual response biases. The d-prime (d') score is a measure of the distance (in standard deviation units) between the mean value of a "signal" distribution and the

mean value of a "noise" distribution. The larger the d', the greater the distance between the two distributions, thus signifying a greater ability to discriminate "signal" stimuli from "noise" stimuli.

The memory analyses allow for a comparison of recognition memory differences between the groups, regardless of errors involved in understanding the source of the memory (i.e., internally generated or externally derived). A "hit" in the memory analyses was defined by instances where the subject indicated that he or she had experienced the target word, either heard or generated, during the study phase of the experiment. Instances where the subject indicated that a target word had not been previously experienced were not included in these analyses, because the target word(s) had not been correctly remembered by the subject.

Two "signal" distributions were created in the recognition memory analyses--one for the correctly recognized generated target words, and one for the correctly recognized heard target words. Both distributions were compared with the "noise" distribution, which corresponded to the foils, which had not been previously encountered in the study phase of the experiment. In the recognition memory analyses, a large d' indicated that the subject was able to accurately discriminate between target words and foils.

A d' value was computed for each subject, then mean d' scores for each condition were tested using a 2 (level of private self-consciousness) X 2 (heard vs. generated word) mixed ANOVA, with word type being the repeated factor.

A significant main effect for sensitivity of recognition memory was found between the read (complete) and generated (partial) target words ($F(1, 43) = 18.65$, p

< .01; see Table 2 for means). No significant main effect for recognition memory ability was found for level of private self-consciousness ($F(1, 43) = .71$, $p > .05$), nor for an interaction between word type and level of self-consciousness ($F(1, 43) = .8$, $p > .05$). A general discussion of these findings will be presented after Experiment 2.

Experiment Two

Experiment 2 was designed to investigate the effects of public self-consciousness on reality monitoring ability. It was predicted that there would be a significant main effect for the level of public self-consciousness on the sensitivity of reality monitoring ability; specifically, the high public subjects would have greater reality monitoring abilities than the low public subjects.

Method

Subjects. Undergraduate students from introductory-level psychology classes at the University of Oklahoma completed the SCS (Fenigstein et al., 1975) to determine their degree of public self-consciousness. Those students who scored within the upper (high public) and lower (low public) quartiles of the sample distribution were invited to participate in the study. Ultimately, 23 high public ($M = 25.1$) and 21 low public ($M = 8.5$) subjects completed all phases of the experiment. All of the subjects received extra credit in their respective classes for their participation.

Materials and procedure. The materials and procedures for Experiment 2 were identical to those used in Experiment 1.

Results

Reality monitoring analyses. Again, because the raw number of confusions

was small (M = 3.86), proportions of each type of confusion were calculated for each subject; mean read (heard) and generate confusions are presented in Table 3. As in Experiment 1, subjects tended to make more confusions with words that they had generated than with words that they had read (heard).

Memory analyses. Following the same procedures as used in Experiment 1, d' values were calculated for each subject, then mean d' scores for each condition were tested using a 2 (level of self-consciousness) X 2 (read vs. generated word; repeated factor) mixed ANOVA. Results showed that there was a reliable main effect for recognition memory sensitivity between the two word types ($F(1, 42) = 16.2$, $p < .01$; see Table 4 for means). There were no significant differences for recognition memory ability with the level of public self-consciousness main effect ($F(1, 42) = .21$, $p > .05$), or for the interaction between level of public self-consciousness and word type ($F(1, 42) = .23$, $p > .05$).

Discussion for Experiments 1 and 2

There was a significant main effect for recognition memory by word type (read vs. generated). The subjects, regardless of their degree of private or public self-consciousness, had better recognition for words that they had generated during the study phase, as compared to words that they had read during the study phase. This "generation effect" has been documented in previous studies (e.g. Slamecka & Graf, 1978) and supports the notion that subjects were actively participating in the experiment. The generation effect will be further discussed in the General Conclusions section of this paper.

In terms of reality monitoring confusions, in both Experiment 1 and

Experiment 2, subjects tended to make more generate confusions (i.e., respond "heard" to a generated target word) than read confusions (i.e., respond "thought" to a word that was heard). There is little precedence in the literature to explain the confusion tendency pattern, but one possibility may be that the memory (task) strategy that was used by the subjects created the difference.

The task strategy that led to the confusion difference may also have attributed to the generation advantage noted in the recognition memory analyses. The strategy effect will be discussed more completely in the General Conclusions section of this paper.

In both Experiments 1 and 2, different degrees of private and public self-consciousness were not associated with differences in reality monitoring abilities. The prediction that there would be a cross-over interaction for private self-consciousness and memory source was not supported. The second prediction, that high public subjects, as compared to the low public subjects, would be able to more accurately differentiate between internally generated vs. externally acquired memories was also not supported by these data.

One possible explanation as to why no reality monitoring effect was noted between the levels of private and public self-consciousness may stem from the choice of target words used as testing stimuli. By using common nouns (non-trait words), the subjects may not have personally identified with the testing stimuli. Because the words were not self-relevant, the subjects did not necessarily invoke the private or public components of their personalities when interpreting the words (cf. Nasby, 1989a; Fenigstein et al., 1975), they only memorized them from a more remote, non-

self perspective. When one does not internalize the words, less reflection is necessary when forming memories about the words (Johnson, 1990a, says that non-pertinent information goes through less reflective processing than pertinent information). Although most of the words were recognized, simple memory does not require the same level of processing as more complex memory tasks (e.g., source of memory).

Possibly then, too much internal focus was used on the trait words in the pilot study, while too little internal focus was used in the non-trait words in Experiments 1 and 2. A compromise had to be reached such that the subjects used moderate degrees of personal involvement when viewing the testing stimuli, thus, personal introspection was used with respect to the target words. However, that effect of personal introspection could not be so extreme as to create a confounding degree of private self-awareness, as may have been found in the pilot study.

General Introduction for Experiments 3 and 4

To address the problems in Experiments 1 and 2, Experiments 3 and 4 incorporated two methodological changes. First, in order to attempt to increase self-awareness to the degree that subjects used their personal orientation when interpreting the testing stimuli, trait words were again used as testing stimuli. However, so as to avoid creating too much internal focus, the words were embedded in sentences that defined/described the trait word from an "other-person" perspective, not from a strictly "personal" perspective (e.g., "Someone who is uncommonly vicious and mean is cruel" vs. "I am uncommonly vicious and mean, so I am cruel"). It was presumed that the difference in wording would decrease the likelihood that the subjects would make specific judgments about their own personality, which is a private self-

awareness manipulation. However, by using trait words, the subjects should have been likely to use, at least to a degree, their self-orientation when interpreting the target word.

The second methodological difference in Experiments 3 and 4 was that the format included both a visual and an auditory presentation of the testing stimuli. A video tape was used to present the trait word (in either complete or word fragment form), as a dubbed-in voice supplied the definition/description of the word. By having the definition/description presented verbally, the subjects could focus their attention on the trait word, thereby decreasing confusion between test words and words in the definition that were not "important" to remember later. Additionally, earlier informal pilot studies showed that it was fairly difficult to accurately predict the target word from the definition, so, by using word-fragments, accuracy in determining the trait word was increased. There is a long history of using word-fragments as generation sources in reality monitoring research (e.g., Reardon & Doyle, 1995; Hirshman & Bjork, 1988). Note, in terms of the reality monitoring manipulation, using word fragments (Experiments 3 and 4) is not conceptually different from using omitted target words (Experiments 1 and 2). In both cases, research (e.g. Slamecka & Graf, 1978) reports similar influences on reality monitoring and memory abilities.

Experiment Three

As noted in the General Discussion for Experiments 1 and 2, there was a need to increase the role that the self played in learning the materials that were presented in the study. Others (Nasby, 1985) have shown that self-relevant trait words are more likely remembered than non-self-relevant trait words, especially if the subject had high

public or private self-consciousness. If the aim of the present studies is to test how variations of self-orientation affect one's perceptions/memories, then using trait words, even though they are "other-person" oriented, should increase relevance enough to invoke the use of private or public self-consciousness.

It was predicted that the outcome of this experiment would mimic those posed in Experiment 1. That is, there will be a cross-over interaction for level of private self-consciousness and word type, with the high/internal and low/external conditions showing greater reality monitoring sensitivity than the low/internal and high/external conditions (see Figure 1).

Method

Subjects. Undergraduate students at North Central Texas College participated in the study to receive extra credit in their introductory-level psychology courses. During a regularly scheduled class period, the students were pretested with the SCS (Fenigstein et al., 1975) to determine their degree of private self-consciousness. The subjects who scored in the upper (high private) and lower (low private) tertiles of the sample distribution were invited to participate in the experiment. Ultimately, 20 high private ($\underline{M}$ = 27.3) and 20 low private ($\underline{M}$ = 16.2) subjects completed all phases of the experiment.

Because it was difficult to obtain an adequate number of subjects who scored in the lower extremes of the SCS continuum (for both private and public self-consciousness), 16 of the subjects in Experiment 3 were also used as subjects in Experiment 4. Because there were never direct comparisons of results between Experiments 3 and 4, there should be no statistical problems (e.g. independence

assumption confounds) associated with the repeated use of these designated subjects.

Testing materials. Sixty trait words were used to construct the testing stimuli for this experiment. The trait words were used as the terminal word for descriptive sentences (see Appendix 4) that were presented to the subjects via VHS video tape. The descriptive sentences described/defined the trait word using synonyms, antonyms and/or examples of behaviors associated with the trait word (e.g., "Someone who is mentally sound and healthy is sane", "People who spend a lot of money on their friends are extravagant"). Due to the possible confound reported in Experiments 1 and 2, the descriptive sentences described the trait from an other-person orientation, not from a self-orientation (e.g., "Someone who is usually cheerful and merry is happy." vs. "I am usually cheerful and merry, so I am happy.")

The descriptive sentences were normed during a previous semester to determine the ease in which the trait words were recognizable, based on the description/definition given in the sentences. In the norming study, the trait word was presented as a word fragment, and subjects simply read the descriptive sentence and filled in the missing letters of the trait word to correctly complete the sentence. Trait words that were correctly completed by a minimum of 95% of the pretest subjects were selected as experimental stimuli. To control for possible primacy and recency confounds, the data from the first and last 10 words/sentences were not used in later analyses.

Reality monitoring manipulation. Half of the 60 trait words (selected at random) were presented to the subject as word fragments (partial words), while the remaining half were presented without missing letters (complete words).

To control for a possible materials confound, two versions of the 60 sentences were developed (list A & list B) such that in list A, half of the sentences (selected at random) had a partial target word, and the remaining half of the sentences had a complete target word. In list B, the sentences and their order were identical, except that the pattern of complete and partial target words was reversed (see Footnote 2).

Distracter tasks. The Need for Cognition scale (Cacioppo et al., 1984), the Shipley-Hartford Intelligence scale (Sines, 1958), and a 5-item demographic survey (e.g., gender, age, etc.) were used as distracter tasks.

Procedure. During the study phase, the subjects viewed a video tape in groups (3 to 10 subjects). The video tape presented the target word in large (approximately 3 inches on a 25 inch monitor screen) block letters for a 9 second interval. As the target word was shown on the monitor, a dubbed-in voice of a female assistant read the description/definition of the target word through the monitor speaker.

Subjects were told that if the word presented on the monitor screen was shown in its complete form, then they were to silently read it, then rate the word on a 5-point Likert scale as to how true the word fit the definition/description that accompanied it. If the word was presented as a fragment, then the subjects were told to complete the word in their heads, and then to rate it for its trueness of definition on the Likert scale. A practice trial was presented to demonstrate the generation procedure. The trueness rating was used as an attention task and was not used in subsequent analyses. After the study phase, the subjects were given the demographic information survey and the NFC (Cacioppo et al., 1984) scale.

After completion of the first two distracter tasks, subjects were given a list of

60 randomly ordered trait words on a sheet of paper. Twenty of the words had been presented as complete, 20 had been presented as fragments, and 20 had not been presented at all during the study phase of the experiment. Subjects were instructed to indicate if the word had been previously presented, and if so, by which format it had been presented (complete or partial). Upon completion of the test phase, the subjects completed the Shipley-Hartford intelligence scale (Sines, 1958).

To test whether the subjects were able to correctly generate the partial words, after the experiment was completed, approximately 10 subjects were given an informal manipulation check. The check involved giving the subjects a short list of the testing materials (definition/description sentences with target words written as fragments), and having them complete the fragments. All subjects were able to successfully solve all of the fragments.

Results

Reality monitoring analyses. As in Experiments 1 and 2, because few confusions were made ($M = 5.2$), only descriptive statistics were computed for the reality monitoring data. Proportions for each type of error were calculated, and mean percentages are presented in Table 5. As the mean percentages show, subjects had a tendency to make more read confusions (i.e. responded "thought" to a read target word) than generate confusions.

Memory analyses. Following the same procedures used in Experiments 1 and 2, the memory analyses showed a significant main effect of word type ($F(1, 38) = 14.79$, $p < .01$; see Table 6 for means) for recognition memory sensitivity (d'). However, no significant recognition difference was noted for the level of private self-

consciousness main effect ($F(1, 38) = .18$, $p > .05$), nor for the interaction between private self-consciousness and word type ($F(1, 38) = 2.37$, $p > .05$). A general discussion of these results will be presented after the Results section of Experiment 4.

Experiment Four

Experiment 4 was completed to investigate the influence of public self-consciousness on reality monitoring ability using trait words. Predictions for this experiment mimic those offered in Experiment 2. That is, there should be a significant main effect for level of public self-consciousness for reality monitoring sensitivity, with the high public subjects showing greater sensitivity than the low public subjects.

Method

Subjects. During a regularly scheduled class period, undergraduate students at North Central Texas College were pretested with the SCS (Fenigstein et al., 1975) to determine their degree of public self-consciousness. As incentive to participate, each subject received extra credit in his or her introductory-level psychology course. Those subjects who scored in the upper (high public) and lower (low public) tertiles of the sample distribution were invited to complete the experiment. Ultimately, 20 high public ($M = 24.4$) and 20 low public ($M = 12.5$) subjects completed all phases of the experiment.

Materials and procedures. The materials and procedures that were used in Experiment 4 were identical to those used in Experiment 3.

Results

Reality monitoring analyses. Again, as before, because the number of confusions that were made was small ($M = 5.7$), proportions for each type of

confusion were calculated (see Table 7 for means). Just as in Experiment 3, the public subjects tended to make more confusions for words that they had read than for words that they had generated.

Memory analyses. Following previously described procedures, mean d' values were subjected to a 2 (level of public self-consciousness) X 2 (word type) mixed ANOVA, with word type being the repeated factor. As in Experiment 3, a significant main effect of word-type for recognition memory was found ($F(1, 38) = 11.21$, $p < .01$, see Table 8 for means). No reliable recognition differences were found for the level of public self-consciousness main effect ($F(1, 38) = .19$, $p > .05$), or for the interaction between public self-consciousness and word type ($F(1, 38) = .09$, $p > .05$).

Discussion for Experiments 3 and 4

A significant main effect of word type for recognition memory was found; subjects were reliably more sensitive to recognizing words that they had read during the study phase of the experiment, compared to words that they had generated. That is, the subjects in Experiments 3 and 4 showed a read advantage for recognition memory.

For reality monitoring confusions, few were made, but the pattern of confusions was consistent in both experiments. That is, subjects tended to make more read confusions (i.e., responded "thought" to complete words) than generate confusions (i.e., responded "read" to word fragments). Again, as in Experiments 1 and 2, a possible explanation for the difference in likelihood of confusions may stem from a memory (task) strategy effect. This effect may also explain the read advantage that was noted in the recognition memory analyses. The task strategy possibility will

be further discussed in the General Conclusions section of this paper.

Finally, subjects in the high vs. low private conditions (Experiment 3), and subjects in the high vs. low public (Experiment 4) conditions, showed no significant differences in their ability to recall the source of their memory for the target words used in the study.

General Conclusions

Analyses of these experiments yielded no reliable memory differences or reality monitoring differences for high vs. low levels of private or public self-consciousness. Although no specific predictions concerning recognition memory were posited for these experiments, the principle findings of these studies are the read and generate effects in the recognition memory data. It is not surprising to find a generation effect in reality monitoring research designs because of the use of partial and complete words in the stimulus lists. However, the *pattern* of read vs. generate effects that were found in these experiments was interesting. As is noted in the discussion sections for each set of experiments, subjects in the first set of experiments more accurately recognized words that they had generated, while subjects in the second set of experiments more accurately recognized words that they had read.

The read and generate effects that were noted in this research are important because they suggest that the experiments were competently performed. Historically, research (cf. Slamecka & Graf, 1978) has shown that if an individual actively generates some stimulus (e.g., completes a word fragment or generates a missing word), then his or her memory for that item will tend to be better than if he or she is directly presented with the stimulus (i.e., reads or hears a complete word). More

recent research, however, has shown that simply generating the information does not always create a better memory for the incomplete stimulus. For instance, factors such as expertise, or types of stimulus materials, may also affect whether or not a generation effect is present (e.g., Reardon & Moore, 1996; Reardon, Durso, Foley & McGahan, 1987).

What led to the memory differences found in these experiments might possibly be explained by Schmidt (1990). Schmidt concluded that when stimuli are presented in a mixed-list format (i.e., some items presented in complete form, while other items are presented in partial form), people are likely to use item-specific processing, at the expense of more global processing. That is, the subject is likely to process each item in the list separately and independently, not as an organized or cohesive array of information. Item-specific processing enhances elaborative processing of the test-items, especially if the individual is actively generating the items versus merely reading them. This elaboration difference results in better memory for the generated items as compared to the read items.

Item-specific processing may also explain why the subjects in Experiments 1 and 2 tended to make fewer read confusions (i.e., "thought" response to a complete word) than generate confusions. Following the argument by Schmidt (1990), I would suggest that because the subjects may have been processing each item individually, then they would have used deep elaboration when forming the memory for each stimulus item, especially for the generated words (hence the generation advantage found in Experiments 1 and 2). When one uses elaborative processing, as compared to shallow processing, he or she creates a stronger memory for the learned information.

Stronger memories are created because the memory traces for the items are likely to contain semantic and conceptual information, as well as cognitive processing and perceptual/contextual information. When one is asked to complete a reality monitoring judgment, the memory trace for the deeply processed information may actually create greater confusion for the subject because so much information is contained in the memory trace--some of which does not influence reality monitoring decisions. This notion supports the contention that subjects who use item-specific processing strategies should make more generate confusions, and fewer read confusions, because more elaboration is used for generated items than for read items.

What would occur, however, if the materials in the mixed-list format encouraged global processing? For instance, by using trait words, a subject is more likely to use global processing strategies because he or she is likely to attempt to organize the traits into a more cohesive picture of "an individual," or of "the self." If one used global processing on a mixed list, Schmidt would suggest that the generation advantage of item-specific processing should disappear. It should disappear because the subject is not deeply processing each individual item, he or she is instead processing each item as it pertains to subsequent items in the list. The subject is trying to create interrelationships among the separate items in the list. The possibility also exists that a read advantage may appear when global processing is used, however, the bulk of the research in the literature focuses on generation effects, so the read advantage possibility is speculation at this point.

In the first set of experiments, subjects were presented with common nouns as target words. The target words were not inherently associated with each other, and

they were presented in mixed-list format, so a generation effect should have been expected. In the second set of experiments, subjects were presented with trait words as target words. Because trait words are more naturally considered as organized representations of people instead of single concepts, then it makes sense that subjects would use a more global processing strategy instead of item-specific processing. It makes sense because if the items build on each other to form a comprehensive schema, then one must consider how all of the factors fit together at a cohesive level--one must use a global memory strategy, not an item-specific strategy. In Experiments 3 and 4, this tendency toward using global processing may account for the noted read effect, instead of the generation effect found in the first two experiments.

The possible use of a global processing strategy in Experiments 3 and 4 may also explain the difference in the types of confusions that were found. As previously mentioned, in Experiments 3 and 4, the subjects tended to make more read confusions (i.e., "thought" response to a complete word) than generate confusions. This pattern is the opposite as that found in Experiments 1 and 2. Global processing strategies, by definition, create a more comprehensive understanding of a whole set of stimuli, not an understanding of each factor (e.g., cognitive processing cues) associated with each single member of a set. Therefore, it makes intuitive sense that subjects should show greater overall confusions if they use the global strategy; and the results show that more confusions were made in the second set of experiments than in the first set of experiments.

The read confusions effect in Experiments 3 and 4 may also be explained by noting that some level of item-specific processing must have been used on the partial

word items so that the individual could successfully complete the fragment. That small amount of item-specific elaboration may have been enough to create some degree of cognitive manipulation or perceptual/contextual cue processing so that a more sensitive reality monitoring judgment could be made. The item-specific processing was not necessary for the complete words, so the reality monitoring decision was more difficult to make, hence, the greater number of confusions.

Thus, the recognition memory findings support the idea that subjects were actively participating in these experiments; they were not simply guessing during the testing phase. Additionally, because the recognition memory findings follow the patterns demonstrated by past research (e.g. Slamecka & Graf, 1978; Schmidt, 1990), I contend that the collected results reflect accurate and veridical research manipulations and procedures.

A number of possibilities exist as to why no reality monitoring effects for private and public self-consciousness were found in these experiments. First, it is possible that public or private disposition does not differentially affect how information is stored in memory. For example, private and public self-consciousness may not affect the degree to which one uses reflection when interpreting the social environment--at least not within the constraints of these memory experiments.

Second, private and public self-consciousness may affect reflection, but only with certain types of stimuli, such as personally relevant information or information that is directly associated with the type of personality that the individual possesses. For example, if a person has high private self-consciousness, then he or she may deeply reflect on only personally relevant private stimuli, such as personal beliefs,

personal attributes, or self-control issues (cf. Scheier & Carver, 1983; Nasby, 1989a; Turner, 1978). That individual may not deeply reflect on less "important" personal aspects of the social environment, and therefore may engage in the same level of cognitive processing as an individual with low private self-consciousness. Further discussion of the importance of self-relevance, in terms of possible research methodology limitations, will again be mentioned later in this section.

A third possibility is that subjects with low private or public self-consciousness may reflect just as deeply as high level subjects. The low scorers may, however, use the reflection result in a less noticeable manner. That is, they may reflect, or introspect, to the same degree as high self-consciousness subjects but not apply the result of their reflection directly to their own behavior. For example, the subject with low self-orientation may have a deep cognitive understanding of both sides of a personal issue, such as political liberalism, but not apply that knowledge to his or her own life. This outcome could be viewed as a lethargic, or non-motivated reaction to the topic; the individual knows about political liberalism, but he or she does not care enough about it to let it affect his or her behavior. If equal reflection is used for each type of subject (high vs. low), then memory differences between them may not necessarily be found, but behavioral (e.g., responses to questionnaires) differences may be noted, though these differences were not tested in the present studies.

As presented in the Introduction of this paper, Turner (1978) found a difference between high private and high public subjects in the speed at which they responded to different types of personality variables. The high privates responded more quickly to personal identity variables, while high publics responded more

quickly to social identity variables. This speed of processing difference can be considered an estimate of the degree to which a schema is articulated (Fiske & Taylor, 1984). For schemata to develop and become useful, one must create associations among various separate items that make up the domain of the schema category. For example, the domain of personal identity variables could include politeness as well as rudeness. Which of these personality variables one incorporates into his or her self-schema will be at least partly influenced by the degree to which the individual reflects on his or her past behavior. If the person tends to show more politeness than rudeness, then reflection should lead to the incorporation of the positive trait. To resolve Turner's findings, one must suppose that the high private and high public individuals have reflected on different stimuli (personal identity variables vs. social identity variables) when they were creating their self-schemata. So, simply stated, the knowledge each type of individual has is based on his or her past experiences, so the schemata of each type of individual are organized differently. It makes sense then, that if one has extensive knowledge about politeness, then it should be easier for him or her to activate the "politeness" memory node, and other associated nodes (e.g. courtesy, helpfulness), and therefore be able to more quickly respond to those same types of stimuli in the environment. Note, these articulated schemata are more likely to be personally relevant than non-articulated schemata. So again, the personal relevance factor may be important for invoking the use for private or public self-consciousness when interpreting one's surroundings.

Even though the research methodology appeared sound (because of the read/generate findings), a few changes in procedure may need to be made for future

research. For example, as it has been previously argued (in the Discussion for Experiments 1 and 2, and in the General Conclusions section), that self-relevant information is more likely to be remembered than non-self-relevant information. It may have been premature to disregard the use of self-relevant trait words in the methodology for the main experiments because the trait words may have created a confound in the pilot study. In the pilot study, self-awareness rather than self-consciousness was used for the perceptual orientation factor. Remember, self-awareness is a situational variable, and it was manipulated in the pilot study by the presence or absence of a mirror. The problem is that any other manipulation that affected self-awareness (e.g., the use of trait words as testing stimuli) could have confounded the mirror manipulation.

On the other hand, self-consciousness is dispositional, so it cannot be manipulated, and thus confounded by testing stimuli. As mentioned in the Introduction of this paper, the use of self-relevant trait words may create an *interaction* with the degree of private or public self-consciousness, but the dispositional self-orientation should not be confounded by the use of trait words. The benefit to using self-relevant trait words would be that the self-orientation of the individual would more likely be invoked by the subject when he or she is interpreting the target words.

Finally, in these studies, the samples that were used had very few subjects who scored in the extreme low ends of the public and private scales of the SCS. Subjects were chosen from upper and lower quartiles of the sample distribution, but many of our low scorers would not have made it into the lowest quartiles of Fenigstein's

population; that is, the "low" subjects in these samples scored too high to be effectively labeled "low public" or "low private" as defined by Fenigstein et al. (1975). Why the subjects did not score in the lowest extremes of the SCS is up to argument. Obvious possible explanations include the notion that the subjects were college students, where many social activities occur. This abundance of social experiences may have influenced the degree to which the subjects showed public forms of self-consciousness--they simply have learned to attend to the public cues that affect the public measure of the SCS. Additionally, the subjects were students in introductory-level psychology classes, where hopefully, they were learning about the role of the individual in society. This greater knowledge may have had the tendency to increase private self-consciousness.

Regardless of the cause, the distribution of the sample was skewed in the moderate to high scoring direction--which obviously limits the influence of truly low scoring private or public subjects. If the effect that self-consciousness has on cognitive processing is minimal, then it would be difficult to distinguish those effects with the current sample of subjects.

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Footnotes

[1]Analyses showed that there were no response differences by the subjects for List A and List B, so data from both Experiment 1 and Experiment 2 were collapsed across word lists.

[2]Analyses showed that there were no response differences by the subjects for List A and List B, so data from both Experiment 3 and Experiment 4 were collapsed across word lists.

Figure 1: Summary of the cognitive processing information and perceptual/contextual cues information for 2 levels of private self-consciousness (high vs. low) and 2 sources of memories (internal vs. external).

		Private self-consciousness	
		High	Low
Memory Source	External	High perceptual information Moderate cognitive processing	High perceptual information Low cognitive processing
	Internal	Low perceptual information High cognitive processing	Low perceptual information Moderate cognitive processing

Figure 2: Summary of the cognitive processing information and perceptual/contextual cues information for 2 levels of public self-consciousness (high vs. low) and 2 sources of memories (internal vs. external).

		Public self-consciousness	
		High	Low
Memory Source	External	High perceptual information Moderate cognitive processing	Moderate perceptual information Low cognitive processing
	Internal	Moderate perceptual information High cognitive processing	Low perceptual information Moderate cognitive processing

Table 1

Mean percentage of reality monitoring confusions for heard and generated non-trait words for two levels of private self-consciousness (Experiment 1).

	Level of Self-Consciousness	
Memory Source	High Private	Low Private
Heard Words	40.1%	32.2%
Generated Words	59.9%	67.8%

Table 2

Mean sensitivity scores (d') for recognition memory of heard and generated non-trait words for two levels of private self-consciousness (Experiment 1).

	Level of Self-Consciousness	
Memory Source	High Private	Low Private
Heard Words	2.07	2.04
Generated Words	2.67	2.96

Table 3

Mean percentage of reality monitoring confusions for heard and generated non-trait words for two levels of public self-consciousness (Experiment 2).

	Level of Self-Consciousness	
Memory Source	High Public	Low Public
Heard Words	39.4%	39.8%
Generated Words	60.6%	60.2%

Table 4

Mean sensitivity scores (d') for recognition memory of heard and generated non-trait words for two levels of public self-consciousness (Experiment 2).

	Level of Self-Consciousness	
Memory Source	High Public	Low Public
Heard Words	2.26	2.26
Generated Words	2.77	2.91

Table 5

Mean percentage of reality monitoring confusions for read and generated trait words for two levels of private self-consciousness (Experiment 3).

	Level of Self-Consciousness	
Memory Source	High Private	Low Private
Read Words	56.4%	53.1%
Generated Words	43.6%	46.9%

Table 6

Mean sensitivity scores (d') for recognition memory of read and generated trait words for two levels of private self-consciousness (Experiment 3).

	Level of Self-Consciousness	
Memory Source	High Private	Low Private
Read Words	3.41	3.26
Generated Words	2.61	2.91

Table 7

Mean percentage of reality monitoring confusions for read and generated trait words for two levels of public self-consciousness (Experiment 4).

	Level of Self-Consciousness	
Memory Source	High Public	Low Public
Read Words	58.8%	56.5%
Generated Words	41.2%	43.5%

Table 8

Mean sensitivity scores (d') for recognition memory of read and generated trait words for two levels of public self-consciousness (Experiment 4).

	Level of Self-Consciousness	
Memory Source	High Public	Low Public
Read Words	3.28	3.31
Generated Words	2.71	2.83

Appendix 1

Pilot Study

To test the relationship between high and low private self-awareness and reality monitoring, the following experiment was completed. Both the reality monitoring and the self-awareness manipulations that were used in this experiment have been used reliably in other studies (cf. reality monitoring: Johnson, 1988; Wippich, 1989; self-awareness: Wicklund & Duval, 1971). The specific hypothesis for this experiment was that individuals who were in a state of high private self-awareness would show fewer reality monitoring confusions than individuals who were in a state of low private self-awareness.

Method

Subjects

Subjects were 72 undergraduate college students from the University of Oklahoma. All of the subjects participated as a research familiarization requirement for their Introductory Psychology classes.

Materials

Trait words. A total of 30 trait words were used for constructing the testing stimuli. To reduce a possible materials confound, and to create stimulus lists of 20 traits each, the 30 trait words were randomly assigned to six groups of five words each (i.e., group a, b, c...). These groups were then arranged into clusters of four sets to form all possible combinations of the four group (20-item) test lists (e.g., set 1 consisted of groups a, b, c & d, set 2 consisted of groups a, b, c & e, etc.). Finally, 36 of the stimulus lists were randomly chosen for use in the study phase of the

experiment.

Stimulus lists. The stimulus lists that were presented to the subjects consisted of 20 randomly ordered items, and each item consisted of three components. The first component in each item was a descriptive statement of the trait word (e.g., I am usually cheerful and merry). The second component was a self-referent statement (e.g., I often feel happy). Note that the target trait word was always underlined in the self-referent statement as a means to draw attention to it. The third component was a 10-point Likert scale ranging from 1 (very true) to 10 (very untrue).

Reality monitoring manipulation. To test reality monitoring, during the test phase, one half of the trait words in the self-referent statement were written completely for the subject to read (e.g., embarrassed). The other half of the trait words were presented as fragments, with 2 or 3 letters being replaced by hyphens (e.g., emb-rr-ss-d). The order of complete and incomplete trait words was randomized to decrease the likelihood of a materials confound.

High versus low private self-awareness manipulation. For the high private awareness condition, subjects completed the experimental procedures while sitting in front of a mirror (13.5 inches x 49.5 inches) that was placed horizontally on the desk in their work station. The low private self-awareness condition had no mirror present in the testing room.

Distracter task. A 16-item demographic (e.g., age, grade point average) questionnaire and a 10-item self-esteem questionnaire (Rosenberg, 1965) were given to each subject between study and test phases of the experiment. The data collected from these materials were not used in subsequent analyses.

Test phase materials. The test phase materials consisted of the list of 30 traits. This trait list was comprised of the 20 traits that had been read or generated during the study phase (old traits), and 10 traits that had not been presented in the study phase (new traits).

Procedure

Subjects completed the experimental procedures individually. They were seated at a desk where the procedures of the experiment were explained to them. During the study phase, subjects were given the stimulus list and instructed to silently read the descriptive statement. Then, depending on the reality monitoring manipulation for each item, they either silently read the self-referent statement and the complete trait word, or they silently read the self-referent statement and generated the incomplete trait word. One subject was unable to generate one of the incomplete trait words, so the item was later dropped from subsequent analyses. After completing the self-referent statement, the subjects rated the degree to which the statement described their own personality, using the Likert scale. After completing all 20 items in this manner, the subjects completed the demographic questionnaire and the self-esteem survey.

During the test phase, the subjects were presented with the list of 30 traits. They were instructed to identify which traits they had read (i.e., seen as complete words), which traits they had generated (i.e., seen as incomplete words), and which traits they had neither read or generated (new words) during the study phase of the experiment. The subjects were debriefed after they completed the test phase.

These procedures were identical for high versus low self-awareness conditions,

except for the addition of a mirror on the back edge of the desk where the high self-aware subjects were completing the experiment. The mirror was removed for the low self-awareness condition. As an additional methodological consideration, the 36 subjects in the high self-awareness condition received identical word lists as the 36 subjects in the low self-awareness condition. This procedure was conducted to reduce the likelihood of a possible materials confound between the self-awareness conditions.

Results

The d prime (d') procedure was used to compare the distribution of hits (correct attributions of memory sources) to the distribution of false alarms (confusions) for the reality monitoring manipulation. The d' statistic is a measure of the ability to discriminate between signal (hit) and noise (false alarm) distributions, uncontaminated by response bias on the part of the subject. For the purpose of this study, a large d' signifies increased sensitivity or ability to identify the source of a memory, that is, an ability to accurately differentiate between internal and external sources for memories (cf. Durso et al., 1985).

Once d' values were computed for each subject, mean d' values were calculated and used as dependent measures in an independent t-test for the mirror/no mirror manipulation. No reliable sensitivity (d') differences were found between the mirror present group ($\underline{M}$ = 1.81) and mirror absent group ($\underline{M}$ = 1.44), $\underline{t}(70) = -1.4$, $p>.05$.

Discussion

Past research has shown the presence of a mirror to be a reliable manipulation to increase private self-focused attention (e.g., Nasby, 1989b; Wicklund & Duval, 1971), it is therefore surprising that the results of Experiment 1 showed no such effect.

However, the testing stimuli that were used in this experiment may offer a possible explanation for the null finding. Because the stimulus lists included self-referent statements pertaining to trait words, and because the subjects were instructed to rate their own expression of those trait words, then possibly the private self-awareness was situationally enhanced, regardless of the presence or absence of the mirror. By rating themselves on the degree to which they held the trait, the subjects were situationally induced to focus on the private aspects of their self--the mirror manipulation was confounded by the trait stimuli.

Appendix 2

Self-Consciousness Survey

Rate each of the following statements on the degree to which they describe your own behavior, using the following scale:
0--Extremely Uncharacteristic 1--Slightly Uncharacteristic 2--Neutral
3--Slightly Characteristic 4--Extremely Characteristic

_____ I'm always trying to figure myself out.
_____ I'm concerned about my style of doing things.
_____ It takes me time to overcome my shyness in new situations.
_____ Generally, I'm not very aware of myself.
_____ I'm concerned about the way I present myself.
_____ I have trouble working when someone is watching me.
_____ I reflect about myself a lot.
_____ I'm self-conscious about the way I look.
_____ I get embarrassed very easily.
_____ I'm often the subject of my own fantasies.
_____ I usually worry about making a good impression.
_____ I don't find it hard to talk to strangers.
_____ I never scrutinize myself.
_____ One of the last things I do before I leave my house is look in the mirror.
_____ I feel anxious when I speak in front of a group.
_____ I'm generally attentive to my inner feelings.
_____ I'm concerned about what other people think of me.
_____ Large groups make me nervous.
_____ I'm constantly examining my motives.
_____ I'm usually aware of my appearance.
_____ I sometimes have the feeling that I'm off somewhere watching myself.
_____ I'm alert to changes in my mood.
_____ I'm aware of the way my mind works when I work through a problem.

Appendix 3

A funny joke will make you laugh.

Sometimes it is fun to complete a crossword puzzle.

The opposite of up is down.

At the end of the month, I pay my landlord the rent.

Before the wedding, the groom's friends threw him a bachelor party.

At the movies I always buy a soda and a tub of popcorn.

Before I go to school, I comb my hair.

Beethoven composed classical music.

When the sun rises, the rooster crows.

He was the quarterback of the football team.

George Washington is the father of our country.

Fountain pens are filled with ink.

One old saying goes, "There is a pot of gold at the end of the rainbow".

I opened the window to let in some fresh air.

On the hand there are four fingers and a thumb.

For breakfast, I made scrambled eggs.

The opposite of hot is cold.

I shuffled the deck of cards.

The Marines are as American as apple pie.

Dairy cows give milk.

A collie is a type of dog.

Frozen water is called ice.

The dentist pulled the aching tooth.

I passed the salt and the pepper.

A robin is a type of bird.

A window is made of glass.

I cut my steak with a knife.

My car gets 25 miles to the gallon.

I made a peanut butter and jelly sandwich.

He put his cigarette out in the ashtray.

Appendix 3 continued

I put on my socks and shoes.

The opposite of yes is no.

She told him to "go fly a kite".

The opposite of north is south.

On my salad I had oil and vinegar.

The archer shot his bow and arrow.

My mother cooks in pots and pans.

A library has many books.

There are twelve months in one year.

A watch tells time.

His fiancee wore an engagement ring.

There are seven days in a week.

The opposite of left is right.

An elm is a kind of tree.

I saw the lightning and heard the thunder.

We gave the waitress a large tip.

There are nine planets in our solar system.

A trout is a type of fish.

Jack and Jill went up the hill.

To take a photo, you need film in the camera.

At fancy restaurants, it is a good idea to call ahead and make a reservation.

When in your car, it is a good idea to buckle your safety belt.

If it is cold outside, I always put gloves on my hands.

Tires are made of rubber.

At the fair, I like to eat cotton candy.

At the carnival, I rode the Ferris wheel.

She ordered a hamburger and french fries.

There are 60 seconds in one minute.

When I watch television in bed, I usually fall asleep.

My favorite pants are my faded blue jeans.

Appendix 4

Someone who is physically quick and nimble on his feet is agile.

People who frequently break rules and laws are bad.

Someone who is gracious and polite at parties is charming.

Someone who has a fascination with death and disease is morbid.

Someone with simple tastes or looks is plain.

Someone who is fairly bumbling in his physical and social activities is awkward.

People who are courageous and show little fear are brave.

People who keep their houses tidy and in order are clean.

People who are coarse and vulgar are rude.

People who are easily scared and have little courage are cowardly.

People who cheat and are dishonest are crooked.

Someone who is enthusiastic about starting some task is eager.

People who spend a lot of money on their friends are extravagant.

People who do silly things without thinking about them are foolish.

Someone who is kind and quiet in manner is gentle.

Someone who has strong desires to collect and hoard money is greedy.

Someone who is kind and merciful to other people and animals is humane.

Someone who is modest and shyly accepts complements is humble.

Someone who lacks the ability to complete a task is incompetent.

Someone who is reluctant to work is lazy.

Someone who is playful in a sly and teasing manner is mischievous.

People who comply to other peoples' demands are obedient.

Someone who shows a considerate regard for others is polite.

Someone who is mentally sound and healthy is sane.

Someone who is not very smart is stupid.

Someone who shows concern for others when they are hurt is sympathetic.

Someone who is different from everybody else is unique.

Someone who is always looking for ways to save money is thrifty.

People who often feel serene and peaceful are calm.

People who are polite to others are courteous.

Appendix 4 continued

Someone who always makes high grades in school is smart.

Someone who is very uncoordinated is clumsy.

People who often interrupt and disturb other people are disruptive.

People who easily form biases about individuals and groups are prejudiced.

People who are benevolent and giving are generous.

Someone who usually tries to do the right thing is good.

People who are usually tidy and neat are orderly.

Someone who is very intelligent is brilliant.

Someone who often loses interest in activities is easily bored.

People who rush into things without thinking about the consequences are hasty.

People who feel terrible when they do something humiliating are easily embarrassed.

Someone who tries to take it easy as often as possible is relaxed.

People who are mindful and considerate of others are thoughtful.

Someone who feels like other people are better than them often feel inferior.

People who are hesitant and unwilling to do many things are reluctant.

Someone who is usually physically and socially coordinated and refined is graceful.

People who are quick-witted and sharp are clever.

People who feel guilty after they have done something harmful feel ashamed.

People who are helpful and pleasant to others are nice.

Someone who is usually cheerful and merry is happy.

People who often make silly errors in school often feel dumb.

Someone who tends to disregard orders and instructions is disobedient.

People who often accomplish a lot in their jobs and/or schoolwork are productive.

Someone who is unwilling to give to charities is stingy.

Someone who is often anxious and jittery is nervous.

Someone who is disgusting or distasteful is repulsive.

Someone who is not strong is weak.

People who tend to be mean and insensitive are heartless.

Someone who is uncommonly vicious and mean is cruel

Someone who is fair to others is just