Effects of Objective Self Awareness on Reaction Times for Self-Descriptive Trait Terms

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Abstract

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The directing of attention toward internal aspects of the self was studied within the framework of Duval and Wicklund's (1972) theory of objective self-awareness. According to the theory, individuals who become aware of a discrepancy between their actual behaviour and ideal standards of behaviour are motivated to change their behaviours in order to reduce the discrepancy. Whereas objective self-awareness has been induced in participants by the presence of a mirror, no specific manipulations with regard to trait-specific judgments while being self-aware have been employed in prior-research. In the current study, participants were presented with trait terms either while looking at their own image in a mirror or looking at a blank screen. Participants were expected to make self-descriptive judgments faster when primed with a matching trait term and in a state of objective self-awareness than when they were not self-focused. Contrary to expectations, priming facilitated response times for self-descriptive judgments in the absence of a mirror, when participants were not self-focused. This was only true for women. Possible explanations for this pattern of results are discussed within the framework of objective self-awareness theory.

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Introduction

Research regarding the self has been booming and flourishing during the last few decades. Researchers interested in how people attend to and think about the self have made important strides in understanding different aspects and processes of the self such as self-esteem, attachment needs, (Baumeister and Leary, 1995), motivation, (Ryan and Deci, 2000) attention, regulation, and information processing (Rogers, Kuiper, and Kirker, 1977). The self has also been studied in terms of standards of behavior that the self is being compared to, as well as the way attention is being directed toward and away from it. This capacity to direct attention to the self as an object has been referred to by Duval and Wicklund (1972) as objective self-awareness. Their theory of objective self awareness has become one of the most influential modern theories regarding self-consciousness.

The theory differentiates between directing attention toward oneself or one's environment. According to the model, these two modes of directing attention are mutually exclusive. When an individual directs her attention inwards and focuses on herself she becomes the focal point of her attention, or in other words, the object of her own consciousness (Duval and Wicklund, 1972, p.2), and she is said to be in a state of objective self-awareness. Moreover, when people are made aware of themselves, their attention is momentarily turned towards a salient dimension of the self. Alternatively, a person can direct her attention toward salient aspects of the environment, in which case she is said to be in a state of subjective self-awareness. Although these two states are mutually exclusive, a person can be expected to oscillate and shift the focus of her attention spontaneously. If the state of objective self-awareness is induced through an

experimental manipulation, this state will not persist uninterrupted over long periods of time (Wicklund and Duval, 1971), but rather attention will oscillate according to the presence or absence of a self-focusing stimulus.

The goal of the present study is to explore how differences in objective self-awareness effect individuals' response times for traits describing the self. Particularly, it explores the effects of objective self-awareness on the ability to make rapid judgments about oneself. A typical procedure used in order to induce objective self-awareness is to have people see their own image in a mirror. For example, Duval and Wicklund (1973) had half of their participants sit in front of a mirror (mirror condition) whereas the other half did not (no mirror condition) and showed that objective self-awareness was increased in participants who were looking at their own image.

In the present study, I induced a state of objective self-awareness by the presence of a mirror. While participants were in that state, I directed their attention to a particular aspect of the self by the presentation of a trait term. I propose that if a trait term such as *clever* is presented to participants while they observe themselves in a mirror, the individuals' self-awareness vis-à-vis the salient trait *clever* will be enhanced. In other words, the presentation of the adjective *clever* will lead the participants' to making a judgment regarding how clever they think themselves to be, compared to some standard of cleverness. Furthermore, I predicted that such enhanced processing due to objective self-awareness would lead to faster response times for self-referent questions regarding salient trait terms. This would mean that individuals would respond faster to a question on how clever they are, after viewing the word *clever*. The hypothesized underlying process is as follows: when an individual sees a trait term a spontaneous judgment about

the self with regard to that adjective is made if she is self-focused. Making this judgment involves comparing an aspect of the self with some standard, made salient by the priming procedure. Subsequently, when the individual is asked to respond to a question that is related to that aspect of the self, the information is already available and accessible. This in turn accounts for faster reaction times in response to trait-relevant questions about the self vis-à-vis the trait. In contrast, I argue that such enhanced processing, and therefore faster reaction times, would not be expected to occur in the absence of objective self-awareness.

Background and Theoretical Issues in Self-Awareness Literature

The state of objective self-awareness was originally conceptualized as a trigger for self-standard comparisons. Self-awareness was thought to lead to an automatic comparison of self to what is socially acceptable (Duval and Wicklund, 1972, p. 3-4). According to the original theory, when individuals compare the actual self to an ideal self, and perceive that there is a discrepancy between the two, they will evaluate themselves negatively and experience negative affect. The ideal self corresponds to standards of correctness, which are mental representations of what a person should attain or how he should act. The person's self-evaluations can be along any one of a multitude of self-related characteristics or patterns of behavior. For example, if a person focuses on himself as a salsa dancer, while in a state of objective self-awareness, and he starts paying attention to his feet, he will evaluate himself according to the disparity between his movements, as he perceives them, and that of the ideal dancer he aspires to be. The greater the disparity, the more negative his self-evaluation, and the more negative affect

he will experience. Once such a discrepancy emerges, there are two courses of action available to an individual in order to ameliorate his affective state. The individual can attempt to change his behaviors and thoughts, if this is an attainable goal, or avoid the self-focusing stimuli if the goal is not attainable (Silvia and Duval, 2001). For example, Duval, Duval, and Mulilis (1992) showed that when individuals believe that their discrepancy from an experimental standard was mild, and their progress in a remedial task constant, participants worked on the remedial task. However, when participants thought that the discrepancy was substantial or that the rate of progress was low, they avoided the activity altogether. For the salsa dancer, the implication is that he may have to take additional classes and improve his routine, if he thinks that this is feasible, or avoid being self-aware while he dances by directing his attention toward his environment rather than himself. In this sense, objective self-awareness is a motivational theory since it explains the motivating factors that underlie behavioral change in response to states of self-awareness (Gibbons, 1990).

An additional issue addressed by objective self-awareness theory is attribution of causality to the self during states of self-awareness. According to the theory, an individual who is made to be self-aware will assume responsibility for external events more than a non self-focused individual. Duval and Wicklund (1973) induced self-awareness by the use of a mirror, and showed that regardless of whether the consequences of an event are good or bad, self-focused individuals will assume more responsibility and attribute the causes of events to themselves more than non self-focused individuals. In the study, the experimenters presented individuals in both mirror and no-mirror conditions with hypothetical situations. Half of the participants in each condition

were given hypothetical situations with positive outcomes, and the other participants were given hypothetical situations with negative outcomes. Participants were asked to imagine themselves in that situation and determine to what extent they or the other person in the situation would be responsible for the event in question. An example of a positive situation reads as follows (Duval and Wicklund, 1973, p. 26): "Imagine that you selected and purchased a race horse. You enter the horse in a major race and hire a good jockey to ride him. The horse wins first place. To what degree did your actions cause the victory and to what degree did the actions of the jockey cause the victory?" In both the positive and negative conditions, there was more self-attribution when participants faced a mirror than when they did not.

Revisions and Additions to the Original Theory of Self-Awareness

According to the original objective self-awareness theory, self-awareness is a transient state that can be elicited by a situation in which people are reminded of themselves, also referred to as a situational variable. Fenigstein, Scheier, and Buss (1975) challenged the view that objective self-awareness is determined solely by situational factors, and suggested that objective self-awareness can also be framed as a dispositional factor. According to these authors, some individuals tend to scrutinize their behaviors and mull over their thoughts extensively, whereas others remain oblivious to their own motives or how they appear to others. They referred to this stable personality trait as self-consciousness. In the current research, I am interested in the experimentally induced state of objective self-awareness and its effects on reaction times, and do not address dispositional aspects of self-awareness.

Even though in the current study I am not concerned with dispositional aspects of objective self-awareness, it is important to consider the issue of standards in this area, as it has implications for how people apply standards during experimental manipulations. In terms of dispositional self-awareness Fenigstein and colleagues (1975) suggested that there is a theoretical distinction between *public* and *private* self-consciousness. They argued that attention is not directed towards aspects of the self in general, but rather that attention consists of the specific orientation of the self toward the private or the public domain. According to this distinction, private self-consciousness refers to the tendency to be aware of internal states, such as thoughts, feelings, attitudes, and motives. In contrast, public self-awareness focuses on publicly displayed aspects of the self, and how others view the self. Fenigstein, Scheier, and Buss (1975) argued that these two tendencies are not only distinguishable, but also that they could be measured empirically as independent constructs. Indeed, items on the Self Consciousness Scale developed by Fenigstein and colleagues (1975) differentiate between private self-consciousness as reflected in statements such as "I'm generally attentive to my inner feelings" and public self-consciousness as reflected by items such as "I usually worry about making a good impression."

The two most commonly used experimental manipulations for inducing self-awareness have been mirrors (Carver & Scheier, 1978; Wicklund & Duval, 1971), and TV cameras. Researchers hypothesized that some experimental manipulations such as TV cameras (Davis & Brock, 1975) or the presence of an audience (Carver & Scheier, 1978) would enhance awareness to public standards, as they imply observation and evaluation by others. Conversely, manipulations that direct attention inwards, such as instructing

participants to write stories about themselves (Fenigstein & Levine, 1984), having participants listen to a tape recording of their own supposed heartbeat (Fenigstein and Carver, 1978), writing about the self, completing a self-report questionnaire (Froming, Nasby, and McManus, 1998), listening to one's recorded voice, or looking at oneself in a mirror, due to their private circumstances, would tend to elicit an awareness of private standards of the self (Carver and Scheier, 1981, p.50).

Davis and Brock, (1975) were amongst the earliest researchers that conducted a study to support the validity of mirror and TV camera use in the induction of self-awareness. They asked participants to choose English pronouns and match them with foreign language pronouns. They predicted that the presence of self-awareness inducing stimuli would lead to more choices of first-person pronouns. Their predictions were supported and participants who completed the task in the presence of a TV camera chose more first-person pronouns than those in the no camera condition. The results were obtained whether participants were given information about themselves or not prior to completing the task.

Carver and Scheier (1978, Experiment 1) produced similar results in an experiment in which a mirror was used as the self-focusing apparatus. In their study, participants were placed in individual cubicles and were given a sentence-completion task that measures egocentricity. A self-focused response expresses concern for oneself and little attention to the external world. For example, in completing the sentence "It's fun to daydream about:" a completion such as "my success" was scored as reflecting self-focus, and "giving a party for friends" as representing external-focus. Participants were assigned to complete this task in cubicles that either contained a mirror, or did not. As

expected, participants made a higher proportion of self-focused responses when placed in cubicles with a mirror. In a second experiment Carver and Scheier (1978; Experiment 2) showed that the presence of an audience could also be used to enhance self-awareness. In this study, the participants filled out the same egocentricity measure as before. For half of the participants a confederate experimenter was introduced as a graduate student who will observe them. This manipulation also resulted in a higher proportion of self-focused responses.

Some research has demonstrated that mirror manipulations have a distinct affect on self-awareness when compared to other types of manipulations such as the use of TV cameras. In a study that underscores this difference Scheier and Carver (1980b) induced self-focus via the presence of a mirror or the presence of a TV camera. Participants were asked to write counterattitudinal essays (i.e. that are opposed to their own beliefs) with regard to the amount of control students should have over the type of courses they take, while facing either a mirror or a TV camera. After writing the essay participants were also asked to report how much control they think students should have as well as rate how strong were the opinions they expressed in the essay. It was expected that students in the mirror condition would change their attitudes the least and report having written the weakest essays, while those students in the TV condition would change their attitudes the most, thus reporting having written the strongest essay. Results were consistent with the hypothesis. These results indicate that increased self-awareness was guided by self-relevant standards in the mirror condition, leading participants to act in a way that is match with their beliefs, while increased self-awareness was guided by social standards in the TV condition, leading to attitude change that confirms with public opinion.

Theoretical accounts for the observation that mirrors and TVs may both induce self-focus yet lead to different outcomes in terms of change of attitude and behavior, have moved away from the private-public distinction of self-awareness. Instead, it has been suggested that the distinction between public and public self consciousness is associated with a more general tendency to pay attention to standards endorsed by others versus standards endorsed by oneself, depending on the most salient standard of behavior in any given situation.

The complexity of multiple standards is especially evident when different standards that are in competition with one another are made salient simultaneously. For example, Froming, Walker, and Lopyan (1982) had participants face a mirror or be in the presence of two evaluative observers, while completing a task. Participants were asked to deliver electric shocks to a confederate researcher during a learning task. Such apparent punishment was contrary to their own beliefs, as assessed earlier, that physical punishment is an ineffective method for learning. The participants were chosen on the basis of their beliefs that a) punishment is an ineffective and inappropriate way to produce learning, and b) that most people believe the opposite, i.e. that punishment is appropriate and effective. The hypothesis was that subjects would either change their behavior or change their attitudes with regard to punishment, depending on the type of self-awareness manipulation they were exposed to. Results confirmed the hypothesis. Individuals in the mirror condition, who were thereby assumed to be more cognizant of their own standards of behavior regarding punishment, exhibited less aggression than individuals in the control group. In contrast, those individuals who were in the audience condition showed increased aggression, presumably as a result of being more aware of

what they believed to be publicly held standards of behavior. It can be argued that individuals in the audience condition attempted to comply with publicly held beliefs about the appropriateness of using punishment, and therefore acted more aggressively. The study has implications for the use of different types of manipulations, as such manipulations may increase the salience of different standards, and thus the aspects of the ideal self that are being accessed.

When in the presence of an audience, standards that relate to behavior in public or that represent social norms are more salient. Therefore, an individual is likely to act in accordance with these standards. When in the presence of a mirror, personal standards might become more salient, and therefore likely to lead the individual to act in accordance with internal standards and beliefs. However, the association between standards held by the self and the presence of a mirror can be disrupted if social standards become more salient. Gibbons and Wright (1983) showed that individuals responded to the salient standard of social norms by modifying their personal standards even while their attention was self-focused by means of a mirror. In other words, the authors demonstrated that conformity to a social standard could be achieved by means of what has been previously termed a "private manipulation."

It seems that a central question in discussing objective self-awareness is how individuals select salient standards for appropriate behavior, as a function of the situation they are in. In their study, Gibbons and Wright (1983) underscore the importance of taking into consideration the salience of different behavioral standards that may be represented by different environmental stimuli rather than viewing the means of achieving self-focus (i.e., mirror versus TV camera) as sufficient in eliciting different

types of awareness. It seems that experimenters often rely on their intuition when choosing specific manipulations of self-awareness. Some manipulations increase the salience of one standard over another, depending on the set-up of the experimental situation and the provided cues. In nearly all the research in this area, salient standards of behavior are not determined a priori, and independent confirmation of which standard is salient is not available. These are serious limitations when drawing conclusions about the effects of manipulations of objective self-awareness

The salience of different standards of behavior is central to the present study. Here I attempt to induce a spontaneous judgment about a self-relevant character trait that can facilitate responses on a subsequent self-descriptive task. I have chosen a mirror as the self-focusing manipulation, as it was previously shown to trigger a comparison of the self with private standards of behavior. However, caution must be taken when interpreting results of the current study, as salient standards of behavior have not been clearly assessed a priori. In a sense it shares this limitation with earlier antecedents.

Self-Focus and Accessing Information about the Self

Researchers have expanded on the original theory of objective self-awareness by addressing the cognitive processes that underlie discrepancy reduction between the actual and the real self. Carver and Scheier (1981) were interested in the cognitive aspects that underlie discrepancy reduction and reassessed the concept of personal standards. They also considered the concept of cognitive representations of the self or self-schemas, as they apply to self-awareness. More specifically, they argued that the process of focusing

attention internally upon the self helps to accesses the self-schema, leading to faster encoding and retrieval of self-relevant information.

Self-schemas were previously studied in relation to information processing regarding the self, (Rogers, Kuiper and Kirker, 1977) and in relation to cognitive organization of self-referent information and subsequent performance on a variety of self-related cognitive tasks (Markus, 1977). The self appears to be a schema that is involved in processing and interpreting information according to previously acquired experience and knowledge.

One way that self-referent processing has been studied has been within the "depth of processing paradigm." This paradigm was used to test participants' ability to recall or recognize items as a function of the depth of processing involved at the time of encoding this information. Depth of processing refers to degree of semantic processing (Craik and Tulving, 1975) where a semantically rich task such as comparing words according to similarity in meaning is considered 'deep,' whereas a task requiring participants to focus on the structure of a word's font (structural) is considered 'shallower'. Building on this recall paradigm, Rogers et al. (1977) asked participants to process lists of words in terms of how they related to the self (self-referent), the meaning of these words (semantic), the font words were written in (structural), as well as their rhyming (phonetic). Participants' recall of the words was best when words were processed at the self-referent level. Rogers et al. (1977) concluded that processing information in a self-referent manner is a powerful encoding strategy, and that the self-schema plays an important role in the organization of self-relevant information. This view, however, has been challenged by research showing that the exclusive superiority of self-referent encoding in producing

better recall is due to the organizational function of the self-schema rather than due to the unique effects of the self-concept. According to Klein and Kihlstrom (1986), it is the organization of material that is responsible for improved recall. The self-schema provides a basis for categorization of self-relevant information, but other non self-referent semantic tasks can facilitate recall to an equal degree, given that that they are equal in terms of the amount of organization they encourage.

While the centrality of the self-schema for different processes may be debated, research has clearly documented a number of ways in which self-schema influences information processing. Rogers, Rogers, and Kuiper (1977, b) provided evidence for the existence of a general self-schema by showing that participants erroneously recognized items that were never presented to them as having been viewed before, when these items were rated as self-descriptive. In this study, Rogers and his colleagues (1977, b) suggested that the items that were presented to participants during the acquisition stage of the experiment elicited the activation of a general superordinate self-schema. When, at a later time, participants were asked to recognize whether adjectives were previously viewed, participants had access to additional adjectives that were part of the self-schema and falsely recalled them as having been presented previously.

Support for the view that objective self-awareness increases self-referent thinking and self-evaluation was provided in an earlier study by Geller and Shaver (1975) using a modified version of the Stroop color-word task. According to previous research, it can be argued that when a word that is semantically related to a recently accessed schema is presented on the Stroop task, response latencies for naming the color in which that word is printed are longer (Warren, 1972, 1974). Geller and Shaver (1975, Experiment 2)

induced a state of self-awareness in their participants by exposing them to a TV camera or a mirror, and were presented with self-relevant and neutral terms. The words that were chosen as self-relevant were general people-relevant words such as careful, awkward, fumbling, or competent. It was assumed that such words are likely to be self-evaluative for almost everyone, but the self-relevancy of words for each participant was not identified. Participants who were seated in front of a mirror or camera displayed longer latencies for self-descriptive trait terms but not for neutral traits. This suggests that the self-awareness manipulation activated self-relevant thinking. The presence of a mirror or TV camera led to preoccupation with the self and activation of thinking about self-descriptive trait terms, so that thinking about these trait terms interfered with the color-naming task. One limitation of this study is that the self-evaluative terms may have been more distracting because they are people-related rather than self-related. An alternative account for the results of this study could be that the trait terms presented led participants to engage in spontaneous comparisons or evaluations of self with ideal standards suggested by the cue words. Such judgments could interfere with the color-naming task.

Results from studies by Carver and Scheier (1978), discussed earlier, can also be interpreted as evidence for the view that situational objective self-awareness increases the availability of the self-schema. In these studies, participants were asked to fill out a sentence-completion blank under conditions of low and high self-awareness. Participants made more responses involving the self when their self-attention was high. One possible explanation for this pattern is to assume that responses are a function of the accessibility of self-schemas. In the study the accessibility of self-schemas was increased by directing

attention to the self, making it relatively easier for participants to draw on these schemas and provide information about the self.

While the previous studies point to the influence of situational factors on access to self-relevant information or self-schemas, other studies have also explored the ease of access to self-schema as a function of individual differences in dispositional self-consciousness. One such study conducted by Turner (1978) asked individuals, who were classified as being either low or high in private self-consciousness according to the Self Consciousness Scale, to describe themselves. Participants were asked to list in an open ended format adjectives or traits that describe them best. Those participants who were dispositionally higher in self-consciousness provided more elaborate descriptions of themselves, using more descriptive adjectives or phrases. Turner concluded that self-conscious individuals had more knowledge about oneself available to them leading to more elaborate self-descriptions.

These results should be interpreted with caution as research has pointed to some fundamental problems in using the Self-Consciousness Scale (Fenigstein et al., 1975). First, the original distinction between private and public self-consciousness seems to represent one of many possible classifications of goals and values represented in the scale, rather than reflect distinct types of dispositional self-consciousness (Carver and Scheier, 1985). Second, the Self Consciousness Scale does not distinguish between rumination and reflection. Trapnell and Campbell (1999) differentiate between ruminative and reflective self-focus and argue that they represent separate constructs within Fenigstein's et al. (1975) original Self-Consciousness Scale. According to this distinction rumination is a chronic past-oriented type of self-focus associated with anger,

depression and anxiety, whereas reflectiveness is a type of self-attentiveness associated with positive motives such as curiosity and openness to new experiences. Finally, self-reflectiveness and internal state awareness have also been identified as two distinct, yet related, components of the Self-Consciousness Scale (Mittal & Balasubramanian, 1987). According to this distinction self-reflectiveness expresses attempts at better understanding and analyzing one's own thoughts and feelings, whereas internal state awareness refers to being aware and sensitive to one's feelings and thoughts. There is no simple linear relation between the constructs of rumination, reflection, self-reflectiveness and internal state awareness. Thus interpretation of results obtained by using the Self Consciousness Scale remains problematic.

Generally, research supports the idea that at least some types of self-attention may activate self-relevant schemas. Alternatively, self-awareness may trigger a process of self-evaluative thinking or comparing of the self to a salient standard. Self-relevant information becomes available as a result of this process and can be accessed with relative ease facilitating responses for questions that require self-knowledge, or interfering with process that require attention to cues outside the self.

Self-schema and attention to specific aspects of self

While the previous findings have been interpreted in terms of activation of a self-schema as a result of induced self-awareness, the manipulations used to induce self-awareness have often been rather general. Furthermore the self-schema has been used this far in a rather loose broad sense to refer to a general abstract cognitive representation of the self that includes memories and past experiences as well as personal data (Rogers et

al., 1977). There is no evidence for what the schema is and the concept of self-schema as it has been used this far can be equated to the self or a vague sense of who a person thinks she is or how she perceives herself. This representation may include general character traits such as sensitive, intelligent, and friendly as well as more situation-specific aspects of the self and characteristic behaviors. Manipulations of self-awareness have been equally broad, serving as reminders of the self in general, without directing attention to a specific aspect of the self.

An assumption made by researchers is that attention drifts naturally between the self and the environment, and that a person's focus will naturally shift to the aspect of the self that is most relevant in any situation (Carver & Scheier, 1981, p. 42). For example, for a novice salsa dancer the focus may shift to his feet as he is still trying to master the steps, because his own movements are the most salient aspect of his experience. In contrast, a more experienced dancer may feel comfortable about his dancing skills, and focus on his ability to carry on a conversation with his dance partner who is also his date for that evening. The focus to different aspects of the self such as conversational skills, versus movement or motor mastery will be guided by the salience of these features in any given situation.

Why should any aspect of the self or the environment be more salient than others? Carver and Scheier (1981, p. 42) explain that the continuous shifting of attention is guided partially by the cues that are conveyed by specific objects in the environment. In other words, the attention directed toward the self will focus on an aspect of the self that has been suggested by a cue in the environmental context. This is inversely parallel to the process by which attention to specific environmental cues is guided by internal ones. If

the environmental cue was related to an anger arousing event, then the self-focused individual may direct her attention to aspects of the self associated with emotion, whereas if the environmental cue was related to academic achievement she may focus on aspects of the self that are associated with specific cognitive abilities.

For example, if a person is in a state of self-awareness as a result of looking in a mirror and soon after while reading the paper, comes across an article discussing environmental issues, he may become conscious of his own behavior regarding recycling. He may become conscious of his use of Styrofoam cups or his vegetarian diet and compare it to some standard of environmentalism. The same self-focused individual may become conscious of a pain in his foot if a pharmaceutical advertisement catches his gaze while in a state of objective self-awareness. In such case he may become aware of his aches and physical state and become aware of how he meets some standard of health and well-being. Thus, Carver and Scheier (1981, p. 43) conclude that the use of a mirror can direct attention toward how the self meets certain standards of behavior, depending on the environmental cues provided by the experimental situation. This is explained by the assumption that the cue triggers the relevant cognitive structures, which are then ready and accessible for focus.

In contrast to the rather vague understanding of the concept of self-schema employed in objective self-awareness research, a more focused definition of self-schema has been suggested by Markus (1977). According to this definition self-schemas are cognitive representations for a specific character trait or a pattern of behavior derived from repeated experiences and behaviors in that domain. Some self-schemas may be more or less developed than others. This view of self-schema differs from the broader

meaning it has received within the area of objective self-awareness because it refers to the organization of self-relevant knowledge in terms of specific topics or character traits. For example, an individual may possess a self-schema related to assertive behavior based on specific events such as "Yesterday I told my friend that her being thirty minutes late is entirely unacceptable," as well as more general representations of oneself such as "I am talkative," or "I usually get my message across easily". Different individuals may have developed articulated and elaborate self-schemas for different ways of behaving, depending on their experiences. Once a self-schema for a particular trait has been established it plays a role in attending to new self-related information, and processing it.

Markus (1977) predicted that individuals with developed self schemas in certain areas should be able to process information about the self in the given domain faster, to retrieve more behavioral evidence from that domain, and to predict engaging in schema-consistent behavior in that domain, in the future. She also predicted that individuals with self schemas in a specific domain would act in congruence with their self-descriptions, more so than those who do not have such schemas. To test these predictions she identified individuals who possess a self-schema on a specific dimension (dependence-independence) and compared their performances with that of individuals who do not posses such a schema (aschematics) on a variety of cognitive tests. She measured response latency for schema-specific words in dependent, independent and aschematic participants.

Results showed that individuals who think of themselves as independent, have faster processing times for independent words, whereas participants who described themselves as dependent, took significantly longer to make these judgments. In contrast

aschematics showed no differential response latencies for schema-related adjectives whether these were dependent or independent words. Based on this pattern of results, Markus concluded that faster processing times for certain words are indicative of the presence of specific schemas which contain information about that domain (e.g. individualism and independence), whereas a lack of such schemas is reflected in relatively longer reaction times. In other words, the presence or absence of a schema about a style of behavior impacts the processing of information regarding that behavior.

In general, the organization of the self differs from person to person so that in any specific area some persons will have more comprehensive schemas than others. This suggests that such schemas are at least to some degree independent from one another, within each person's self-construct, and that specific conditions may lead to accessing different aspects of the self. Among her concluding remarks Markus (1977) notes that not all individuals have a subjective self-representation on every dimension of behavior.

Implications of objective self-awareness for attitude and behavior change

Objective self-awareness is closely associated with the regulation of behavior and motivation. Objective self-awareness was originally conceptualized as a motivational state, thus implying that it could lead individuals to change their behaviors or their attitudes in order to meet a personal standard and reduce a discrepancy between personal standards and current behavior. The effects of objective self-awareness on behavioral and attitude change have been tested in various contexts. Studies have shown that in the absence of self-focus, such as when attention is directed externally, motivation to reduce internal discrepancies between the actual and the ideal self is significantly lower. This

trend seems to suggest that the disparity between the actual and ideal self is not as disconcerting when attention is directed outwardly, but it's disconcerting effects are enhanced by self-focus.

The extensive effect of self-focused attention on attitude change was demonstrated in a classic study by Insko, Worchel, Songer and Arnold, (1973). In this study, participants engaged in attitude change to a significantly lesser extent when their attention was not self-focused via the presence of a camera. Men and women were asked to write a counterattitudinal essay regarding the legalization of LSD, after participating in a high- or low-effort exercise task. Some of the participants had a choice as to the amount of effort they would have to engage in during the exercise task, and self-awareness was manipulated through the absence or presence of a TV camera. Women, but not men, showed significant changes in their attitudes towards the legalization of LSD, when in the presence of a camera and when they had a choice with regard to the amount of effort exerted. The authors explained these findings as evidence of objective self-awareness in the presence of a TV camera, leading those women who were engaging in a behavior that violated their self-concept, (i.e. high effort exercise activity, which they found aversive) to change their attitudes also.

Conversely, in a situation where a change in attitude or behavior is not an option individuals seek to avoid self-focused attention. Greenberg and Musham (1981) found that participants who were forced to engage in counterattitudinal behavior were more likely to try to avoid a state of self-focus than individuals who were engaged in behavior that was consistent with their attitudes. In their study, male and female undergraduate students read statements about their attitudes toward women that were either consistent or

inconsistent with their actual attitudes and were given the possibility to face a mirror or a non-reflective wall. They found that individuals who were forced to read statements that were incongruent with their attitudes avoided the self-focusing stimulus, whereas those who behaved in accordance with their attitudes sought-out the self-focused state. The authors concluded that self-focused attention could be a positive experience when there is a salient positive feature of the self that can be magnified through this state.

Aggression has been at the centre of much research on self-focused attention and behavioral change. Scheier Carver, and Gibbons (1974) induced self-awareness and showed that this state led to reduced aggressive behavior in men. In this study the general behavioral standard of "chivalry" (that men are not commonly aggressive to women) was assumed to be a well-internalized standard relevant to the experimental situation. Men participating in the experiment were led to believe that they were teaching a concept to a woman co-participant, who was actually a confederate, using electric shocks as punishments. Scheier et al. (1974) predicted that individuals who were made self-aware would become more sensitive to their standards of non-aggressive behavior toward women and act to reduce the discrepancy between their behavior and their standards of chivalry. As expected, individuals who were made self-aware either by the presence of a mirror or by the presence of additional observers, used decreased levels of aggression in their punishments compared to the control group. Although self-awareness was associated with reduced aggression, there is no independent confirmation that chivalry was in fact the standard that was used by participants in order to regulate their behavior.

The authors noted that the experiment does not suggest that self-awareness reduces aggression in general, but rather that it affects behavior so that it becomes more

matched with desirable standards. However, standard salience may change from situation to situation as noted earlier. To demonstrate this point Carver (1974) reversed the regulation of behavior in an opposite direction from less to more aggressive. In this study high levels of aggression were made into a desirable standard of behavior. Participants in the mirror-induced self-attention group delivered more intense electric shocks in order to confirm with the experimentally induced new standard of behavior.

Helping behavior and self-focus is another area of interest with important implications for social psychology. Increased self-focus, in some circumstances, may have important effects on social behaviors such as helping others in need (Wegner and Schafer, 1978). Research has shown that this effect is more likely when the request for help is salient (Rogers, Miller, Mayer, & Duval, 1982), or when the standard for helping behavior is salient (Gibbons & Wicklund, 1982). Mayer, Duval, Holtz, and Bowman (1985) asked participants to help in distributing pamphlets. Levels of self-focus varied among participants and the salience of the request for help was manipulated by emphasizing and capitalizing those sentences that ask participants for help. Individuals' felt responsibility was also manipulated by telling some participants that they have a very rare personal characteristic that makes them more likely to help.

Participants that were more self-focused and felt a greater personal responsibility were more willing to help with the distribution of pamphlets. The authors concluded that when individuals are self-focused and under certain circumstances, such as when they feel more responsible for the welfare of others, they are more willing to help. Salience of the request for help is one factor that can increase felt responsibility in self-focused individuals and lead to helping behaviors.

Research has shown that self-awareness and activation of trait-specific self-schemas (Markus, 1977) can lead to changes in helping and pro-social behaviors, not only in adults, but in children as well. Froming, Nasby, and McManus (1998) measured the presence of communion- and agency- domain specific self-schemas by asking children whether a word described them or not, and asking them to recall these adjectives at a later time. Children in the experimental group were made self-aware by completing an abbreviated version of the California Q-sort for children (Block & Block, 1979), a self-report questionnaire. After completing several tasks, all children were given an opportunity to donate some of the tokens they received as remuneration for their participation in the experiment. Following this, the experimenters asked the children whether different prosocial and agentic adjectives described them in order to assess children's schemas for agency and communion. Results indicated that boys but not girls who were self-aware and who had a communion pro-social schema donated more tokens. The authors concluded that the boys regulated their behavior using their prosocial schemas, when they were made self-aware. They inferred that the donating behavior was a result of the boys' self-awareness and the activation of their domain-specific schema of helping behavior and being nice.

Finally, self-focused attention has been studied in the context of its effects on honesty and accuracy in participants' self-reports. In an innovative study by Gibbons (1983), incarcerated women who had particularly high scores on the lying scale of the MMPI were asked to provide reports about themselves on a variety of topics. These reports were compared to those of a group of incarcerated women who scored below the average on the lying scale. The validity and truthfulness of all reports were examined by

comparing them with prison records and evaluations. The inaccuracy of reports of the low-liar group who were not exposed to a mirror was similar to that of the high-liar group, whereas the presence of a mirror substantially increased the accuracy of reports of the low-liar group although it did not affect those of the high-liar group. These results suggest that directing attention to the self reduces the occurrence of lying and dishonesty in participants who maintain personal standards of honesty.

Taken together, these studies provide further support for the idea that when certain standards of behavior become salient or trait-specific self-schemas become activated they can affect a wide range of behaviors such as aggression, helping behaviors, or honest reporting. It also seems to support the idea that external or internal representations of standards become instrumental in effecting behavior, when individuals are objectively self-aware.

Implications of Objective Self Awareness on affective states and clinical syndromes

The impact of self-awareness on affect and emotional states is an additional theoretical extension of the original model of objective self-awareness that has received substantial attention and confirmation. To the extent that emotional states become salient, objective self-awareness may serve to amplify emotional responsivity. According to Carver and Scheier (1981) negative affect is not always the result of the evaluative process triggered by self-awareness. Rather, both existing positive and negative emotions may be amplified as a result of the self-evaluative process. Although Carver and Scheier (1981) do not identify, in their book, the mechanisms by which self-focused attention

impacts affect one possible hypothesis is as follows: when people who are in a negative state become self-aware, they evaluate themselves more negatively. This negative self-evaluation contributes to their negative affect leading to a vicious cycle of increasingly negative self-evaluations and depressed mood. A similar mechanism may operate with individuals who are in a positive state. Such persons will presumably evaluate themselves in a more positive light and feel that they are performing up to par or better than a given standard. This evaluation will, in turn, contribute to an increase in positive affect. In practice, most studies conducted have only been able to show increases in negative affect as a result of self-focusing. The issue of whether positive emotional states can also be amplified by objective self-awareness remains unresolved.

Findings point to the intensifying effect of self-focused attention in individuals whose negative emotions are already salient. For example, Gibbons et al. (1985) showed that individuals who suffer from affective disorders report increased negative affect on a shortened version of the State-Trait Anxiety Inventory when they are exposed to a mirror, whereas a control group of recovering alcoholic inpatients do not exhibit increased distress. The same researchers found similar patterns of results when the depression, anxiety, and hostility scales of the Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1965) were used as a measure of affect. Depressive, anxious, and hostile affect was exacerbated by self-focus for depressed inpatients but not for patients in the control group. Both experiments underscore the link between self-focused attention and increased negative affect in individuals already experiencing negative affect.

Due to the relation between negative emotions and objective self-awareness, some theorists have suggested that depressed individuals chronically exhibit self-focused

attention. It seems that depressed individuals, relative to healthy ones, spend more time focusing on themselves. There appears to be a relation between depression ratings, as measured by the Beck Depression Inventory, and high ratings on the self-consciousness scale (Ingram and Smith, 1984). These results have been replicated in several other studies with depressed and non-depressed participants (Smith, Ingram and Roth, 1985; Larsen and Cowan, 1988).

The association between negative affect and self-focused attention may also vary according to individuals' predispositions to experience negative affect and individual differences in the effects exerted on them by self-focused attention. For example, Greenberg and Pyszczynski (1986) found that depressed individuals might experience more prolonged states of self-focus following a negative event. They showed that depressed participants preferred a self-focusing task after an experience of failure, whereas non-depressed individuals preferred the self-focusing task after an experience of success and avoided it after failure. In a follow-up study, they showed that although both depressed and non-depressed participants evidence elevated levels of self-focused attention following failure, depressed individuals retain these higher levels for a prolonged period of time in comparison to non-depressed individuals. Thus, self-focused attention may play an important role in the maintenance of negative emotions, once these are set in motion.

In a review article, Ingram (1990) considered the presence of self-focused attention in a range of clinical disorders. He argued that a state of heightened self-focused attention is common to many disorders and therefore might play an important role in psychopathology. Mor and Winquist (2002) synthesized 226 effect sizes in a meta-

analysis and came to similar conclusions, suggesting that overall self-focus is associated with negative affect. Particularly, they concluded that private self-focus was more strongly associated with both depression and generalized anxiety, and public self-focus was more strongly associated with social anxiety.

Ingram (1990) substantiated his argument by providing experimental evidence that a stable relation exists between depression and private self-consciousness. Similarly, he showed that anxiety states are also associated with an increased focus on the self rather than the task at hand. A similar process seems to be relevant to test anxiety, in which attention to the self may detract from attention to the task and impair performance on the task. Self-focused attention has also been implicated in social and generalized anxiety; however, the high comorbidity between anxiety and depression makes it difficult to attribute self-attention as a unique factor in either one of these two conditions. Other psychopathological conditions such as alcohol dependence, schizophrenia, and psychopathy have also been investigated in the context of self-focused attention.

Although Ingram was able to identify self-focus as a common feature of various pathological conditions, the usefulness of this finding remains controversial. Pyszczynski, Greenberg, Hamilton, and Nix (1991) agree with Ingram's (1990) claim that self-focus is common to many of those who suffer from psychopathology, but criticize some of his conclusions regarding the utility of this concept given its ubiquity in so many conditions. Instead, they argue that self-focus plays an important role in self-regulation, which is indeed common to many disorders, but that models accounting for different disorders offer differential accounts about the ways in which self-focus interacts with other factors to create the specific dysfunctional behavior.

Closely related to the relation of self-awareness and negative affect is the relation between self-awareness and reflection and rumination in daily life. Nezlek (2002) investigated the causal relationship between daily negative events and self-focus. For three weeks, participants provided daily reports of their private and public self-consciousness, completed measures of anxiety, and described the events that occurred each day. Nezlek (2002) predicted that people would be more anxious on days when they were more self-conscious, and that they would become more self-aware on days on which negative events happened. The relation between daily events, self-consciousness, and mood-states was analyzed within a day-to-day framework. Such an analysis allowed Nezlek (2002) to establish how events and emotions were changing from day to day, causing and affecting one another for each individual separately, as well as to identify differences between individuals. Results suggest that anxiety leads to private self-consciousness and may act as a predisposing factor but the direction of this relation is not reversible. Contrary to the general pattern observed in previous research, results showed that neither public nor private self-consciousness covaried with depressive symptoms. Instead, the relation between negative affect and self-focused attention in this case was specific to anxiety. Nezleck (2002) found that individuals reported having experienced more negative social events on days on which they were more self-conscious, leading him to conclude that self-consciousness may be a predisposing factor for experiencing negative events. The study highlights the causal relationship between self-awareness and external events, as well as emotional internal states.

One possible explanation for the contradictory results obtained by different researchers may be related to the different sub-scales that are nested within the Self

Consciousness Scale. Most research fails to distinguish between what seem to be distinctive styles of self-consciousness. Differentiating between these styles could resolve some questions regarding the role of self-focused attention in different clinical syndromes. Conway, Giannopoulos, Csank, and Mendelson (1993) have argued that only particular types of self-focus may be characteristic of depressed individuals. They found that more dysphoric participants report being more self-reflective, but do not report being more aware of internal states. Self-reflectiveness and internal state awareness are both represented on the Self Consciousness Scale by items such as "I'm always trying to figure myself out" for the former, and "I'm generally attentive to my inner feelings" for the latter. Self-reflectiveness refers to questioning and being uncertain about one's thoughts and feelings, whereas internal state awareness refers to an introspective awareness of such thoughts and emotions. Based on correlations between individuals' scores on measures of self-reflectiveness and internal state awareness, and measures of depression Conway et al., (1993) concluded that individuals who experience dysphoric moods might persist in engaging in self-reflection precisely because they lack an understanding of their own emotional states.

More recent studies have focused on the mechanism by which objective self-awareness may contribute to negative emotions. One possibility, according to Self-Discrepancy theory (SD; Higgins, 1987) is that differences between actual and ideal selves cause sadness and depression, and differences between actual and ought selves lead to agitation and anxiety. Philips and Silvia (2005) have shown that self-awareness increases the accessibility to the disparity between actual and ideal selves, and between actual and ought selves, and plays an important role in maintaining negative emotions as

a result of the evaluative process. In other words, the authors argued that self-awareness might not in itself generate negative emotions, but rather that it plays a role in maintaining and amplifying these emotions, once discrepancies between the real and ideal self are perceived.

Present Research: self-awareness and response time latencies

The present research is based on objective self-awareness theory, and on the premise that in such a state individuals are motivated to compare themselves to some available standard. The use of a mirror in combination with a priming trait word is assumed to elicit a state of self-awareness. Furthermore, it is assumed that standards for comparison could be suggested to individuals via priming a procedure. This in turn, would elicit a spontaneous judgment or evaluation of the self vis-à-vis that standard. Subsequently, information about the self in terms of the specific character trait in question would become accessible. As a result, the ability to provide self-relevant information with regard to the specific character trait would become enhanced and response latencies for self-referent questions shorter.

In the current study, self-awareness was induced by the presence of a mirror. Mirrors have been used successfully in previous studies and were shown to have consistent effects in terms of inducing self-awareness. Since a mirror evokes only a general schematic representation of the self I have used an additional cue, a priming adjective, in order to provide an external standard for comparison and focus the participants' attention to specific aspects of the ideal self. Priming as a general concept refers to the increased availability of information resulting from exposure to specific stimuli or events (Higgins, Rholes, & Jones, 1977). For example, medical students in

their first year often experience the "medical student syndrome" wherein they worry excessively over the possibility of having many serious illnesses. This is believed to be a classic example of priming effects, where the daily exposure to physical syndromes in their studies increases the availability of this information, which is then used to interpret normal physical symptoms. Priming can occur even when individuals are not consciously aware of the priming stimuli.

In the current study an adjective was presented as a priming cue followed by a semantic task in which participants reported how well the trait term describes their personality. For example, the word *clever* was presented in order to initiate a comparison to some standard of cleverness, rendering the participant's self-knowledge with regard to his or her own intelligence more accessible. Following this, a question related to the participant's cleverness was presented, and reaction times for the response were recorded. I predicted that in cases where individuals were made self-aware and cognizant of a particular aspect of their personality, reaction times on a subsequent question would be shorter.

In this study reaction times for self-relevant questions were used as a measure of the accessibility of self-evaluative information about ways of behaving and character traits. This procedure is rooted in an older paradigm repeatedly used by Klein (Klein and Loftus, 1993; Klein, Loftus, and Burton1989; Klein, Loftus, Trafton and Fuhrman, 1992) in studies exploring the nature of semantic and autobiographical memory. In these studies two consecutive tasks are presented in such way that the initial task may facilitate the response on the second task. All variants of Klein's priming paradigm follow a common rationale: given two consecutive tasks performed by a participant, if the information

relevant to the second task is made available during the first task, then the time required to perform the second task is shorter than if the relevant information was not available. The authors used this technique in order to compare performance on an autobiographical task with performance on a self-descriptive task and a semantic task.

The idea that performance on a certain task renders specific information available for a subsequent task, thus reducing the response time on the latter task, can be postulated to work with spontaneous judgments of self elicited by a comparison to a standard. In the latter case, spontaneous judgments about self relevant trait terms, should lead to shorter response times on a subsequent question that draw on the self-evaluative information. Klein's priming paradigm was never used in the context of objective self-awareness. It is the scope of the current study to draw on two methodological approaches namely priming and mirror induced self-awareness in order to understand the effects of self-awareness on reaction times for self-descriptive trait terms.

Hypotheses

Participants' reaction times for judging trait terms were explored in this study. There were two hypotheses. The first hypothesis was that individuals would be fastest when responding to questions about the self while being objectively self aware and presented with a matching priming trait term (i.e. the priming word is the same as the word featured in the self-referent question.) The second hypothesis was that participants would be slowest when responding to questions about the self, when in a state of objective self-awareness and presented with a mismatched priming trait term.

To address these hypotheses, participants completed a computer task. During the task, an initial trait term (i.e. the primer) was presented followed by a question about how well does a trait term (i.e. the target) describes oneself or one's acquaintance. Judgments about an acquaintance served as a control condition and it was expected that latencies for these types of judgments would be overall longer. In some of the trials the primer term was the same as the target term (matching condition), and in others it was not (mismatched condition). The self-referent questions were presented to individuals half of the time while in a state of objective self-awareness created by the participant's reflection in a two-way mirror.

I hypothesised that when a person becomes self-aware due to the presence of a mirror, and is presented with a specific trait term, a self-standard comparison for that adjective ensues and facilitates response to a subsequent question regarding how well the trait describes oneself. This facilitation leads to faster reaction times. Conversely, when participants provide information about a trait term that does not match the priming trait I expected that the self-evaluative information resulting from a comparison with the standard suggested by the primer would interfere with responses about a different trait term, thus resulting in slower reaction times.

Method

Participants

Thirty-five undergraduate students were drawn out of a larger pool of recruited volunteers. Twenty-eight participants (fifteen women and thirteen men) completed the task. Mean age was 23.54 years. Of the six participants who were excluded from the

final analysis, three students were not proficient in the English language and had difficulty understanding the instructions, one student behaved in an unusual way and did not follow instructions, and two were eliminated on the basis of reaction time averages deviating from sample's means by more than three standard deviations. All students were paid 10$ for their participation.

Procedure and Apparatus

One individual participated in each experimental session. All participants completed the same experimental procedure as prime manipulation was within subjects. Upon arrival to the laboratory the participant was seated facing a desktop computer Cathode Ray Tube (CRT) screen. In front of the screen was placed a semi-reflective two-way mirror. Individuals could see their own reflection in the two-way mirror only when light intensity of the CRT screen behind it was low. When the CRT screen emitted a high intensity light, individuals saw the image displayed on the computer screen through the semi-reflective mirror.

Participants first read an introduction to the study. The introduction stated that the study was concerned with the visual pleasantness of images when seen through a specialized visual filter. Participants were told that in order to make it easier on their eyes and attention, the experiment was broken down into two sections and the second section included verbal cues as well as images. The true reason for this procedure was to allow participants to practice the use of the keyboard prior to the trait trials, as well as provide a plausible explanation for the presence of the "filter," which was in fact a semi reflective two-way mirror placed in front of the computer screen.

After the introduction was completed the participant was left in the room alone. The participant was left alone because the presence of audience can induce a state of self-awareness (Carver and Scheier, 1978), which would interfere with the experimental manipulation.

During the first section of the experiment participants were presented thirty image trials. Images consisted of an abstract geometric colorful shape. Each image was presented for two seconds followed by a screen with the question "How pleasant is this image for you?" Responses were on 5-point scale with endpoints not at all (1) to very (5). Guidelines provided by Fazio (1990) for reaction time studies were followed. Participants placed their fingers on the 1 to 5 keys on the keyboard, with index fingers of each hand being placed on either the 2 and 3 keys, or the 3 and 4 keys. The participants were instructed to answer these questions as quickly and as accurately as possible. I used Media Lab v2004.2.63 (2004) to present all images and questions and to record all responses and reaction times in milliseconds. After completing 30 image trials, participants were informed that they would complete a second task, which consisted of both image ratings and ratings of character traits.

In the second part of the experiment participants were presented sixty-four trait-trials. The trait trials consisted of the presentation of an initial trait term, the primer trait for 2 seconds followed by a blank screen for 3 seconds and a consequent question referring to a second adjective, the target trait. The question was "How _____ are you?" the blank space consisting of an adjective such as clever. There were eight different types of trait trials. Trials varied along three parameters: whether a mirror was present or not, whether the primer trait term matched the target trait in the consequent

question or not, and whether the question required making a judgment about oneself or an acquaintance. In order to manipulate whether participants could perceive themselves in the semi-reflective screen, I alternated the background of the computer screen between white and black. With a black background participants saw themselves along with the cues presented on the computer screen, whereas a white background resulted in participants only seeing the computer screen. The white or black background was maintained for a total of five seconds.

The other variation in trait trials was in terms of whether the priming and target adjective were matched. In the matching condition, the same trait term was presented as a primer and as a target, whereas in the mismatched condition, the priming trait term was not the same as the target one. For example in a matching trait trial the word *clever* would appear on the screen for two seconds. Following this the participant would be asked how *clever* she thought she was. On a mismatched trait trial a primer adjective such as *athletic* would be presented prior to a participant's being asked how *clever* she thought she was. To alert participants to the possibility that trials may be mismatched some of the time they were informed that a screen with a random trait term will proceed the "How _____ are you? " questions. They were told that these words were not always related to the subsequent question; therefore it is best to ignore them and keep looking at the screen. Participants were instructed again to answer as quickly and as accurately as they can. As before, responses for all trials were on 5-point scale with endpoints not at all (1) to very (5). Responses and reaction times were recorded and stored in a separate file by Media Lab.

The last variation in trait trials was in terms of the person being judged. Half of the trials asked participants to make judgments about the self and the other half asked them to make these judgments about a previously selected acquaintance. The question in this condition was: "How _____ is your acquaintance? the blank was filled with one of the target trait terms. Participants chose an acquaintance before the second part of the experiment resumed. Participants were instructed to choose an acquaintance that they were familiar with to the extent that they could form an opinion about different character traits of this person. They were asked to refrain from choosing someone whom they were extremely close to such as a family member or an intimate partner. Participants wrote the name of the acquaintance on a piece of paper and were asked to refer to this person whenever they would be asked to answer questions about their acquaintance. Participants were asked not to choose family members and partners because research has shown that individuals may identify the self with close others (Aron and Aron, 1991), interfering with the use of the acquaintance condition as a control for the self.

Eight adjectives were chosen as the target traits and were each inserted in the 8 types of trials for a total of 64 trait trials. As this study was part of a larger research effort, trying to understand the way people respond to the Automatic Thoughts Questionnaire (ATQ; Hollon and Kendall, 1980), target traits were chosen to capture the meaning of some of the ATQ original items. For example, the meaning of an ATQ statement such as "I've let people down" was captured by the adjective *untrustworthy* in my study. Antonyms were used half of the time in order to include both positively and negatively valenced adjectives: the item "I can't get started" inspired the use of the adjective *motivated*, an antonym for the original adjective unmotivated. Eight target trait

adjectives were chosen for the purpose of the current study: *satisfied, motivated, responsible, likable, pessimistic, inferior, incompetent,* and *boring*. Adjectives had to meet minimum criteria of frequency of use in the English language (Leech, Rayson, and Wilson 2001) to be included in the study. In addition, thirty-two (16 positively and 16 negatively valenced) priming adjectives were chosen from Anderson (1968) table of personality traits and were checked for an adequate level of frequency of use in the English Language (Hofland, & Johansson, 1982). See Appendix A for primer traits.

Between the 64 trait trials 36 image trials were presented as fillers. The filler stimuli were abstract geometric images similar to the ones presented in the first section. After the image was presented for two seconds followed by a blank screen for another three seconds the question "How pleasant is this image for you?" appeared. Image trials were interspersed between trait trials for an average of one image trial for every two trait trials.

Participants were asked, once again, to answer questions as quickly and as accurately as they can. When the task started the participant saw an abstract colorful image and was asked how pleasant this image was. Next the participant saw a white screen with a trait-word in its center followed by a question of how well the trait describes the participant or an acquaintance. This type of sequence continued according to a predetermined set of rules. For example, two mirror trials were never presented in a row, in order to not allow participants to become desensitized by the presence of the mirror and every two trait trials were followed by a filler image trial.

Results

The focus in the present study was on reaction times for self-referent judgments. I expected that the presence of a mirror would increase self-awareness, and the presence of a matching priming trait would focus participants' attention to that trait. The combination of a mirror and a matching priming trait was expected to lead to fastest response times for self-referent judgments in the mirror (self-aware) condition.

In the present study participants were presented one of eight target trait terms. Participants' reaction time average was calculated for each participant across the target trait terms for each experimental condition. As such, each participant had eight reaction time averages, one for each condition. A 2(mirror, no mirror)*2(matching, mismatched)*2 (self, acquaintance) repeated measures analysis of variance (ANOVA) on reaction times for all eight conditions averaged across the eight trait-terms was initially conducted. I examined the effects of the presence of a mirror, the congruency (matching or mismatched) of the primer trait, and the subject of the target trait question (self or acquaintance) as well as different interaction effects between these three variables on reaction times for self-referent and acquaintance judgments. Reaction times were defined as the times elapsed from the presentation of a target question until the participant's response.

The expectation was for a significant three-way interaction. In contrast to expectations, the three-way interaction between the three variables showed no effect on reaction times (F (1, 28) = 2.50, p = 0.125). This suggests that individuals were not affected by the presence of a mirror in combination with trait term congruency in terms of their reaction times for questions about the self. The analysis revealed a significant

main affect for whether the self or an acquaintance was being judged (F (1, 28) = 7.36, p < 0.02). In line with the notion that self-judgments were more rapid than judgments about an acquaintance, shorter mean reaction times for self ratings (M = 3189, SD = 215) versus acquaintance ratings (M = 3449, SD = 214) were obtained. See Figure 1 and Table 1 for means. I also found a marginally significant main effect (F (1, 28) = 3.67, p<0.07) for the matching of priming traits with target traits, with shorter reaction times for matching trait terms (M = 3223, SD = 204) than for mismatched traits terms (M = 3414, SD = 225). See Table 2 for F values for interaction effects. My original hypothesis that the presence of a mirror would reduce reaction times was not confirmed. There were no other significant effects in the analysis. As such, whether participants perceived their reflection in the mirror had no impact on reaction times in the general sample.

A repeated measures ANOVA for all eight conditions was also performed with gender as a between-subjects factor. This interaction was not significant. Nevertheless, given the novelty of my experimental paradigm and the exploratory nature of this study, I decided to analyze the results separately for women and men. This analysis produced divergent patterns for women and men: no significant main or interaction effects whatsoever were found for men (F (1,12) < 1.00), whereas main effects for self and matching trait terms emerged for women. A significant main effect for self revealed that women were faster (F (1, 14) = 24.03, p <0.01) when answering questions about the self (M = 2681, SD = 219) than when they were answering questions about acquaintances (M = 3026, SD = 220). Similarly, a significant main effect for matching trait terms (F (1, 14) = 9.71, p< 0.01) revealed that women were significantly faster when making judgments for self and acquaintances when the priming and target trait were matching (M = 2769,

SD = 224) relative to judgments made when primer and target trait terms were mismatched (*M* = 2938, *SD* = 213). See Figure 2 and Table 3 for mean reaction times for women. Furthermore, these main effects were qualified by a significant three-way interaction ($F(1, 14) = 8.65, p < 0.02$). See Table 4 for interaction effects for women. This interaction was due to women being faster in making self-referent judgments in the matching condition, while in the absence of a mirror. However, contrary to expectations, the presence of a mirror led to slower, rather than faster reaction times. Women were faster in answering questions about themselves with matching terms when a mirror was not present (*M* = 2481, *SD* = 219) than when answering questions about themselves with matching terms in the absence of a mirror (*M* = 2671, *SD* = 219). The difference between reaction times in the mirror and no-mirror conditions for self-judgments in the matching condition was marginally significant ($t(1,14) = 1.98, p < 0.07$).

Analyses were also conducted to examine whether extremity of ratings differed as a function of experimental manipulations. A 2(mirror, no mirror)*2(matching, mismatched)*2 (self, acquaintance) repeated measures analysis of variance on scores for all conditions revealed no significant effects.

Discussion

Participants in the current study made judgments about themselves and an acquaintance regarding specific target trait terms. Participants were first presented primer trait terms that sometimes matched (matching condition) and other times differed (mismatched condition) from the target trait terms. Following this, participants answered a question about target trait terms. During half of the experimental trials participants saw their reflection in a semi-reflective two-way mirror (mirror condition), whereas the rest of

the time they viewed a blank white computer screen through the semi-reflective surface (no mirror condition). As a control, participants answered the same questions about the self (self condition), and a pre-selected acquaintance (acquaintance condition). Overall, there were eight experimental conditions for each subject in within-subject design.

I expected that participants would have shortest reaction times when making self-referent judgments in the mirror condition when the priming trait terms matched the target trait terms. Similarly, I predicted that for the self-referent judgments longest reaction times would be observed in the mirror condition when priming and target trait terms did not match. Contrary to expectations, response latencies for the overall sample were not shortest in the mirror condition for matching trait terms, nor were they longest for self-referent trait terms in the mirror condition for mismatched trait terms. Differences that were observed in the speed of processing of self-referent information were due to female participants. When response latencies of women and men were analysed separately results indicated that females were faster when judging the self as compared to an acquaintance, whereas no differences in reaction times were observed for men in any of the conditions. The finding that individuals responded faster to self-referent questions is consistent with previous findings that individuals tend to be faster and more efficient when processing information about the self (Markus, 1977). A popular explanation for this finding has been that people are able to answer questions about themselves because they presumably know themselves better, and because they process self-relevant information at a deeper level by elaborating on it (Craik and Tulving, 1975). Other researchers have attributed better memory and faster processing of self-relevant

information to the role the self plays in organizing semantic information (Klein and Kilhstrom, 1986).

To further understand the patterns of responses to self-relevant questions, an analysis of the results was reproduced with gender as a between-subjects factor. Although this analysis did not yield significant interactions, the data was analyzed separately for women and men. The rationale for this analysis was based on the idea that this study was exploratory in nature. As such, any information that could provide a hint as to how people go about answering self-relevant questions would be meaningful, if not significant.

These separate analyses revealed that female participants answered self-relevant questions within shorter amounts of time when the priming trait term matched the target trait term, and only when they did not see their reflection in a mirror. In other words, contrary to expectations, results suggested that the presence of the mirror minimized rather than enhanced women's ability to make quick spontaneous judgments about the self. Before suggesting some plausible explanations for the obtained results it is important to note that participants did not judge themselves more favorably when they saw their reflection in a mirror. Actual scores for self-referent and acquaintance judgments did not differ significantly in any of the conditions in terms of their extremity. This suggests that any differences in reaction times for different conditions were not due to the content of individuals' judgments. If individuals were to judge themselves more favorably in the presence of the mirror we would have to take in to consideration the possibility that it is easier to make positive statements about the self than negative ones, and that this accounts for differences in reaction times.

The original rationale of the study was that self-awareness would lead to a spontaneous judgment of the self vis-à-vis a suggested standard, i.e. the primer. This judgment would then render information regarding that trait accessible, thus facilitating faster responses on a subsequent question referring to that term. An alternative explanation could be that participants used the time elapsed from the presentation of the primer to the appearance of the target question to consciously deliberate about the word in terms of their own character traits. Such initiation of the answering process would be effective in speeding-up the answering process when priming and target trait match and referred to the self but not when they differed or referred to an acquaintance. The probability that a question will match the primer term and refer to the self is one out of 4. In other words, by using a strategy of conscious deliberation of self-referent primer terms participants would be at an advantage in answering question about the self only 25% of the time. More often than not such a strategy would interfere with the process of providing answers. Open-ended self-reports provided during a brief interview following the experiment indicated that participants did not have a bias toward making self-referent judgments before the question appeared. Based on the above reasoning and participants' reports it is unlikely that this strategy was used.

Another possibility is that participants initiated deliberate thinking about the primer trait-term alternating between self and acquaintance randomly prior to the presentation of the question. It may be argued that participants' preoccupation with the target question overruled the mirror manipulation, so that their attention was directed externally at the priming cue, and in response, internally at the answer, somehow bypassing the mirror manipulation altogether. Such a strategy would lead to slowed-down

response times when the target trait in the following question does not match the primer. In this sense, processing of the priming trait term would interfere with producing responses in the mismatch condition. If this explanation were true, different types of results should have been observed for matching versus mismatching conditions. This was not true for the general sample or for the male participants. Therefore, this explanation also is not very plausible.

The lack of significant results in the overall sample could perhaps be explained in terms of salient standards of behaviour. Although my intention was to provide standards of behaviour through the priming trait terms it is possible that participants perceived different standards depending on personal preferences. For example, participants were instructed to answer questions as quickly and as accurately as possible. It is possible that the state of self-focused attention leads to an increased motivation to provide accurate responses. Conversely, some participants may have perceived the speed standard as salient and made an effort to answer as quickly as they could regardless of the specific condition. Others, may have instead perceived standards of accuracy as most important and focused on being as honest and accurate in their responses as possible, neglecting the issue of speed. Such individual difference in perceptions of salient standards may be related to individuals' pre-existing schemas (Markus, 1977) of honesty versus efficiency and speed. As previous research has shown, for individuals who possess a strong schema of honesty, the presence of a self-focusing stimulus can enhance their commitment to providing accurate accounts (Gibbons, 1983). Whether honesty, accuracy or speed standards became salient, the priming traits would have been inefficient in eliciting spontaneous judgments regarding these traits. Given that standard salience was not

measured independently this is a limitation that the current study shares with many of its antecedents.

A related limitation is whether some of the priming adjectives evoked an internal state of discomfort and a desire to avoid self-focused attention. It is possible that for some self-focused individuals the word *clever* evoked a sense of discrepancy between the ideal level of intelligence aspired to, and their real level of cleverness. According to objective self-awareness theory individuals may seek to reduce this discrepancy by avoiding the state of self-awareness (Greenberg and Musham, 1981). In such cases individuals may invest significant efforts in trying to avoid self-awareness and distract themselves, so that reaction times may in fact be longer for these adjectives that create internal dissonance than for neutral ones. Despite this possible tendency participants were instructed to stay focused on the screen, so that distraction by looking away from the mirror would have meant that participants were not following instructions. As in any study the assumption is that most participants are cooperative most of the time and follow instruction. Furthermore, even if participants chose to look away from the mirror they would still be aware of its presence and therefore remain self-aware.

An especially intriguing question is why women, but not men, responded to self-referent questions faster when primer and target trait matched in the absence of a mirror. As mentioned above, this finding was contrary to my prediction that the presence of the mirror would lead to shorter latencies in the self-referent match condition. One possible explanation is that women in general are better at following instructions, whereas men are distracted by attempts to "figure out" the experiment. This could explain why women were more affected by the presence of a corresponding priming trait-term: women

continued looking at the screen as they were instructed, resulting in a main affect for the correspondence affect (i.e. shorter reaction times). Furthermore, it is possible that standards of speed and accuracy are less relevant for women than men. Speed and accuracy might be more relevant to agentic traits associated with masculinity and characterising men's standards of behaviour. While this theoretical account explains the effects of matching trait terms for self in women, it does not explain why the mirror should elicit an opposite effect than the one expected.

Women may have been slower in making self-referent judgments in the presence of a mirror because the mirror elicits different concerns and salient standards for them. I suggest that women are often socialised to be sensitive to issues of self-image and appearance. It is possible that the primer trait term failed to act as a standard because it was overridden by a much more salient one, namely the standards of appearance and "looks". In previous studies self-awareness was induced by means of a mirror, and yet did not reveal gender differences. However, it is important to remember that these studies did not use reaction times as a measure of self-focus. It is possible that the initial reaction to one's image, particularly to features such as hair, makeup, or general look, are salient during the first few seconds of self-awareness. After a few seconds the participant may habituate to these details and be more likely to tune in to internal aspects of the self such as character traits. In the present study, the short flashes of one's reflection may have elicited a self-evaluative process with regard to one's physical appearance. The trial did not last long enough for this process to be extinguished and therefore evaluations regarding other standards could not preside. This explanation is consistent with participants' reports during a brief interview following debriefing. Women participants

made comments about their hair, make-up etc., suggesting that they were self-conscious about their looks. A main effect for the mirror, slowing down female participants across all conditions was not found. This suggests that is only in the context of being self-evaluative and processing self-relevant information that women are susceptible to the interference of the mirror.

Whether people can enter and exit a state of self-awareness in the span of several seconds is an additional question of interest. The present study consists of a novel manipulation that has not been tested before. It is possible that individuals stop being self-aware after a few trials because they habituate to the manipulation. Alternatively, they may remain in a state of self-awareness following exposure to the mirror. This, however, has not been supported by prior research, which suggests that self-awareness occurs automatically and that it is a transient state.

In an experimental manipulation where trials are presented in close proximity to one another the effects that one self-focusing trial might have on the next are unknown. Evidence from self-awareness and emotional reactivity may be informative in as far as subjective emotional experience during a self-focusing trial may interact with a person's disposition and affect responses on the following trial. Research has shown that depressed individuals have a tendency to seek a self-focused state following a failure, while non-depressed individuals seek to avoid it (Greenberg and Pyszczynski, 1986). The discrepancy between the real self and the ideal self, which becomes salient during the state of self-awareness, may lead to negative emotions. Depressed individuals are more likely to persist in this state longer, while non-depressed individuals will try to avoid the self-focused state. In the current study individuals could attempt to avoid self-awareness

or alternatively persist in a state of self-awareness even after the self-focusing stimuli is no longer present, i.e. during no-mirror trials. Thus predisposition for depressive states may interact with repeated manipulations of self-awareness especially if the self-standard evaluation is experienced as a failure. Since findings by Greenberg and Pyszczynski, (1986) were obtained for clinically depressed individuals it is difficult to gouge their applicability to the current study. Presumably most individuals in my sample of undergraduate students would have not met criteria for clinical depression.

Future studies may choose to disentangle the effects of negative mood and experimentally induced self-awareness by measuring levels of depression and other chronic conditions prior to the induction of self-awareness. Researchers may also utilize various tools in order to assess the effects of dispositional self-awareness on situational self-awareness and account for possible interactions between dispositional variables and the experimental induction of self-awareness. Independent validation of salient standards may prove to be one of the most important additions in self-awareness research in general, and in studies similar to the present one in particular. The repeated use of the novel apparatus presented in this study through future projects may add to our understanding of how it triggers transient states of self-awareness. It may prove to be an extremely useful way of inducing self-awareness and manipulating different standards of behaviour simultaneously. Finally, more research will be needed in order to elucidate some of the fundamental differences between men and women in terms of saliency of standards.

Reaction times in milliseconds for self-referent trait terms for overall sample

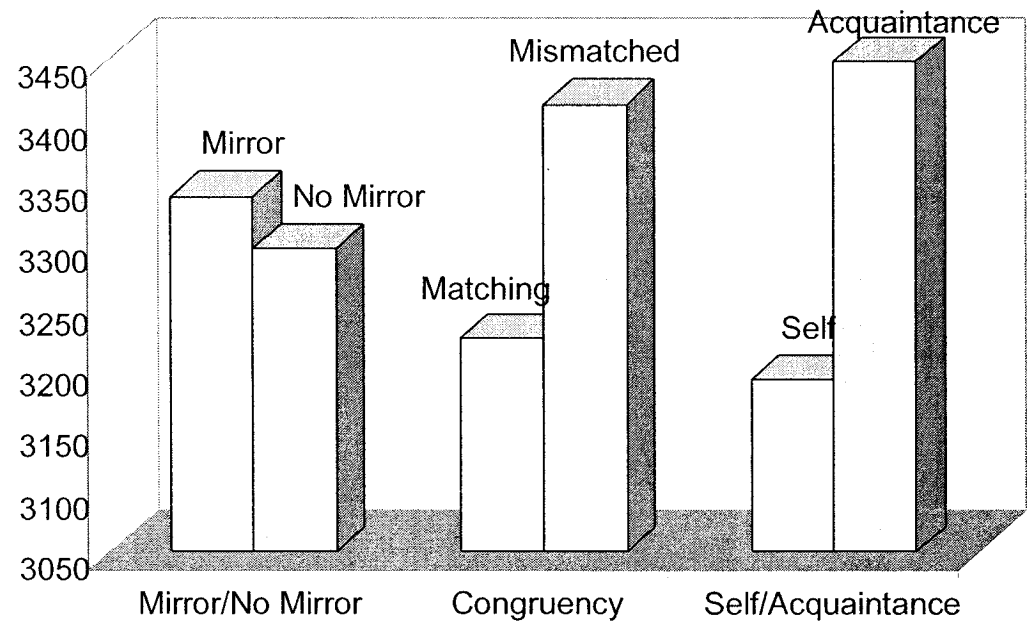

Figure 1

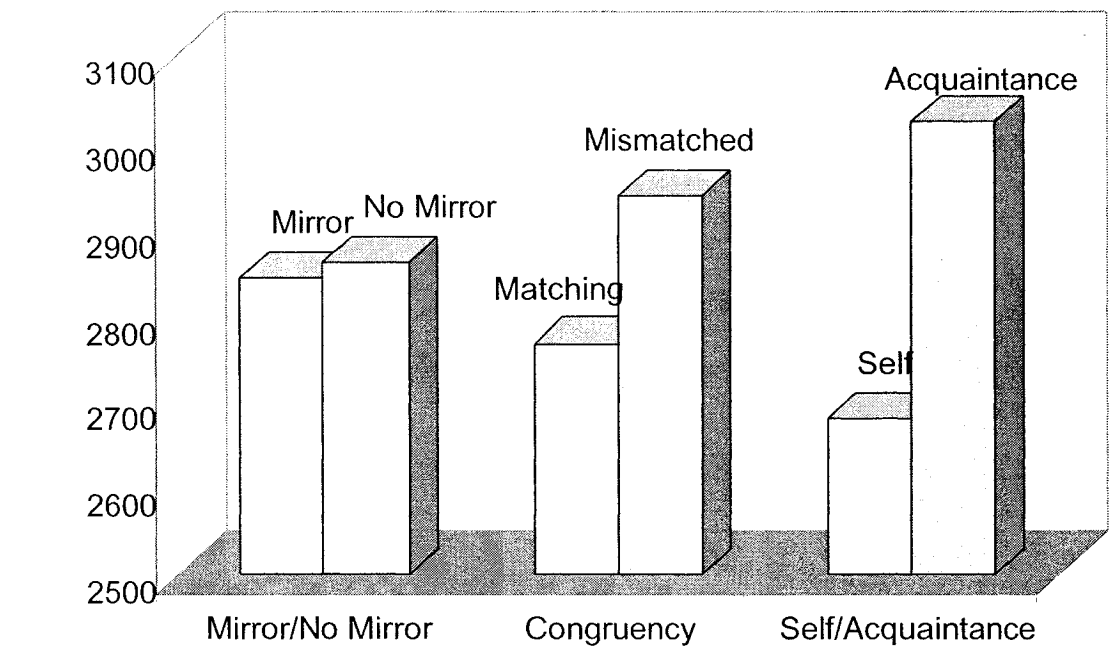
Reaction times in milliseconds for self- referent trait terms for women
3100
3000
2900
2800
2700
2600
2500
Mirror
No Mirror
Matching
Mismatched
Self
Acquaintance
Mirror/No Mirror
Congruency
Self/Acquaintance

Figure 2

Table 1 Reaction times for self-referent trait terms for the overall sample

Condition	Mean Reaction Time	Std. Error
Mirror	3341	211
No Mirror	3298	212
Matching	3224	205
Mismatched	3415	226
Self	3120	216
Acquaintance	3449	215

Table 2 Main and Interaction Effects for the overall sample within-subjects tests

Condition	F	Significance	Partial Eta Squared
Mirror	.60	.44	.02
Match/Mismatch	3.67	.07	.12
Self/Acquaintance	7.36	.01*	.20
Mirror*Match/Mismatch	2.69	.11	.09
Mirror*Self/Acquaintance	.64	.43	.02
Match/Mismatch * Self/Acquaintance	.17	.68	.01
Mirror* Match/Mismatch * Self/Acquaintance	2.50	.12	.08

Note. $p < .01$

Table 3 Reaction times for self-referent trait terms for women

Condition	Mean Reaction Time	Std. Error
Mirror	2845	217
No Mirror	2863	221
Matching	2769	225
Mismatched	2939	213
Self	2681	220
Acquaintance	3027	220

Table 4 Main and Interaction Effects for women within-subjects tests

Condition	F	Significance	Partial Eta Squared
Mirror	.09	.77	.01
Congruence	9.71	.01*	.41
Self/Acquaintance	24.03	.00*	.63
Mirror* Match/Mismatch	.07	.79	.01
Mirror*Self/Acquaintance	3.90	.07	.22
Match/Mismatch* Self/Acquaintance	.56	.47	.04
Mirror* Match/Mismatch * Self/Acquaintance	8.65	.01*	.38

Note. $p < .01$

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Appendix A

List of priming trait terms

Amusing
Angry
Anxious
Considerate
Critical
Energetic
Ethical
Friendly
Happy
Intelligent
Kind
Lively
Mature
Nervous
Silly
Unreliable