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Intuition and Correspondence between Implicit and Explicit Self-Esteem

by

Mervyn Lee Whitfield

Bachelor of Arts, University of Waterloo, 2004

THESIS

Submitted to the Department of Psychology

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Abstract

Implicit self-esteem has recently been the focus of much research. Implicit self-esteem is distinct from explicit self-esteem and uniquely contributes to the prediction of behaviour. Relatively little is known about the nature of implicit self-esteem, however. This research examines moderators of the relation between implicit self-esteem and self-reports of self-esteem. A stronger focus on intuition was expected to increase the relation between implicit self-esteem and self-reports of self-esteem. Study 1 concerned whether high faith in intuition was associated with self-reports of self-esteem that more closely reflect implicit self-esteem. Implicit self-esteem, explicit self-esteem, and faith in intuition were measured. This study revealed that the state self-esteem of highly intuitive people corresponded more closely to their implicit self-esteem compared to those who rely on intuition less. Study 2 was intended to more directly test whether heightened intuition causes self-reports of self-esteem to reflect implicit self-esteem. A manipulation of intuitive or rational mindset was designed to induce some participants to focus more on intuition. In the intuitive condition, but not in the rational condition, speeded self-evaluations reflected implicit self-esteem. The findings from these studies suggest that implicit self-esteem may be preconscious and may be associated with intuition. Implications for how implicit self-esteem is experienced are discussed.

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Intuition and Correspondence between Implicit and Explicit Self-Esteem

Imagine there are two sides to Jen: She acts self-assured in many situations, but expresses feelings of worthlessness. A worker in juvenile corrections, Jen withstands violent attacks with composure, faces threat with calm. Her coworkers admire her for her confidence, and view her as a leader. Meanwhile, Jen's close friends know that she feels differently about herself. She has long expressed feelings of worthlessness, sadness, frustration, yet she backs her words with contrary behaviour. Many people seem to be like Jen, in that their actions may seem inconsistent with their professed self-views. Just as Jen behaves confidently but expresses low self-esteem, other people may profess having high self-esteem but behave insecurely. Does Jen ever acknowledge and express the confidence in herself that her behaviour reflects? Can people have more than one self-evaluation at the same time? If two self-evaluations conflict in their assessments, as with Jen, can people be aware of both self-evaluations? Could some situations make people more or less aware of one self-evaluation or another?

Evidence for Two Distinct Sources of Attitudes

Implicit memory. Recent research and theorizing in social psychology suggest that people can have more than one self-evaluation, and that the two self-evaluations may occasionally conflict (Greenwald & Banaji, 1995; Greenwald & Farnham, 2000; Spalding & Hardin, 1999). Researchers have recently begun exploring implicit self-esteem, automatic affective reactions that are associated with the self. Examination of the existence of implicit attitudes was extended from work in cognitive psychology on the existence of separate implicit and explicit memory systems (Smith & DeCoster, 2000). Such cognitive studies revealed that people can have implicit memory for an event, being

incapable of explicitly, verbally expressing memory for the event, yet demonstrating learning that occurred as a result of the event (Schacter, 1996; Schacter, McGlynn, Milberg, & Church, 1995). Dramatic evidence of implicit memory came from brain damaged individuals who were unable to store new memories but showed evidence of behavioral learning from past experience (Schacter, 1996). The intact system that was responsible for their learning is now called implicit memory (Schacter, 1996; Schacter et al., 1995).

Dual attitudes. If implicit memory is capable of influencing relevant behaviour, perhaps people can have implicit knowledge that exerts influence on judgments and feelings in observable ways. In general, all attitudes may exist simultaneously in the form of conscious opinions and beliefs, and nonconscious evaluations (e.g., Epstein & Morling, 1995; Smith & DeCoster, 2000; Wilson, Lindsay, & Schooler, 2000; cf. Fazio & Olson, 2003). There are many questions concerning the nature of the nonconscious evaluations. Though they are thought to exist outside of awareness, such implicit attitudes may nevertheless influence beliefs, judgments, feelings, and behaviour, of the individual (e.g., Greenwald & Banaji, 1995).

Though perspectives vary, many theorists agree that outwardly expressed attitudes do not tell all about the evaluation of a given object, because there may also be an implicit evaluation of the object or concept in addition to the explicit attitude (e.g., Wilson et al., 2000). Examination of implicit attitudes may contribute to our overall understanding of attitudes, in general. Much research thus examines the nature of implicit attitudes, their source, and their influence on behaviour (e.g., Fazio, Jackson, Dunton, & Williams, 1995; Greenwald & Banaji, 1995; Karpinski & Hilton, 2001). From the dual

attitude perspective, attitudes about the world, about objects, people, locations, and concepts may all have both an explicit and implicit source. Implicit measures have been broadly applied, for example, comparing implicit attitudes of flowers versus insects (Greenwald, McGhee, & Schwartz, 1998; Karpinski & Hilton, 2001), instruments versus weapons (Greenwald et al., 1998), implicit attitudes for gender self-concept (Greenwald & Farnham, 2000), and implicit attitudes of racial prejudice (e.g., Fazio et al., 2005), to name a few.

Attitudes about the self. Moreover, when thinking about the self, people may even have implicit and explicit attitudes, implicit self-esteem and explicit self-esteem. Understanding how people experience implicit self-esteem may shed light on the experience of implicit attitudes and on self-esteem. To examine how people experience their implicit self-esteem, we questioned whether people can ever be aware of implicit self-esteem, for example, whether there are mindsets that promote such awareness. Reasoning that intuitive thinking may lead to greater awareness of implicit self-esteem, we predicted intuitive thinking would enhance the influence of implicit self-esteem on explicit self-reports. Two studies test this possibility.

Distinguishing between Implicit Self-esteem and Explicit Self-esteem

Implicit self-esteem is generally defined as self-evaluations that are uncontrollable, spontaneous, efficient, and nonconscious (Bargh & Chartrand, 1999; Karpinski & Hilton, 2001). Explicit self-esteem is defined as self-evaluations that are controllable, deliberative, effortful, and conscious. Researchers have traditionally measured self-evaluation directly by asking people to complete questionnaires measuring attitudes toward the self (Heatherton & Polivy, 1991). Clearly expressed, and directly

measured, self-reported self-evaluation seemed to capture self-esteem. Self-reports might not tell the whole story about self-esteem, however, for implicit self-esteem adds to the prediction of behaviour over and above explicit self-esteem (Bosson, Brown, Zeigler-Hill, Swann, 2003; Greenwald & Banaji, 1995; Jordan, Spencer, & Zanna, 2003; McGregor & Marigold, 2003; Spalding & Hardin, 1999). Conventional self-report questionnaires measuring introspectively accessible attitudes about the self assess explicit self-esteem. Explicit self-esteem measures require respondents to report their thoughts and feelings about the self. Measurement of implicit self-esteem typically relies on an indirect, covert method of assessing self-evaluation (Greenwald & Banaji, 1995).

Consideration of implicit self-esteem may contribute substantially to the overall understanding of self-esteem (Bosson et al., 2003; Jordan et al., 2003). Explicit self-esteem is a heterogeneous construct with sometimes widely differing and inconsistent predictions of behaviour (Baumeister, Campbell, Krueger, & Vohs, 2003). High explicit self-esteem has been shown to predict a broad spectrum of behaviour from the adaptive to the detrimental (Baumeister et al., 2003). For example, children with high explicit self-esteem are more likely either to be a schoolyard bully, or to stand up to schoolyard bullies (Salmivalli, Kaukianen, Kaistaniemi, & Lagerspetz, 1999). Implicit self-esteem may help to explain why self-esteem is heterogeneous. Implicit self-esteem, when considered in combination with explicit self-esteem, can differentiate between those with high explicit self-esteem as being either secure or defensive (Jordan et al., 2003). In research, the inclusion of implicit measures may refine theorizing about self-evaluation beyond what is possible through self-report alone (Bosson et al., 2003; Jordan et al., 2003). Further, because implicit attitudes sometimes disagree with direct measures,

discrepancies between implicit and explicit attitudes may demonstrate the unique role of implicit attitudes (Greenwald & Banaji, 1995).

Dissociation between implicit and explicit self-esteem. One way to view such dissociation of implicit and explicit attitudes is that implicit attitudes reflect true attitudes, whereas explicit attitudes are prone to socially desirable responding (Greenwald & Banaji, 1995). People are thought to be unaware when implicit attitudes are measured because the measures are indirect and they are not told of their purpose (Bargh & Chartrand, 1999; Greenwald & Banaji, 1995). Because of this, measuring implicit attitudes was valued as a way to eliminate socially desirable responding. In implicit stereotyping research, it was thought that some people might voice egalitarian views, but really hold negative stereotypes toward some groups (e.g., Fazio et al., 1995). Indeed, indirect measures of automatic stereotyping do not always match reports of personal beliefs (e.g., Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002; Son Hing, Li & Zanna, 2002). In this area of research, some people demonstrate automatic activation of negative evaluations of minority group members, whereas in verbal reports they voice more favorable attitudes (e.g., Fazio et al., 1995; Son Hing et al., 2002). Thus Fazio and colleague's research may have contributed to the status of measurement of implicit attitudes as a good way to circumvent socially desirable responding, which has gained some acceptance (Greenwald & Banaji, 1995; Greenwald & Farnham, 2000). There may be other possible distinctions between implicit and explicit attitudes, because there is increasing evidence that both self-evaluations reflect distinct attitudes, each with its own source in two separate systems (Wilson et al., 2000).

Predictive Validity of Implicit Self-esteem

Implicit and explicit self-evaluations are both influential and distinct attitudes that have been shown to affect behaviour (e.g., Spalding & Hardin, 1999). Although implicit self-esteem has the potential to affect judgments and behaviour, the behaviour it predicts is often distinct from explicit self-evaluation (Bosson et al., 2003; Greenwald & Banaji, 1995; Karpinski & Hilton, 2001; cf. Smith & DeCoster, 2000; Spalding & Hardin, 1999). In one study, explicit self-esteem predicted reports of anxiety, whereas implicit self-esteem predicted observers' ratings of the person's anxiety during a mental health interview. This demonstrated that the implicit measure predicted less controllable behaviour and the explicit measure predicted more controllable behaviour (Spalding & Hardin, 1999). Those with high implicit self-esteem have also demonstrated more persistence in the face of failure than those with low implicit self-esteem (Jordan et al., 2003). Having high explicit self-esteem but low implicit self-esteem was found to be associated with more unrealistic optimism, having smaller discrepancies between actual and ideal selves, and preferring an excessively positive personality profile (Bosson et al., 2003). Some research has distinguished between high self-esteem that is fragile versus secure (Kernis & Paradise, 2002), and Bosson and colleagues (2003) suggest that implicit self-esteem may help make this distinction. They suggest that people with high explicit self-esteem and low implicit self-esteem have fragile high self-esteem, but those with high implicit self-esteem have secure high self-esteem. Therefore, although implicit measures of attitudes may circumvent socially desirable responding, knowledge of implicit self-esteem in addition to explicit self-esteem also improves our prediction of self-relevant behaviour, and demonstrates the discriminant validity of implicit and

explicit self-esteem (see also Jordan, Spencer, & Zanna, 2003; McGregor & Marigold, 2003).

Interaction of implicit and explicit self-esteem. Other evidence also suggests that people with high explicit self-esteem but low implicit self-esteem were shown to rigorously defend their positive self-views (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003). Claiming high explicit self-esteem and having low implicit self-esteem is a pattern termed defensive high self-esteem, because this pattern of self-evaluation has been associated with self-protective behaviour. Evidence of this defensiveness was found when people with high explicit and low implicit self-esteem scored the highest on a measure of narcissism compared to individuals with any other combination of implicit and explicit self-esteem. Such individuals also showed greater self-protection through dissonance reduction in a free choice decision paradigm. People with defensive self-esteem showed greater dissonance reduction by rationalizing their decisions in a way that upheld their positive self-views (Jordan, Spencer, Zanna et al., 2003). In another study, defensive high self-esteem was associated with more ingroup bias. Ingroup bias is seen as a means of self-enhancement because it makes one look good by association, and past studies reveal that showing ingroup bias enhances self-esteem (Hewstone, Rubin, & Willis, 2002). People with defensive high self-esteem, compared to individuals with high explicit and high implicit self-esteem, showed greater ingroup favoritism, reflecting a tendency to enhance self-esteem. Again, implicit self-esteem distinguished people with high self-esteem as relatively defensive or secure in this behaviour (Jordan, Spencer, Zanna et al., 2003).

In another study when people with defensive high self-esteem experienced personal uncertainty, they responded by hardening their attitudes (McGregor & Marigold, 2003). Personal uncertainty is threatening because it disrupts the ability to decide and act. When those with defensive high self-esteem were threatened in this way, in order to reduce the threat, they held their attitudes with more certainty and believed their attitudes were more consensual compared to those who did not experience the threat. Individuals with other combinations of explicit and implicit self-esteem did not show the same hardening of their attitudes in response to threat. In sum, defensive high self-esteem is a pattern of discrepancy between the two self-evaluations that seems to be important in predicting self-relevant behaviour (Jordan et al., 2003).

The opposite discrepant pattern, having low explicit self-esteem and high implicit self-esteem, is also important in predicting self-relevant behaviour. Having low explicit self-esteem is associated with depression (Baumeister et al., 2003), but implicit self-esteem may moderate this relation. In a longitudinal study of university students, people with low explicit and high implicit self-esteem were less depressed than those with both low explicit and low implicit self-esteem and became less depressed over time (Logel, Jordan, Spencer & Zanna, 2005). Implicit self-esteem contributes to the prediction of behaviour, in addition to the traditional explicit self-report measures.

The Relation between Implicit and Explicit Attitudes

Both measures of self-esteem, one might assume, should agree with each other reasonably well. This is not the case, however, as knowledge of the level of one does not contribute to the prediction of the other. In other words, the two constructs do not correlate. More broadly, implicit attitudes generally do not correlate with explicit

attitudes (Fazio & Olson, 2003; Greenwald & Banaji, 1995). However, for some attitudes, such as those that are mundane or not socially controversial, correspondence between explicit and implicit measures may exist (Fazio & Olson, 2003). Attitudes about the self, however, do not meet these criteria, and implicit and explicit self-esteem have consistently been shown to be independent (e.g., Bosson et al., 2000).

Though implicit and explicit attitudes tend to be independent, some situations or some people may reveal a higher correlation between implicit and explicit attitudes (Fazio & Olson, 2003). Some researchers have suggested implicit self-esteem may correspond with explicit self-esteem under certain conditions and that research should seek situations when this is so (Pelham, Koole, Hardin, Hetts, Seah, & DeHart, 2005).

It is important to understand when and why implicit and explicit self-esteem will correlate and some preliminary research suggests that gender may influence this relation (Pelham et al., 2005). Pelham and colleagues (2005) showed that females have more correspondence between implicit and explicit self-esteem than males. They argue that finding conditions that increase the correspondence between implicit and explicit self-esteem is important because this may shed light on the nature of implicit self-esteem. In addition to shedding light on the nature of implicit self-esteem, we suggest that predicting the correspondence between implicit and explicit self-esteem also seems relevant to understanding why the discrepancy between them is an important predictor of behaviour. Further, the research may contribute to understanding correspondence between implicit and explicit attitudes, more generally. An understanding of the source of and relation between the two self-evaluations might aid predictions of when and why implicit and explicit self-esteem correlate.

Sources of Implicit and Explicit Attitudes

Implicit and explicit self-esteem may be closely related to different processing systems (Epstein & Morling, 1995; Jordan, Spencer, & Zanna, 2003; Smith & DeCoster, 2000). Many theorists suggest that the mind has two distinct modes of perceiving, interpreting, responding to, and cataloguing information and experiences, each with their own basic function. Smith and DeCoster (2000), for example, propose the existence of two basic memory systems: a fast- and a slow-learning system. Smith and DeCoster propose that the two systems have different rules of operation. They are not just stores of different types of information, because the two systems accommodate two functionally incompatible demands: One is to aggregate a lifetime of experiences based on slowly and incrementally learned information, and the other is to allow the individual to learn rapidly from a single experience. According to the theory, both systems are functionally adaptive, because the requirements of fast and slow learning are incompatible, and thus these distinct systems independently suit the divergent needs of humans.

According to Smith and DeCoster the slow-learning system uses cue-based, effortless, automatic retrieval of associative information. It functions to collect and catalogue information from overlapping systems such as sensory, perceptual, and motor output, so that it can interpret incoming information. Associative processing is part of the slow-learning system. Associative processing is based directly on the properties of the slow-learning system and operates through patterns of coupled representations. After accumulating the associations of many experiences, the slow-learning system uses the experiences to fill in information, such as characteristics that have previously been observed or affective reactions that have previously been experienced in similar

situations. Through associative processing, therefore, if two stimuli have been linked repeatedly in the past, then the perception or thought of one stimulus will bring the other to mind. This is a rapid process that occurs automatically. For example, the first falling snowflake one sees in autumn may carry with it a vast collection of associations that are composed of all one's past experiences with falling snowflakes: Cold, shoveling, shorter days, ice, Christmas, etc. Thus, the function of the slow-learning system is to interpret incoming information in order to generate output in response to the incoming information, such as categorizing information, or filling in missing details. Just as it takes many, many snowflakes to turn the world white, however, learning within this system occurs in small, incremental changes, over multiple episodes. If one enjoys winter scenes, one may learn to associate winter with positive feelings over time. One negative experience, such as putting a car in a ditch, will not override this learned association. The operation of this system generally does not depend on conscious awareness or attention; it occurs spontaneously, efficiently, effortlessly, and one need not be aware of its operation.

The fast-learning system uses rule-based, effortful, conscious retrieval of symbolically stored information. It allows retrieval of the details of experiences, such as a January morning spent with one's car in the ditch, on a future occasion. Thus explicit memory is derived through this system (Smith & DeCoster, 2000). In daily life, people rely on the fast-learning system to complement the slow-learning system, so that they can, for example, focus on the meaning in situations, choose what to attend to, and rely on the counsel of their reasoning (i.e., drive slower, and take the ploughed roads). This learning occurs immediately so that after one time in the ditch one can change behaviour

right away to make it less likely to happen again. Further, unlike the slow-learning system, the fast-learning system is accessible to conscious awareness and requires attention. The fast-learning system attends to the details of events and stimuli that are novel and interesting in order to allow the important details of a single event to be retained for future recall.

Rule-based processing is an effortful and conscious process, using symbolically encoded knowledge, which rests on human linguistic abilities. According to the theory, rule-based processing draws on both underlying memory systems, slow- and fast-learning. When information is noticed, to determine whether or not it is important, one begins to search for information in memory to which to link the new information (Schacter, 1996). Because rule-based processing draws on both underlying memory systems to do this, not only does the fast-learning, conscious system influence the symbolically encoded knowledge, but the slow-learning, nonconscious system also has potential to transfer knowledge and influence the interpretations and conclusions drawn through the fast-learning system (Smith & DeCoster, 2000). The knowledge of rule-based processing is symbolically transferred (i.e., through words). Interpersonal transfer of symbolically encoded knowledge is necessary because humans cannot transmit thoughts and experiences to each other directly. Because of this, most shared knowledge exists in symbolic form, and in this form it attains the highest subjective validity (Smith & DeCoster, 2000; cf. Epstein & Morling, 1995). Through conscious attention, symbolic information can be learned on a single occasion.

Smith and DeCoster outlined differences in evaluative views of the associative processing mode. According to these authors, some researchers characterize the

associative processing mode as relatively less accurate, and rule-based processing as an adjustment from the automatic evaluation toward greater accuracy. For example, interfering with one's ability to consciously monitor stereotype activation produces stereotype consistent evaluation of ambiguous behaviour (Devine, 1989). Similarly, cognitive busyness, such as that which is caused through social interaction, interferes with accurate impression formation (Gilbert & Osborne, 1989). Further, consumer decision-making is guided predominately by peripheral details when the decision is not personally relevant, but by central details when it is personally relevant (Petty, Cacioppo, & Schumann, 1983).

Though these researchers outline situations that emphasize the importance of rule-based processing, other models emphasize the importance of both types of processing modes for successful task completion (e.g., Epstein & Morling, 1995). Theories that convey the importance of both types of processing (e.g., Epstein & Morling, 1995) seem most relevant to understanding the sources of implicit and explicit attitudes, as they are currently conceptualized; that is, dynamic and simultaneous processes that independently contribute to behaviour.

Cognitive Experiential Self-Theory. Among the dual-process models summarized by Smith and DeCoster, Cognitive Experiential Self-Theory (CEST) is a model with the most direct application to personality theory (Epstein & Morling, 1995). The dual-process modes labeled associative processing and rule-based processing are roughly equivalent to the dual-process modes of CEST labeled experiential processing and rational processing. Smith and DeCoster propose that rule-based processing and rational processing modes are very similar; both are said to be the mode that operates

consciously, with effort, and motivation. The associative processing and experiential processing modes are also similar in that both are said to be the mode that operates nonconsciously, effortlessly, and without intention. The rational system involves deep, effortful, and abstract thinking with logic or contextual analysis, whereas the experiential system involves quick, holistic, and concrete judgments based on visceral sensation or affect.

CEST, similar to Smith and DeCoster's model, holds that both capacity and motivation are required for rational processing. Further, in both models the dual-processes are argued to operate in parallel. One way the two models differ is in their view of the perceived subjective validity of the experiential (associative) processing mode. According to Smith and DeCoster's model, there are limited situations where the outcome of associative processing is subjectively compelling, whereas CEST emphasizes that experiential processing gives the perceiver subjectively compelling results.

Compared to other dual-process models, Epstein's theory emphasizes subjective trust of the products of experiential processing. Feeling compelled to do something that one knows they should not is popularly called conflict that occurs between "the heart and the mind," and is given as an example that demonstrates the influence of the experiential processing mode (Epstein & Morling, 1995). Smith and DeCoster argue that people predominately validate symbolic, socially accepted knowledge because it is shared and is perceived as subjectively compelling, whereas Epstein emphasizes that the products of experiential processing can be perceived as subjectively compelling even in the absence of a logical and deliberative explanation.

Cognitive Experiential Self-Theory Applied to Implicit and Explicit Self-esteem

Influence of the two modes. When processing information, or interacting with the world, people use some combination of both rational and experiential systems (Epstein, 1998). If we are to understand when and why implicit self-esteem and explicit self-esteem will correlate, evaluating individual and situational differences may provide some direction. Epstein characterizes the activation of the processing modes as a product of constraints of the environment and the individual. Activation of each mode is thus determined by joint personality and situational influence. Behaviour, affect, and cognition are influenced by the dynamic interaction between the two processing modes, and this theory may allow specific predictions about how implicit and explicit self-esteem are related, when and for whom.

The two processing modes are largely independent and provide unique information. People vary in the extent to which they rely on each mode, and relying heavily on one does not require neglect of the other. Thus, a chief argument of the theory is that the two modes exist separately and cannot be assumed to vary along a single continuum. The Rational-Experiential Inventory (REI) measures rational processing and experiential processing with two scales: The Need for Cognition scale, which measures ability and engagement in rational processing and the Faith in Intuition subscale, which measures ability and engagement in experiential (intuitive) processing. The two scales each capture an independent mode instead of measuring the modes with just one scale as though they work in direct opposition. Discriminant validity exists between the two scales, as rational and intuitive processing provide independent predictions. Although preference for rational processing (as measured by Need For Cognition) is more strongly related to variables such as self-esteem, conscientiousness, and realistic optimism, each

predicts traits on its own, and experiential processing alone predicts belief in the unusual, formal superstition, emotional expressiveness, and agreeableness (Epstein, Donovan, & Denes-Raj, 1999; Pacini & Epstein, 1999).

The role of rational processing. Importantly, people can be directed to approach problems more or less rationally through instructions, which can thus alter responses to well-known decision paradigms (Epstein et al., 1999). Similarly, activation of the rational processing mode predicts non-optimal responses on the Ratio Bias task (Pacini & Epstein, 1999). Demonstrated in a game of chance, where to win one must blindly select a red jellybean from predominantly white jellybeans, but must first choose which of two trays of jellybeans to select from, the Ratio Bias is the tendency to prefer selection of jellybeans from a larger group compared to a smaller group, even when the proportion of winning jellybeans is lower in the larger group (e.g., selecting 7/100 or 1/10). Those scoring higher on a Need for Cognition scale, showing preference for rational processing, demonstrate less bias. The predominant tendency on this task is to respond by relying on the numeracy heuristic—this is highly intuitive, and in this case it is a bias leading to non-optimal responding. The numeracy heuristic is the tendency to simulate the number of ways one could draw a winning response and use only that information to decide which tray to draw from, but respondents should also give consideration to how many ways they might lose. A tendency toward optimal responding is increased when people are encouraged to approach the problem more rationally. When one is encouraged to think more rationally in terms of proportions, the bias is reduced. Further, external motivational influence, such as payment for selecting a winning jellybean diminishes the Ratio Bias effect, as does the individual difference in the tendency to prefer rational

processing. On this task, therefore, rational processing is more influential in changing responses (Pacini & Epstein, 1999).

The effect of increasing rational processing was also demonstrated with the familiar Linda conjunction fallacy. Linda is described as a single, bright, outspoken, 31-year-old woman who majored in philosophy in college, where she was actively involved in issues of social justice. The Linda conjunction fallacy is the tendency to believe that the profile of this fictitious person, Linda, conveys the sense that Linda is more likely to be a feminist bankteller than just a bankteller. According to an axiom of probability it is impossible for both conditions in the former to be more likely than the single condition in the latter, because all feminist banktellers compose only a portion of all banktellers. The researchers argued that violation of the Linda conjunction fallacy is partially attributable to the task's evoking a highly experiential response style. Supporting this, they demonstrated that providing information that directed more rational processing reduced violations of the fallacy, whereas providing information that provoked more intuitive processing increased violations of the fallacy (Donovan & Epstein, 1997; Epstein et al., 1999).

The role of intuitive processing. Partly because CEST emphasizes the results of processing in an experiential mode, it seems logical to apply CEST to an understanding of implicit self-esteem (Epstein & Morling, 1995). Explicit self-esteem may tend to be the product of the rational processing mode, and implicit self-esteem may tend to be the product of the experiential processing mode. Research demonstrates that implicit self-esteem is driven by automatic, associative processes, and lends support to the notion that the experiential processing mode may tend to produce implicit self-esteem. For example,

using a classical conditioning paradigm to repeatedly pair positive stimuli with the self shows that such repeated positive associations can cause an increase in implicit self-esteem (Baccus, Baldwin, & Packer, 2004; Dijksterhuis, 2004a). In addition, the effect has been demonstrated when the stimuli are presented outside of participants' awareness (Dijksterhuis, 2004a). Because implicit self-esteem can be influenced by subliminal classical conditioning procedures, the experiential processing system may produce implicit self-esteem.

Measures of implicit self-esteem lend further evidence that the construct is associative and automatic, and thus related to the experiential processing mode. A number of measures of implicit self-esteem are designed to capture rapid, spontaneous affective reactions to the self, and are based on the assumption that implicit self-esteem consists of automatic evaluations associated with the self-concept (Jordan, Spencer & Zanna, 2003; Bosson, Swann & Pennebaker, 2000). One widely used measure of implicit self-esteem, the Implicit Association Test (IAT) (Greenwald et al., 1998), was designed based on the theory that associations are an important feature of implicit attitudes and thus the use of the associations demonstrates the potential relation between experiential processing mode and implicit self-esteem. Specifically, because the IAT is designed to measure the strength of association between a concept and positive or negative affect, this suggests that implicit self-esteem, as commonly measured (e.g., Greenwald et al., 1998), is closely related to associative, experiential processing (Smith & DeCoster, 2000).

Consistent with the theory that led the development of the IAT, Koole and colleagues argue that implicit self-esteem effects are driven by automatically activated self-evaluation, in the absence of self-reflection (Koole et al., 2001). People like things

that are associated with themselves to a greater extent if they have high implicit self-esteem. This makes anything that is closely associated with an individual relevant to the assessment of their implicit self-esteem. Consistent with this, when people evaluate the initials in their name or the numbers in their birthday positively, this is considered an indication of high implicit self-esteem (Bosson et al., 2000; Pelham et al., 2005). Koole and colleagues, however, show that these effects can be inhibited when people are instructed to devote deep thought to evaluation of letters and numbers, as compared to being instructed to express intuitive feelings about them, the way these preferences are usually measured. From the perspective of CEST, when asked to think hard about the letters, people increase rational processing; when this occurs, people may no longer demonstrate the effect of preferring their own initials and birthday numbers.

In an effort to forge an understanding of the relation between implicit and explicit self-esteem, Koole and colleagues reasoned that if implicit self-esteem is driven by automatic associative processes, such processes would be explicitly expressed unaltered under certain conditions. To test this, the researchers altered the time available for self-report, and measured the correspondence between implicit self-esteem scores and self-report. Inhibiting deliberation through time pressure in one study, and cognitive load in another, caused explicit self-evaluation to match implicit self-evaluation more closely. This showed that people report self-evaluation that is moderately related to their implicit self-esteem when under time pressure or under cognitive load. Higher correspondence between implicit self-esteem and self-reports indicated general agreement between the two self-evaluations, under conditions that prevented the capacity for deliberative

intervention. Implicit self-evaluation may influence self-reports in the absence of motivation or capacity for conscious, effortful processing.

When the capacity or motivation to engage in rational processing is reduced (e.g., through time pressure, or cognitive load), associative, automatic processes related to the experiential processing system become more influential (Koole et al., 2001). Under such conditions, Koole and colleagues observe increased association between implicit and explicit self-esteem, suggesting that explicit self-esteem may come to reflect implicit self-esteem. This suggests that people may be at least partially aware of their implicit self-views. This work suggests two things: Implicit self-views exist within the experiential system, and people may have some awareness of such self-views. This is indirect evidence, however, and our studies are designed to test this possibility more directly.

Awareness of Implicit Self-esteem

Though most definitions of implicit self-esteem assume that people are never aware of their implicit self-esteem, some dual attitude models suggest that implicit attitudes are preconscious, capable of occasionally entering consciousness (Smith & DeCoster, 2000; Wilson, Lindsay, & Schooler, 2000). From one view, for example, when an old attitude is changed the new attitude can override the old, but does not replace it. Instead, the two might coexist as explicit and implicit attitudes (Wilson, Lindsay, & Schooler, 2000). In general, activation of an explicit attitude is capable of overriding an implicit attitude, though the implicit attitude is preconscious; that is, the implicit attitude is available to awareness, and if the explicit attitude does not override its expression, the implicit attitude will be expressed (Wilson et al., 2000). Wilson and colleagues suggest that because implicit attitudes are automatic, they should be activated first, but explicit

attitudes may override implicit attitudes when people have sufficient cognitive resources. Thus they specify that when people do not have the capacity and motivation to retrieve the explicit attitude, they report the implicit attitude. Explicit attitudes that are shown to correspond to implicit attitudes may suggest awareness of implicit attitudes. Implicit self-esteem may be preconscious, generally existing outside of awareness, but capable of momentary awareness (Spencer, Jordan, Logel, & Zanna, 2005). Although operating at an automatic and generally nonconscious level, implicit self-esteem may enter awareness at times. But at what times?

Threat and awareness of implicit self-esteem. Implicit self-esteem may enter awareness through experiences that are self-threatening, having the greatest impact on individuals with high explicit and low implicit self-esteem, because it may negatively contradict their explicit self-views (Spencer et al., 2005; McGregor & Marigold, 2003). For those with consistent explicit and implicit self-esteem, awareness of implicit self-esteem may be inconsequential because it agrees with conscious self-evaluation. By contrast, awareness of implicit self-esteem may influence the behaviour of those with widely discrepant self-evaluations. Because spontaneous awareness of discrepant self-evaluations may lead to a state of tension, such awareness may lead to behaviour aimed at reducing the inconsistent self-views (Spencer et al., 2005). When spontaneous awareness of implicit self-esteem occurs, those with high explicit and low implicit self-esteem are expected to experience implicit self-esteem as nagging doubts, leading to defensive behaviour (Spencer et al., 2005).

Intuition and awareness of implicit self-esteem. Another way that implicit self-esteem might become accessible in consciousness is when the experiential processing

mode is highly active. Examining this possibility is the focus of the present studies. If the experiential processing mode is highly active, this may enable people to attend to visceral feelings or evaluative associations with the self, and incorporate them into their self-reports. This would make sense in light of our understanding of implicit self-esteem. As mentioned previously, implicit self-esteem is affect associated with the self-concept activated automatically when reminded of the self. Thus, perhaps the experiential processing mode heightens attention to such automatic associations. This would then increase the likelihood that such views would be expressed explicitly.

The Present Research

We designed two studies to test whether intuitive processing increases the correspondence between implicit and explicit self-esteem. In the first study we measured whether chronic preference for an intuitive or rational mindset is related to the correspondence between implicit self-esteem and explicit self-esteem. In the second study we examined whether a situational manipulation designed to make intuitive processing more dominant would affect correspondence between implicit self-esteem and explicit self-esteem. The correspondence between explicit self-esteem and implicit self-esteem was taken as an indication that people may be aware of their implicit self-esteem.

Study 1

CEST suggests that the rational and experiential processing modes are dynamic and interacting systems. For any given task (e.g., the Ratio Bias task), the two processing modes interact and the balance between them determines behaviour (Epstein & Morling, 1995). Drawing on this framework, we sought to demonstrate that implicit self-esteem can contribute to explicit reports of self-esteem. The degree to which implicit self-esteem

contributes to explicit self-reports may depend on the use of intuitive processing. People who chronically operate with a highly intuitive mindset may be most aware of their implicit self-esteem, and they may incorporate those associations into self-reports. Those who routinely acknowledge their gut feelings or intuitions may report explicit self-evaluations that are more consistent with implicit self-esteem. Use of the two processing modes has been examined as an individual difference measure in the past (Pacini & Epstein, 1999). Individual differences in chronic use of intuitive processing may be associated with higher correspondence between implicit and explicit self-esteem.

According to CEST, there are individual differences in reliance on both the rational and intuitive systems, and these determine ways of relating to, and interacting with, the world. The tendency to rely on intuitive processing and the tendency to rely on rational processing differ between people and have some interesting correlates. Past research shows females tend to prefer intuitive processing more than males, and that males tend to prefer rational processing more than females (Epstein et al., 1996). Past research also shows that explicit self-esteem is moderately positively associated with a higher tendency to report engagement and ability in rational processing (Epstein et al., 1996). Because research shows that the tendency for rational processing is correlated with explicit self-esteem, controlling for the influence of Need for Cognition on explicit self-esteem in the current study was desirable.

In Study 1, we measured individual differences in intuition to determine if chronic intuitive processing is related to awareness of implicit self-esteem. Participants completed measures of implicit self-esteem, explicit self-esteem, and intuitive processing. The measures were used to examine whether intuitive processing is related to the

correspondence between the two self-evaluations. We reasoned that people who have higher faith in intuition may be more likely to draw on implicit self-esteem in their reports of explicit self-esteem. This would be demonstrated by increased correspondence between implicit and explicit self-esteem. To the extent that this pattern of results is observed, it suggests that people who are highly intuitive are to some extent aware of their implicit self-esteem.

The degree of correspondence between implicit and explicit self-esteem, however, may be a function of the type of self-esteem measure. State self-esteem measures context-specific, momentary feelings. In contrast, trait self-esteem elicits a global, general self-report, that is free of context, and shows stability across time. If people who rely on intuitive processing demonstrate awareness of implicit self-esteem, trait self-esteem may not readily capture the influence of implicit self-esteem on self-evaluation, because the process of reporting global, trait self-esteem may be an inherently rational process requiring abstract thinking and deliberation. As such, it may discourage the use of more intuitive elements in reaching more explicit evaluations. For this reason also, it may not reflect implicit self-esteem, perhaps because it is measured in a rational context, whereas implicit self-esteem is measured in an intuitive context—rapid, associative responses. Some explicit measures may rely less strictly on rational processing—namely, state self-esteem.

Because state self-esteem is more concrete, momentary and context-specific (e.g., Heatherton & Polivy, 1991), it may encourage the use of intuitive feelings and reactions to a greater extent. The state self-esteem scale used in the current studies measures concrete thoughts and feelings in clearly defined domains: performance, social, and

appearance. These aspects of state self-esteem measures may encourage less rational responses, as compared to responses on trait self-esteem measures.

Concrete self-reports may be more closely related to the experiential system than abstract self-reports. The experiential system involves concrete, spontaneous processing, whereas the rational system involves abstract, deliberate, controlled processing (Epstein & Morling, 1995). Explicit self-esteem, like rational processing, is thought to involve abstract, deliberate processing, and implicit self-esteem, like intuitive processing, is thought to involve concrete, associative processing. Within CEST, attitudes of the intuitive system can be inferred from behaviour and emotions. Epstein and Morling proposed that implicit self-esteem can be measured by obtaining a sample of everyday behaviour and emotions. Thus, an early suggestion for a possible measure of implicit self-esteem involved collecting daily reports of events that lowered and raised self-esteem (Epstein & Morling, 1995). This was a context-specific, momentary, and objective procedure, different from self-report measures where questions focus on general impressions. Though it has never been implemented, it is theoretically consistent with the use of state self-esteem, because both measure context-specific, momentary feelings. State self-esteem is thus similar to this early conception of a possible implicit self-esteem measure, but it is different in the sense that it is still an explicit measure. Because the features of state self-esteem include sensitivity to fluctuations in feelings about the self, it might be more readily influenced to be consistent with implicit self-esteem if implicit self-esteem enters awareness.

We believed that people who engage in intuitive processing more often will show evidence of implicit self-esteem in self-reports to a greater extent than those who engage

in intuitive processing less often. In addition, we expected the effect of intuitive processing on self-reports would be more evident for state self-esteem than trait self-esteem. We predicted that with state self-esteem, more than with trait self-esteem, preference for intuitive processing would be associated with higher correlations between implicit and explicit self-esteem.

We also expected that our predicted pattern of results might hold more strongly for females than for males. Some past findings suggest that females show stronger correlations between implicit and explicit self-esteem than do males (Pelham et al., 2005). Pelham and colleagues' findings are at least consistent with the widespread notion of "women's intuition," that females are believed to be more attuned to their intuitions. They argued that implicit and explicit self-esteem are not correlated because most people do not have access to their automatic associations about the self. They argued their results of higher correlations among females occurred because females have greater self-insight than males. They did not test this possibility directly, however, though it is supported by evidence that females report slightly higher faith in intuition, and less need for cognition, than males (Pacini & Epstein, 1999). The current study directly tests whether intuition is associated with increased correspondence between self-evaluations, and whether the effect of intuitive processing would be stronger among females than males in our study.

Method

Participants

Eighty-eight introductory psychology students at Wilfrid Laurier University participated in return for course credit. Because the responses of eight participants on the Implicit Association Test had error rates of 20% or higher, their IAT data were excluded

from the analyses (Greenwald et al., 1998). One score on the state self-esteem scale, the principle outcome variable, was more than 3 standard deviations away from the mean and this outlier was excluded from the analyses.¹ The final sample consisted of 79 participants (64 female, 15 male).

Measures

Need for Cognition. Need for Cognition was measured using a well-established scale (Cacioppo et al., 1984; Cacioppo, Petty, Feinstein, & Jarvis, 1996). This scale measures both how much people enjoy, and believe they are good at, engaging in deep and effortful thought. Items include, “I would prefer complex to simple problems” and “I feel relief rather than satisfaction after completing a task that required a lot of mental effort” (reversed). This scale measures reported ability and engagement in rational processing, and was included in the study because research suggests that deliberative processing overrides associative processes (Epstein et al., 1996; Wilson, Lindsay, & Schooler, 2000). Although intuitive and rational processing may be largely independent, increased rational processing could reduce awareness of implicit self-esteem.

Rational Experiential Inventory. We also administered the Rational-Experiential Inventory (REI) (Epstein et al., 1996), which is designed to measure both rational processing and intuitive processing and is composed of two different subscales, one measuring Need for Cognition, for example, “I have a logical mind” and “I am not a very analytical thinker” (reversed). The other subscale measures Faith in Intuition, which is conceptualized as the ability to use, and engagement in, experiential processing. Sample items for this subscale include, “when it comes to trusting people, I can usually rely on my gut feelings” and “I don’t have a very good sense of intuition” (reversed).

Implicit Association Test. The Implicit Association Test (IAT) was used to measure implicit self-esteem (Greenwald & Farnham, 2000), as modified by Jordan, Spencer, and Zanna (2003). The IAT is a computer-based response mapping task that measures the degree of association between the self-concept and positive and negative affect. Participants categorize words that belong to one of two categories: (1) pleasant versus unpleasant words (e.g., cockroach, holiday), and (2) self versus not-self words (e.g., me, it). During the two critical blocks of trials participants make both of these categorizations, on alternate trials, using only a single set of response keys. In one critical block, pleasant and self share a single response (whereas unpleasant and not-self share another); in the other critical block, pleasant and not-self share one response. A person with high implicit self-esteem (i.e., a strong association between the self and positive affect) should be faster to respond to when self and pleasant share a response than when self and unpleasant share a response, because the positive affect associated with the self should interfere with the processing of unpleasant words in the latter (but not the former) condition. Average response times during the block in which self and pleasant share a response are subtracted from average response times during the block in which self and unpleasant share a response to create an index of implicit self-esteem, with higher scores indicating higher implicit self-esteem. Thus the implicit self-esteem score is a difference score between the average response times of correct responses on self-pleasant, congruent trials, and the average response times of correct responses on self-unpleasant, incongruent trials.

State self-esteem. Participants also completed a measure of state self-esteem (Heatherton & Polivy, 1991). This scale includes various questions about mood and self-

feelings in the moment, in three broad domains: social, appearance, and performance. Sample items for this scale include, “I feel confident about my abilities” and “I feel inferior to others at this moment” (reversed).

Trait self-esteem. The Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965) was used to measure explicit trait self-esteem. This scale contains items such as, “I feel that I’m a person of worth, at least on an equal basis with others” and “All in all, I am inclined to feel that I am a failure” (reversed).

Procedure

Although up to eight students were allowed to participate at a time, participants completed questionnaires and computer tasks at individual workstations. Participants were invited to complete a “perceptual styles study.” Upon arrival they were asked to complete the Need for Cognition scale and Rational Experiential Inventory. When they completed these, they were asked to read the instructions for the next task, which was on the computer, and to begin the program when ready. At this time they completed the IAT measure of implicit self-esteem. Following this task, participants were given the state and trait self-esteem scales to complete. When they finished these they were given a thorough debriefing.

Results

Consistent with past research (Pacini & Epstein 1999), gender differences were found in need for cognition using the 12 item subscale from the REI scale, $\beta = .21$, $t(85) = 1.99$, $p = .05$, such that males ($M = 3.79$, $SD = .48$) reported more capability and preference for rational thinking than did females ($M = 3.49$, $SD = .62$). To measure Faith in Intuition, we examined the 12 items from the REI scale (Pacini & Epstein, 1999).

Consistent with Pacini and Epstein (1999), females reported more faith in intuition ($M = 3.50$, $SD = .58$) than males ($M = 3.40$, $SD = .50$), although this difference was not significant, $\beta = -.09$, $t(85) = -.85$, *ns* (see Table 1).

We expected higher correlations between the measures of explicit self-esteem and implicit self-esteem for those who prefer an intuitive processing mode. To test this prediction, we conducted a multiple regression analysis in which state self-esteem was predicted by implicit self-esteem, faith in intuition, gender, and their interaction terms. The full Need for Cognition scale was included in the analysis as a control variable.² We found a marginally significant gender by intuition by implicit self-esteem interaction in predicting state self-esteem, $\beta = -.20$, $t(70) = -2.59$, $p = .069$. To probe this interaction, we examined the interaction between implicit self-esteem and faith in intuition for males and females separately. This analysis showed that the interaction was not significant for males, $\beta = -.04$, $t(70) = -.22$, *ns*, but was significant for females, $\beta = .36$, $t(70) = 2.98$, $p = .004$.

To explore this interaction for females we tested the relation between implicit self-esteem and state self-esteem for females who were high in faith in intuition (+1 SD) and low in faith in intuition (-1 SD), which would allow us to determine whether high intuition affects correspondence between the self-evaluations. This analysis showed that the relation between implicit self-esteem and state self-esteem was not significant for females who were low in faith in intuition, $\beta = -.26$, $t(70) = -1.53$, $p = .13$, but was significant for females who were high in faith in intuition, $\beta = .43$, $t(70) = 2.65$, $p = .01$. This showed that as faith in intuition increases among females, correspondence between implicit self-esteem and reports of state self-esteem also increase (see Figure 1). Thus on

a self-report scale females indicated state self-esteem that reflected implicit self-esteem to a greater extent when they also reported a preference for and enjoyment of intuitive processing. The basic effect of the gender and implicit self-esteem interaction in predicting state self-esteem was not significant, $\beta = .01$, $t(73) = 0.06$, *ns*, indicating that we did not replicate the past finding that females generally have higher correspondence between implicit and explicit self-esteem than males.

None of the effects were moderated by trait self-esteem. Neither were any of the analyses reported above significant when trait self-esteem was examined instead of state self-esteem, all $ps > .10$. This is consistent with the hypothesis that the self-report measures would have differential correspondence to implicit self-esteem depending on how the self-report measures relate to the experiential system. We found that with state self-esteem, but not with trait self-esteem, preference for experiential processing mode was associated with higher correlations between the self-evaluations.

Discussion

Faith in intuition was associated with reports of state self-esteem that were more consistent with implicit self-esteem, at least for females. Correspondence between implicit and state self-esteem may suggest that implicit self-esteem influenced reports of state self-esteem, suggesting that some people are aware of their implicit self-esteem. This suggests that some people may either be aware of their implicit self-esteem or report awareness of implicit self-esteem more than others. Implicit self-esteem seems to be accessible to those who put more faith in intuition. This is meaningful given that most theorists assumed that people are not aware of their implicit self-esteem. Knowing when and why implicit and explicit self-esteem correspond may serve as a first step to

understanding how implicit self-esteem might inform people's explicit self-evaluations. It may also help us better understand what an implicit attitude is.

The results suggested that females but not males had greater correspondence between implicit and explicit self-esteem if they had high faith in intuition. This finding has failed to replicate past research that has demonstrated higher correspondence between implicit and explicit self-esteem for females than males when measuring implicit self-esteem using various implicit measures (Pelham et al., 2005). In the current study, although the effect with gender was marginal, and there were relatively few males in the study, it seems as though the effect is stronger for females than for males. Faith in intuition did not differ significantly in the present sample but has been shown to be stronger for females in other studies (Epstein et al., 1996). If females are more adept at intuitive processing than males (Pelham et al., 2005), this is somewhat consistent with research indicating that increasing nonconscious processing of males improves their decision-making in situations where effortful reasoning is less optimal for decision-making (Dijksterhuis, 2004*b*). This research examined decision-making in situations where relying on non-deliberative thinking was beneficial. The researchers asked participants to complete decision tasks where they chose between several options with many attributes. They manipulated whether or not participants were given an opportunity to deliberate over the options or not and part of their analyses revealed that decision-making was improved for males when their ability to deliberate about the decision was impeded, perhaps forcing them to rely more on their non-deliberative thinking. Further, females outperformed males overall on such tasks, suggesting that use of intuition among females may be generally stronger than among males (Dijksterhuis, 2004*b*).

The design of the current study was correlational and therefore our interpretation of these findings is limited. Further research that directly influences intuitive processing may reveal whether intuition has a direct influence on the correspondence between implicit and explicit self-esteem. Future research might also show why the effect of intuition on correspondence of self-views is greater among females, and whether situations that heighten reliance on intuition will affect the gender difference.

In a subsidiary analysis of the data, we looked more closely at the Faith in Intuition scale. Faith in Intuition has two subscales, one measuring intuitive ability, and the other measuring engagement in intuition (Pacini & Epstein, 1999). Experiential ability refers to reports of a high level of ability in forming accurate and reliable impressions and feelings, whereas experiential engagement refers to reliance on and enjoyment of feelings and intuitions when making decisions. Although scale validation has revealed both subscales are highly similar in their associations with personality variables and beliefs, there are some clear differences (Pacini & Epstein, 1999). For example, experiential ability, but not engagement, is positively related to overall favorable beliefs about the self, conscientiousness, and belief in a personally directed and controllable world, and is negatively related to neuroticism. Experiential engagement, but not ability, is positively related to openness to experience, agreeableness, and emotional expressivity, and is negatively related to categorical thinking (i.e., polarized thinking, distrust of others, intolerance). Although we had no predictions about how ability versus engagement might contribute to the findings in the current study, we were interested in whether one or the other would emerge as more responsible for the demonstrated effect of high intuition on self-report. To test whether one or the other subscale was responsible

for the reported effect, we examined the subscales individually. The interaction effect of gender, implicit self-esteem and intuitive *engagement* (6 items; Chronbach's $\alpha = .78$) was not significant, $\beta = -.19$, $t(70) = -1.64$, $p = .105$, but the interaction effect of gender, implicit self-esteem and intuitive *ability* (6 items; Chronbach's $\alpha = .78$) was significant, $\beta = -.25$, $t(70) = -1.99$, $p = .05$. This suggests that ability to reliably use experiential processing may be more responsible for correspondence between implicit and explicit self-esteem. Though possible differences between these subscales may be a direction for future research, the amount of difference between these subscales may not be meaningful.

On a chronic basis some people have high faith in intuition, but people may demonstrate correspondence between their implicit and explicit self-esteem when they are in situations that lead to a heightened intuitive mindset. People may be more or less intuitive across situations, influenced by properties of a task, or motivated to devote differential energy to one mode or the other. Although few situations require purely one mode without the other, some situations may cause a dramatic shift to highly intuitive processing (Epstein & Morling, 1995). Such experiences that lead to reliance on experiential processing may momentarily increase accessibility of implicit self-esteem. To test whether intuition causes the correspondence between implicit and explicit self-esteem, in Study 2, we sought to put participants in a situation that lead to either a more rational or intuitive mindset.

Study 2

The design of Study 1 was correlational. To complement Study 1 we conducted an experiment in which we induced people to adopt a relatively intuitive or rational mindset. Study 1 examined dispositional differences in awareness of implicit self-esteem,

and in Study 2 we manipulated mindset in order to directly test whether an intuitive mindset causes increased awareness of implicit self-esteem.

To determine whether an intuitive mindset can make people more aware of implicit self-esteem, we first sought to develop a method to influence mindset. Epstein and colleagues (1996) have had some success in the past influencing decisions by manipulating rational or experiential processing. However, there has not yet been a generalized manipulation of the intuitive mindset. The manipulation of processing that Epstein and his colleagues have used to influence decision-making was contained directly in the instructions of the decision tasks themselves. For example, after reading a vignette describing a man who was late for a flight, some participants were asked to report how foolish they thought the man felt, which framed their judgment as an intuitive task, and others were to report how a completely logical person would react, which framed their judgment as a rational task (Epstein et al., 1996). After reading the vignette about a missed flight most people engage in counterfactual reasoning where they mentally undo the event imagining if the person had arrived on time, and a near miss is easier to imagine turning out better. In this way, being late for a flight evokes a stronger emotional response if the person nearly made it than if there was little chance of making it on time. That is, if it was a close call a counterfactual response results in a stronger experience of the event as regrettable. Participants making judgments framed with a rational perspective demonstrated this effect less, showing that as people's mindsets shift, so does their perspective of the event.

In addition, researchers have found that the dominant response on some tasks is experiential, for example, the Ratio Bias task (Pacini & Epstein, 1999). As mentioned,

most people approach the Ratio Bias task more intuitively, through the numeracy heuristic, so differences in rational processing (i.e., Need for Cognition) are most influential in altering typical responses. Self-reports of self-esteem, in contrast, are usually relatively deliberate responses, and may thus be determined primarily by rational processing. In this case, intuitive processing may be more influential in altering typical responses. Therefore, we sought a general manipulation of mindset that could be extended beyond a single decision task so that we could observe the effects of mindset on self-evaluations. To manipulate mindset, we gave instructions that encouraged either a rational or intuitive mindset.

Participants were invited to a study ostensibly concerning decision-making. We explained to participants the difference between a rational and an intuitive approach to making decisions, and told them that reliance on one mode of decision-making over the other has been shown to predict success in life. This was intended to motivate either predominantly rational or predominantly experiential responding. They were then asked to make a series of decisions using the specified strategy, for which they read personality profiles of various individuals and decided for each person whether they would live with that person or not. According to the cover-story, their decisions about each potential roommate would be used to assess their ability at deciding with the specified decision making style. We were not concerned with the decisions made, but with the subsequent self-evaluations following the manipulation. We sought to affect participants' mindset by motivating participants to make repeated judgments guided by one or the other mindset, to test whether this would influence their subsequent self-evaluations.

We expected implicit self-esteem would correspond more closely to explicit self-evaluations when people were engaged in intuitive processing. We expected the effect to depend on the kind of explicit measure used. According to CEST, the relative dominance of a rational or intuitive mindset is influenced by the situation, such as the nature of a task (Epstein & Morling, 1995). The rational system is deliberative, controlled, and effortful, whereas the experiential system is more affective, efficient, and effortless (Epstein & Morling, 1995; cf. Smith & DeCoster, 2000). Questionnaires are deliberative and controlled, which suggests that responses to them will typically be based more on rational processing than experiential processing. We predicted that the correspondence of explicit measures with implicit measures would depend on the properties of the explicit task, such that the less rational processing was required for explicit task completion, the more correspondence between the self-evaluations would be enabled to emerge.

Although state self-esteem showed correspondence between implicit and explicit self-views in Study 1, this effect may have reflected the influence of habitual faith in intuition. For people who are more accustomed to using a predominantly rational mindset, but who are situationally induced to adopt an intuitive mindset, state self-esteem may not capture awareness of implicit self-esteem. To capture the influence of implicit self-esteem on explicit self-esteem may require a scale that is even less deliberative. Just as in Study 1 state self-esteem was less deliberative than trait self-esteem, to capture the influence of temporary intuitive processing, we sought a measure that was less deliberative still. We thus developed a measure of explicit self-evaluations that relies even less on rational processing. Some evidence suggests that having people make trait judgments under time pressure is an effective way to measure self-evaluation that can

more closely reflect implicit self-esteem (Koole et al., 2001). We developed a speeded self-evaluation task that requires fast responses to positive and negative trait words, reducing deliberative responding. Though state self-esteem is a less deliberative measure than trait self-esteem, as argued in Study 1, the state self-esteem scale still allows deliberation over responses in the sense that people can take as long as they want for its completion. Nevertheless, in completing the state self-esteem scale participants may use the rational mindset more than on the speeded self-evaluation task, which reduces the opportunity for deliberation. Compared to speeded self-evaluations then, we expected responses on the trait and state self-esteem scale to be more deliberative, engaging rational processing to a greater extent. Intuitive processing is more compatible with the speeded self-evaluation task and this task was expected to capture the correspondence between implicit and explicit self-esteem among those in a temporary intuitive mindset. Because it incapacitates overriding influences by the rational system (cf. Wilson et al., 2000), the speeded self-evaluation task is a valuable way to assess self-evaluations that capture experiences that participants might not report under a more deliberative response format.

We sought to manipulate whether people made decisions with a rational strategy or an intuitive strategy and then measure the influence this has on correspondence between implicit and explicit self-esteem. We predicted that when intuitive processing was increased this would lead to self-reports that reflect implicit self-esteem to a greater extent.

The purpose of the study was to cause some participants to temporarily adopt an intuitive processing style and then to have them complete measures of self-evaluation.

We used a speeded self-evaluation task as an outcome measure to capture changes in self-evaluation under time pressure. If speeded self-evaluation correlates with implicit self-esteem for people in an intuitive mindset, it would provide evidence that implicit self-esteem may influence judgments to a greater extent in this mindset. We were also interested in whether gender would be important for the relation of implicit and explicit self-esteem, replicating the finding from the previous study.

Method

Participants

Sixty-two introductory psychology students at Wilfrid Laurier University participated in return for course credit. Three participants' Implicit Association Test scores were excluded from the analyses because they had error rates of 20% or higher. One participant's responses on the speeded self-evaluation task were not recorded due to a technical failure. The sample consisted of the remaining 58 participants (18 males, 40 females).

Measures

Implicit self-esteem. In order to measure implicit self-esteem, we had participants complete the IAT measure of implicit self-esteem, as in Study 1.

Need for cognition. Participants also completed the Need for Cognition scale. It was measured to account for preexisting differences in chronic reliance on a rational mindset. Measuring Need for Cognition allowed us to control for its influence in our analyses (cf. Cacioppo et al., 1996).

Explicit trait self-esteem. The Rosenberg Self-esteem Scale was included as a measure of explicit self-esteem, as in Study 1.

Speeded self-evaluation task. In order to measure non-deliberative self-evaluation under time pressure, participants completed a computer-based task in which positive and negative trait words are presented sequentially on the computer screen. As each trait appears, participants indicate whether each word is self-descriptive by responding to keys marked, “does not describe me,” “somewhat describes me,” “describes me,” or “describes me very well.” Participants were required to respond to each trait word in less than one second. Initially, participants completed eighteen practice trials allowing them to become familiar with the task, the traits presented were neutral in terms of social desirability and participants were allowed to make the categorizations without time pressure. The traits were: funny, modern, musical, loyal, unique, unusual, responsible, progressive, traditional, conventional, precise, formal, determined, insistent, composed, steady, tough, and principled. In the subsequent 29 trials, participants were required to respond within one second of the word appearing on the screen. If participants took longer than one second to respond, the task was interrupted while a message appeared on the screen encouraging faster responses. These trait words were again neutral in terms of social desirability, they were: lucky, daring, subtle, objective, sentimental, quick, serious, religious, fashionable, candid, comical, persistent, orderly, artistic, deliberate, calm, moral, casual, romantic, innocent, idealistic, conservative, practical, unpredictable, assertive, efficient, decisive, logical, and curious. These trials preceded the manipulation. The test trials for the speeded self-evaluation task followed the manipulation, and again required responses in less than one second, beginning with ten trait words from the previous list, but then presenting twenty traits that were more highly evaluative and clearly related to self-evaluation. Unlike the practice trials, during these test trials

participants did not receive feedback even if responses took more than one second in order to allow the test trials to continue without interruption. Responses to these twenty traits were recorded and comprised the speeded self-evaluation scores. The trait words were: confident, secure, assured, adequate, likeable, certain, decent, good, acceptable, satisfactory, incompetent, inadequate, flawed, average, useless, insecure, uncertain, uneasy, unsettled, and discouraged. We assigned values to the endorsement of the traits, ranging from 1 to 4, corresponding to “does not describe me” and “describes me very well” and we reversed the scores for negative traits. For each individual the twenty items were averaged, and higher scores indicated more positive self-evaluations. In the instructions, we required participants to respond in less than one second to each trait word, but in scoring the responses, we deleted any responses with times more than 1300 ms or less than 300 ms. Speeding up the required response time eliminated deliberative control through executive intervention. However, the evaluations were still explicit in the sense that participants were aware that they were making direct judgments of themselves.

State self-esteem. State self-esteem includes various questions about mood and self-feelings in the moment, in three broad domains: social, appearance, and performance. It was included in the current study, as in Study 1.

Rational Experiential Inventory. The REI was included with revised instructions to indicate how they felt at that moment, rather than how they generally feel. Participants were asked, “please answer according to how you feel right now at this moment. Do not worry about what you are generally like or how you might have felt in the past” (see Appendix B). We used this as a manipulation check, to determine whether condition

influenced either processing mode. The instructions asked for feelings, beliefs, and behaviours in the moment, but otherwise was the same as in Study 1.

Procedure

After consenting to participate, participants completed the IAT measure of implicit self-esteem, followed by the NFC scale and the RSES. This was followed by a series of practice trials on the speeded self-evaluation task, first introducing the response keys, and then introducing speeded responding. When participants finished the practice trials the experimenter gave them instructions for the decision task, which was the manipulation of mindset.

To manipulate mindset, participants were asked to make decisions either in an experiential mode or in a rational mode. The experimenter gave participants the same instructions, which varied depending on condition. Half of the participants were assigned to the Intuitive condition and were told that intuitive decision-makers succeed in life. The other half were assigned to the Rational condition and were told that rational decision-makers succeed in life. They were told that there are generally two ways that people make decisions:

When people need to choose between two courses of action, or between buying one of two products, for example, they can basically approach the problem in one of two ways. They can approach the decision in a deeply thoughtful manner, being logical and rational—they may, for example, carefully weigh the pros and cons of each option before making a decision. On the other hand, they can rely on their gut feelings, using their intuitions to make a quick decision based mainly on how they feel about

the options...There is clear evidence that people who adopt a [rational/ intuitive] approach to decision making are more successful in many areas of their lives. In business, people who [rationally weigh pros and cons/ can make quick decisions based on their instincts] make better decisions, and perform better in management and executive positions. They are also more popular socially in the workplace. Interestingly, people who adopt a [rational/ intuitive] approach also tend to be more successful in romantic relationships, being less likely to divorce if they are married. They are also more likely to be identified by others as community leaders. In many different ways, [rational/ intuitive] people seem to excel.

In the present study, we are interested in understanding why [rational/ intuitive] people are more successful than [intuitive/ rational] people. We first want to see how well you can make decisions [rationally/ intuitively]. The task you are about to perform can be completed either rationally or intuitively, but we would like to see how well you do it by focusing on being [rational/ intuitive].

Participants were then informed that they would see a series of descriptions of different people on the computer screen and that they were to imagine living in a co-ed house with several other people and looking for someone to move in to fill an empty room. They were asked to make a decision for each person they read about whether they would choose to live with that person or not, using their assigned decision-making system. Those in the Rational condition were asked to read each profile completely and write

down every consideration that occurred to them in the decision process, indicating its importance and the reason for its importance. They were encouraged to make a list of pros and cons. Those in the Intuitive condition were asked to read each profile completely and use gut feelings to make a decision, relying on intuitions and how they felt about the individual based on his or her description. They were asked to work quickly and to try not to think too much about their decisions.

Each participant then saw seven fictitious personality profiles (see Appendix B), with accompanying pictures, presented one at a time on the computer monitor. For each profile the participant made a choice to either accept or reject the person and then moved on to the next profile. The profiles were designed to include information that is likely central to the decision (for example, agreeableness, financial situation, responsibility) as well as information that might affect impressions of the target but was not overly relevant to whether they would be a good housemate (for example, hobbies, tastes in movies, career aspirations). In other words, each profile offered participants clearly relevant information, but also stated information that was less clearly relevant to the decision. For example, one profile indicated that “Trent” is agreeable, a trait relevant to the decision, and that he likes bowling, which reveals little about the kind of roommate he might be. In this way, the task included information that could affect the impression but might not be considered a rational basis for making a decision. Although the instructions were relevant only to the decision task, condition was expected to influence mindset beyond the decision task itself, so that the effects of intuitive processing would carry over into the subsequent tasks.

Immediately following their decisions on the seven fictitious personality profiles, participants completed the speeded self-evaluation task. Lastly, participants completed the measure of state self-esteem, and the Rational-Experiential Inventory with the revised instructions. This was followed by a thorough debriefing during which the experimenter divulged the true purpose of the study and discredited the notion that one mode predicts greater life success than the other.

Results

To determine whether the manipulation of mindset had the desired effect, we tested to see whether the manipulation affected Faith in Intuition and Need for Cognition. Participants in the Intuitive condition ($M = 3.7$, $SD = .56$) showed more faith in intuition than those in the Rational condition ($M = 3.3$, $SD = .79$), $\delta = 3.11$, $t(59) = -2.1$, $p = .041$. However, Need for Cognition scores in the Rational condition ($M = 3.65$, $SD = .67$) did not differ from the Intuitive condition ($M = 3.77$, $SD = .58$), $\delta = 1.05$, $t(59) = .72$, ns . This manipulation check suggests that our manipulation effectively altered intuition alone. However, a pre-measure might have allowed this conclusion with greater certainty.

The speeded self-evaluation task showed adequate reliability (Cronbach's $\alpha = .82$) and correlated with state self-esteem, $r(60) = .55$, $p < .001$, and trait self-esteem, $r(60) = .60$, $p < .001$, suggesting that the speeded self-evaluation reflects explicit self-esteem (see Tables 3 & 4). In order to test whether speeded self-evaluations were more closely associated with implicit self-esteem in the Intuitive condition, the data were submitted to a multiple regression analysis in which implicit self-esteem and condition (coded such that rational = 1, experiential = -1) were included as well as the interaction between them, in predicting the speeded self-evaluation. Need for Cognition was

included as a control variable.² We expected to find greater association between implicit self-esteem and speeded self-evaluations for participants in the Intuitive condition. This prediction would be supported if condition showed differential correlations between implicit self-esteem and speeded self-evaluations. In order to test whether gender moderates the relationship between condition and the correspondence between implicit and explicit self-esteem, we included gender and its interaction terms. In predicting speeded self-evaluation, the interaction of gender, condition, and implicit self-esteem was not significant, $\beta = -.04$, $t(49) = -.25$, *ns*, revealing that gender did not moderate the predicted effect. Further, there were no significant main effects or interaction effects in this analysis. Gender did not appear to be important in predicting the correspondence between implicit and explicit self-esteem, though it was in Study 1.

We then conducted the analysis excluding gender. The interaction of condition and implicit self-esteem predicted responses on the speeded self-evaluation task, $\beta = -.28$, $t(53) = -2.35$, $p = .023$. A simple slope analysis revealed that the correspondence between implicit self-esteem and responses on the speeded self-evaluation task was significant in the Intuitive condition, $\beta = .55$, $t(53) = 3.04$, $p = .004$, but not in the Rational condition, $\beta = -.02$, $t(53) = -0.10$, $p = .92$, suggesting that those in the Intuitive condition showed more awareness of implicit self-esteem (see Table 5). This interaction indicated a higher correlation between the measure of speeded self-evaluation and implicit self-esteem for those in the Intuitive condition compared to those in the Rational condition (see Figure 2).

State self-esteem was submitted to the same analysis, and the interaction and main effects were non-significant, all $ps > .10$. Trait self-esteem did not moderate any of the

effects, which is consistent with the idea that properties of self-report measures determine the degree of rational and experiential processing while responding, and that the traditional, deliberative scales may require increased rational processing for responding.

Discussion

When people were encouraged to adopt a more intuitive mindset, their self-evaluations corresponded more closely to their levels of implicit self-esteem. An intuitive mindset increased the correspondence between implicit self-esteem and explicit self-esteem on the speeded self-evaluation task.

The speeded self-evaluation task corresponded with implicit self-esteem, when people were in an intuitive mindset, but state self-esteem did not. The absence of an interaction effect of condition and implicit self-esteem in predicting state self-esteem is consistent with the idea that some responses are more likely to draw on rational processing, and preclude intuitive processing. This then limits the extent to which implicit self-esteem can be expressed in explicit responses. Though in Study 1 we found that state self-esteem corresponded with implicit self-esteem among those reporting habitual Faith in Intuition, this was not found in the current study when an intuitive mindset was temporarily induced. Perhaps a stronger manipulation or a different order of the scales would show a similar relation between implicit self-esteem and state self-esteem. An interesting direction for further research might be examining how intuition increases correspondence between of implicit self-esteem and self-reports.

General Discussion

Across two studies, we found that the relation between implicit and explicit self-esteem is higher among those who rely more on intuition. In Study 1, it was shown that

state self-esteem correlates more highly with implicit self-esteem for those who place more faith in intuition. In Study 2, speeded self-evaluation correlated with implicit self-esteem among those who were temporarily induced to adopt an intuitive mindset. Our preferred interpretation of these findings is that an intuitive mindset encourages awareness of implicit self-esteem which is then more likely to influence reports of self-esteem. To the extent that reports of self-esteem are influenced by implicit self-esteem, this should increase the correspondence between the two. These findings seem to challenge the prevalent assumption in the implicit attitudes literature that people are not aware of their implicit self-esteem (e.g., Greenwald & Banaji, 1995; Greenwald & Farnham, 2000; Spalding & Hardin, 1999).

A limitation of this research is that the effect of intuition on correspondence between implicit and explicit self-esteem emerged selectively among the various measures used. This is particularly problematic if this is evidence that the state self-esteem scale is less explicit than trait self-esteem, and the speeded self-evaluation task less explicit still. However, these scales can be considered explicit in the sense that people are aware that they are making judgments about themselves. In the speeded self-evaluation task participants may still control responses but use less deliberation. This may reduce motivated overriding of evaluations. Motivated overriding of evaluations, for example, when someone has negative self-views but reports otherwise, may require time and mental resources to occur (Wilson et al., 2000). Evidence that reducing deliberation reduces motivated overriding would support the explicit nature of the measure. For instance, through future research we may test whether removing the time pressure from the speeded self-evaluation task allows defensiveness such as motivated overriding to

emerge. For now we point to the overall correlations between the three measures, trait self-esteem, state self-esteem, and speeded self-evaluation, as evidence that these three differentially access a unified construct—namely, explicit self-esteem.

Both studies seemed to reveal a pattern that showed the greatest concordance in self-reports was among those with high implicit self-esteem, influencing the explicit rating to be more positive. The pattern of results suggested that intuitive people with low implicit self-esteem did not report lower self-esteem than those who were less intuitive. However, those with high implicit self-esteem reported more positive self-views when they were relatively intuitive in their mindsets. The lack of more negative reports among those with low implicit self-esteem is curious. Perhaps awareness of low implicit self-esteem is not ordinarily experienced as negative. Early research on implicit self-esteem revealed that most people like things that are associated with themselves, suggesting that in general people have fairly high implicit self-esteem (Greenwald & Banaji, 1995). If so, then when implicit self-esteem comes into awareness it may make sense that people express more positive self-views, on average. Alternately, further research may explore whether this finding is due to defensiveness. That is, perhaps those with low implicit self-esteem that comes into awareness are motivated to report more positive self-views.

Intuition and Gender. The findings in Study 1 suggest that faith in intuition is associated with closer correspondence between implicit and explicit self-esteem more for females than for males. This is consistent with past findings that females generally show stronger correlations between implicit and explicit self-esteem than do males (Pelham et al., 2005). Pelham and colleagues' findings suggest that females have higher correlations between implicit and explicit self-esteem. These findings have not been shown with the

IAT measure of implicit self-esteem, and the current findings failed to replicate the general result of their research. However, the current research might suggest more clearly why females demonstrate greater correspondence of implicit and explicit self-evaluations. That is, in Study 1 only females with high faith in intuition had implicit self-esteem that corresponded with explicit self-esteem. The widespread notion of “women’s intuition” that females are more attuned to their intuitions seems to have received some support in Study 1, in the sense that predominately intuitive females but not males gave self-reports of implicit self-esteem. From this perspective, it is still unclear why some males reported high intuition but did not show the correspondence between implicit and explicit attitudes. Perhaps there was a difference in how males and females interpreted the questions on the Faith in Intuition scale, such that males approach the questions on the scale with a different reference point than females. There is some evidence that females perform better than males when decision-making with nonconscious processing is optimal, and that in such situations males’ decision-making improves greatly from a manipulation designed to induce unconscious thought (Dijksterhuis, 2004*b*). This is broadly consistent with the findings in Study 2. This study showed the effect of heightened intuition caused self-reports to correspond with implicit self-esteem and did not differ between males and females, which suggests both males and females can adopt a relatively intuitive mindset. Although a gender difference appeared to moderate the effect of chronic intuition on correspondence of implicit self-esteem with state self-esteem, it should be noted that there were only a small number of males in Study 1, and so this gender difference should be interpreted with caution.

Future research might examine whether the influence of intuition on verbal reports occurs for all implicit attitudes. For example, research with implicit prejudice might show whether those who think intuitively are more likely to report attitudes towards an ethnic group that correspond more closely with implicit measures of prejudice toward the ethnic group. This would be of great interest if inducing intuitive thinking makes people more aware of implicit attitudes, in general.

The influence of intuition on awareness of implicit self-esteem. Given the results of Study 2, why do people give self-reports that more closely reflect their implicit self-esteem when they are highly intuitive? There may be two distinct memory systems that influence feelings, thoughts, and behaviour (Smith & DeCoster, 2000). These two systems are conceptually related to the rational and experiential systems of CEST, the relative use of which may differ between people and across situations. If these systems use different ways of relating to, understanding, and responding to the world, not only the types of information that they store could differ, but also the way that the information is processed (Smith & DeCoster, 2000). Recall that some theorists have argued that implicit attitudes are preconscious and sometimes enter awareness (Wilson et al., 2000). Given the perspective that these systems are distinct, there are two plausible explanations for why heightened intuition leads to greater correspondence between implicit self-esteem and reports of self-esteem. First, intuition may increase awareness of implicit self-esteem. Second, people may already be generally aware of implicit self-esteem but require an intuitive mindset to express it.

According to the first explanation, intuition may lead directly to awareness of implicit self-esteem. For example, perhaps intuitive processing allows attention to

associative thoughts and feelings. If people become aware of implicit self-esteem through intuition, this suggests that chronic reliance on intuition leads to somewhat more accessible implicit self-esteem that serves as a source of self-relevant information. This does not rule out the possibility that implicit self-esteem may enter awareness in other ways that are independent of an intuitive mindset (e.g., Spencer et al., 2005).

According to the second perspective, people are generally aware of implicit self-esteem, and are enabled to report it when relying on intuitions. If people are already aware of their implicit self-esteem and an increased focus on intuition leads them to give self-reports that reflect their implicit self-esteem, why does reliance on intuition lead people to use this information in their self-reports? Why might the experiential processing mode make people express views that are more in line with their implicit attitudes? One possibility is that intuitive processing induces people to identify their implicit self-esteem as something that is important and give it more credence as part of their self-views. People may already experience the evaluative associations of implicit self-esteem, but only in an intuitive mindset endorse these feelings, or deem them relevant, when reporting self-views. Perhaps operating with high faith in intuition leads to greater verbal access of associations.

This interpretation is consistent with Smith and DeCoster's (2000) description of the relation between rule-based processing (i.e., rational system) and the fast- and slow-learning systems. They explain that rule-based processing accesses both the fast- and slow-learning systems through human linguistic abilities. Associative, intuitive processing is thought to be preverbal, not relying on words or other symbolically represented knowledge for encoding. Because the fast- and slow-learning systems

interact, when the balance shifts to highly associative processing, linguistic access of associative information may increase (Smith & DeCoster, 2000). This may give implicit attitudes some influence over self-reports. Even if implicit self-esteem is preconscious, and enters awareness, it may nonetheless require highly intuitive processing to gain a verbal outlet. Articulation of implicit self-esteem may only occur if the (rule-based) rational system gains linguistic access to the (associative) intuitive system (Smith & DeCoster, 2000), through an intuitive mindset. Then it seems plausible that use of intuition may influence self-reports to draw more heavily on associative, implicit knowledge. Further research is needed to specify more clearly how intuition increases the correspondence between implicit self-esteem and self-reports of self-esteem.

In the present studies, intuition was more important than rational processing in promoting correspondence between implicit self-esteem and self-reports of self-esteem. Intuitive processing might be more important in this case because reporting self-esteem may generally entail highly rational processing, particularly when reporting trait self-esteem. This is consistent with the fact that there is typically no correlation between implicit and explicit self-esteem (Greenwald & Banaji, 1995; Jordan et al., 2003; Pelham et al., 2003). This may also help to explain why different self-report measures showed effects to different extents in the studies. In Study 1, state self-esteem captured the predicted correspondence between implicit and explicit self-esteem, but trait self-esteem did not. In Study 2, speeded self-evaluations capture this correspondence, but neither trait nor state self-esteem did so. In contrast to the relative unimportance of rational processing compared to intuition in the context of the current studies, rational processing may make more of a difference in situations where intuition is more prevalent (e.g.,

Pacini & Epstein, 1999; Epstein et al., 1999). If in such situations where intuition is more prevalent people move from an intuitive to a more rational mindset, this could lead to greater discrepancies between implicit and explicit self-esteem.

Although correspondence of self-evaluations may reflect awareness of implicit self-esteem, it is unlikely that all people with consistent explicit and implicit self-esteem are chronically aware of their implicit self-esteem, nor are those with conflicting self-views free from fleeting awareness of implicit self-esteem. Instead perhaps people occasionally experience momentary awareness of implicit self-esteem, even those with conflicting implicit and explicit self-esteem. Those who engage in highly intuitive processing are more likely to report feelings generated by implicit self-esteem, suggesting that they are aware of implicit self-esteem. How they respond to the awareness may depend on whether implicit and explicit self-esteem agree or not. Those with explicit and implicit self-esteem that correspond may subjectively experience a unified self-view whether they are aware of implicit self-esteem or not. On the other hand, those with explicit and implicit self-esteem that disagree may subjectively report their implicit self-views when their thinking is highly intuitive, but may engage in efforts to reduce their dissonant feelings. Because being intuitive can lead to awareness of implicit self-esteem, those who are motivated to avoid such awareness may actively seek to restore a more rational mindset.

Motivation. So far, we have focused on the influence of *cold* cognitive processes on discrepancy between implicit and explicit self-esteem, but *hot* cognition may also influence this discrepancy, if motivation to retain the discrepancy between the two self-evaluations exists. To the extent that people fail to revise their self-assessments as new

information becomes available (i.e., enters awareness) their state and trait self-esteem may exist in perpetual discrepancy. There are many ways that people retain exaggerated positive self-views, for example by partitioning an area of weakness off from important aspects of the self (Taylor & Brown, 1988). Some may experience awareness of implicit self-esteem as uncomfortable and may be motivated to reduce the awareness. One way people may try to reduce awareness of implicit self-esteem is by adopting a more rational, or less intuitive, mindset. In an effort to increase use of rational processing, for example, people may deliberate about things they would not ordinarily think so hard about, or engage in tasks that elicit use of rational processing.

Are people motivated to avoid awareness of implicit self-esteem when mismatches exist between implicit and explicit self-esteem? Salient contradictory cognitions arouse a state of tension or discomfort that the individual strives to reduce (Elliot & Devine, 1994; Ross & Schulman, 1973). Similarly, contradictory self-evaluations may arouse aversive thoughts and feelings, leading to a desire to avoid experiencing awareness of implicit self-esteem, if implicit self-esteem diverges widely from explicit self-esteem. This may be particularly uncomfortable for individuals with high explicit but low implicit self-esteem. When those with defensive high self-esteem experience awareness of implicit self-esteem, they become aware of implicit views that are less positive than their explicit self-esteem. Because people with exaggerated positive self-views have more experiences that are contrary to their own self-views (Baumeister, 1996), if implicit self-esteem enters awareness following negative experiences (Spencer et al., 2003), implicit self-esteem may enter their awareness more often, and their behavioural responses may then reflect defensiveness. When low implicit self-esteem

enters awareness among those with high explicit self-esteem, they may tend to engage in efforts to protect themselves from such negative experiences (Jordan et al., 2003), and some people with high self-esteem who receive negative feedback may behave defensively to avoid revising their positive self-views (Baumeister, 1996). The present research shows how individuals may express self-esteem more consistent with their implicit self-views, but theorists have suggested that defensive people may respond to awareness of implicit self-esteem with self-enhancement (Spencer et al., 2005). In an effort to protect self-views, they may avoid intuition and strive for rational processing.

On the surface it may appear that people with low explicit self-esteem and high implicit self-esteem can only benefit from awareness of implicit self-esteem. Indeed, those with low explicit and high implicit self-esteem may experience a glimmer of hope, because they have high implicit self-esteem that occasionally comes into awareness (Spencer et al., 2003). This hopefulness may be characterized by fleeting positive self-views and optimism. When intuitive processing leads to awareness of implicit self-esteem with individuals with low explicit and high implicit self-esteem, as we suggest, this may lead them to draw more information from their positive implicit self-views when determining explicit self-views. However, awareness of high implicit self-esteem for people with low explicit self-esteem may make the two conflicting self-views salient. Thus discomfort and tension may accompany awareness of implicit self-esteem among people with low explicit and high implicit self-esteem. The idea that high implicit self-esteem causes discomfort when it enters awareness is consistent with findings that depressed people tend to seek interaction from people who view them unfavorably, and to solicit negative feedback in general (Swann, Wenzlaff, Krull, & Pelham, 1992).

Depressed people elicit feedback from others that confirm their existing self-views. This may occur because they strive for consistency in order to preserve their self-conceptions, as Swann and colleagues argue. If so, perhaps people with low explicit self-esteem and high implicit self-esteem are more inclined to solicit negative feedback when aware of implicit self-esteem, because their contradictory cognitions about the self become salient at this time. If positive feedback, for example, generates awareness of high implicit self-esteem among these individuals, the conflict of high implicit self-esteem with low explicit self-esteem may arouse uncomfortable, dissonant feelings. The individual with low explicit and high implicit self-esteem might engage the rational processing mode, with the result of reducing awareness of implicit self-esteem.

Coda. Returning to Jen's conflicting words and actions, Jen may have low explicit self-esteem and high implicit self-esteem. Her high implicit self-esteem may become conscious when her intuition is relatively dominant, and it may be reflected in concrete verbal reports. Jen may experience events where her behaviour and affect are influenced by her high implicit self-esteem, and if she is the kind of person that trusts her intuition, and enjoys intuitive processing, her concrete self-evaluation may reflect her positive implicit self-views. Some people, like Jen, express negative self-evaluations that contradict their high implicit self-esteem. Others express positive self-evaluations that contradict their low implicit self-esteem. For others, the self-evaluations are simply in agreement. Regardless, it seems that people can be aware of their implicit self-esteem, allowing it to influence not only feelings, thoughts, and behaviour—but also self-reports.

Footnotes

1. The inclusion of this individual's data did not affect the conclusions of the results.
2. Need for Cognition did not interact with the other variables in this analysis.

Table 1
Table of Means and Standard Deviations by Gender for Scales in
Study 1

		Males	Females
Trait self-esteem	<i>M</i>	7.3	6.7
	<i>SD</i>	0.99	1.4
State self-esteem	<i>M</i>	3.8	3.4
	<i>SD</i>	0.48	0.59
Implicit self-esteem	<i>M</i>	0.73	0.59
	<i>SD</i>	0.52	0.36
Intuitive (REI)	<i>M</i>	3.4	3.5
	<i>SD</i>	0.50	0.58
Rational (REI)	<i>M</i>	3.8	3.5
	<i>SD</i>	0.48	0.63
Need for Cognition	<i>M</i>	5.9	5.6
	<i>SD</i>	1.0	1.3

Table 2

State self-esteem reported by males and females high and low in implicit self-esteem and high and low in intuition

		Faith in Intuition	
Males			
Level of Implicit Self-esteem		Low Intuitive	High Intuitive
Low Implicit	<i>M</i>	3.5	3.7
	<i>SD</i>	0.73	0.38
	<i>N</i>	4	4
High Implicit	<i>M</i>	3.7	3.8
	<i>SD</i>	0.15	0.06
	<i>N</i>	4	3
Females			
Level of Implicit Self-esteem			
Low Implicit	<i>M</i>	3.2	3.1
	<i>SD</i>	0.34	0.52
	<i>N</i>	7	20
High Implicit	<i>M</i>	2.8	3.6
	<i>SD</i>	0.59	0.55
	<i>N</i>	15	17

Note. Higher scores indicate higher self-evaluation.

Table 3
Table of Means and Standard Deviations by Condition for Scales in
Study 2

		Intuitive	Rational
Need for Cognition	<i>M</i>	6.1	5.9
	<i>SD</i>	1.9	0.96
Trait self-esteem	<i>M</i>	6.7	6.5
	<i>SD</i>	1.2	1.2
State self-esteem	<i>M</i>	3.9	3.7
	<i>SD</i>	0.50	0.61
Implicit self-esteem	<i>M</i>	0.54	0.65
	<i>SD</i>	0.50	0.51
Speed self-evaluation	<i>M</i>	3.1	3.0
	<i>SD</i>	0.30	0.32

Table 4

Table of Means and Standard Deviations by Gender and Condition for Scales in Study 2

Condition			Males	Females
Rational	Need for Cognition	<i>M</i>	6.3	5.9
		<i>SD</i>	0.83	1.1
	Trait self-esteem	<i>M</i>	6.5	6.5
		<i>SD</i>	1.3	1.2
	State self-esteem	<i>M</i>	3.8	3.8
		<i>SD</i>	0.53	0.59
	Implicit self-esteem	<i>M</i>	0.67	0.57
		<i>SD</i>	0.37	0.54
	Speed self-evaluation	<i>M</i>	3.0	3.0
		<i>SD</i>	0.39	0.25
	Intuitive			
			Males	Females
	Need for Cognition	<i>M</i>	6.3	6.0
		<i>SD</i>	1.3	1.2
	Trait self-esteem	<i>M</i>	7.4	6.4
		<i>SD</i>	0.68	1.3
	State self-esteem	<i>M</i>	3.9	3.8
		<i>SD</i>	0.51	0.50
	Implicit self-esteem	<i>M</i>	0.64	0.49
		<i>SD</i>	0.5	0.52
	Speed self-evaluation	<i>M</i>	3.3	3.0
		<i>SD</i>	0.37	0.22

Table 5

Responses on the speeded self-evaluation task, higher scores indicate higher self-evaluation			Condition	
Level of Implicit Self-esteem			Intuitive	Rational
Low Implicit	<i>M</i>		2.14	2.22
	<i>SD</i>		0.23	0.31
	<i>N</i>		13	15
High Implicit	<i>M</i>		2.48	2.21
	<i>SD</i>		0.32	0.34
	<i>N</i>		14	16

Note. This table gives the predicted means and the standard deviations for those high and low in implicit self-esteem and in the rational or experiential conditions.

Figure 1

Figure 2

Appendix A

Rational Experiential Inventory -- 24 item short form

Please rate the following statements about your feelings, beliefs, and behaviors using the scale below. Work rapidly; first impressions are as good as any.

1 = Definitely False, 2 = Mostly False, 3 = Undecided or Equally True and False, 4 = Mostly True, 5 = Definitely True

- _____ 1. I have a logical mind.
- _____ 2. Knowing the answer without having to understand the reasoning behind it is good enough for me.
- _____ 3. When it comes to trusting people, I can usually rely on my gut feelings.
- _____ 4. I don't think it is a good idea to rely on one's intuition for important decisions.
- _____ 5. I am not a very analytical thinker.
- _____ 6. I prefer complex to simple problems.
- _____ 7. I suspect my hunches are often inaccurate.
- _____ 8. I often go by my instincts when deciding on a course of action.
- _____ 9. I am much better at figuring things out logically than most people.
- _____ 10. I trust my initial feelings about people.
- _____ 11. I generally don't depend on my feelings to help me make decisions.
- _____ 12. If I were to rely on my "gut feelings," I would often make mistakes.
- _____ 13. I am not very good at solving problems that require careful logical analysis.
- _____ 14. I like to rely on my intuitive impressions.
- _____ 15. I enjoy problems that require hard thinking.
- _____ 16. I believe in trusting my hunches.
- _____ 17. I don't like situations in which I have to rely on intuition.
- _____ 18. I don't like to have to do a lot of thinking.
- _____ 19. Using logic usually works well for me in figuring out problems in my life.
- _____ 20. I don't have a very good sense of intuition.
- _____ 21. I think there are times when one should rely on one's intuition.
- _____ 22. I enjoy intellectual challenges.
- _____ 23. Reasoning things out carefully is not one of my strong points.
- _____ 24. I try to avoid situations that require thinking in depth about something.

Need For Cognition

1	2	3	4	5	6	7	8	9
very strongly disagree	strongl y disagre e	moderatel y disagree	slightly disagree	Neutral	Slightly agree	moderatel y agree	strongly agree	very strongly agree

- _____ 1. I would prefer complex to simple problems.
- _____ 2. I like to have the responsibility of handling a situation that requires a lot of thinking.
- _____ 3. Thinking is not my idea of fun.
- _____ 4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
- _____ 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
- _____ 6. I find satisfaction in deliberating hard and for long hours.
- _____ 7. I only think as hard as I have to.
- _____ 8. I prefer to think about small, daily projects to long-term ones.
- _____ 9. I like tasks that require little thought once I've learned them.
- _____ 10. The idea of relying on thought to make my way to the top appeals to me.
- _____ 11. I really enjoy a task that involves coming up with new solutions to problems.
- _____ 12. Learning new ways to think doesn't excite me very much.
- _____ 13. I prefer my life to be filled with puzzles that I must solve.
- _____ 14. The notion of thinking abstractly is appealing to me.
- _____ 15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
- _____ 16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
- _____ 17. It's enough for me that something gets the job done; I don't care how or why it works.
- _____ 18. I usually end up deliberating about issues even when they do not affect me personally.

Rosenberg Self-esteem Scale

Please respond to each of the following statements by circling a rating on each scale. There are no right or wrong answers. If you're not sure, just give your best guess. Please use the following scale to indicate your agreement with each statement (write one number in the blank beside each statement).

1	2	3	4	5	6	7	8	9
very	strongl	moderate	slightly	neutral	slightly	moderate	strongl	very
strongly	y	ly	disagre		agree	ly agree	y agree	strongly
disagree	disagr	disagree	e					agree
	ee							

- _____ 1. I feel that I'm a person of worth, at least on an equal basis with others.
- _____ 2. I feel that I have a number of good qualities.
- _____ 3. All in all, I am inclined to feel that I am a failure.
- _____ 4. I am able to do things as well as most people.
- _____ 5. I feel I do not have much to be proud of.
- _____ 6. I take a positive attitude toward myself.
- _____ 7. On the whole, I am satisfied with myself.
- _____ 8. I wish I could have more respect for myself.
- _____ 9. I certainly feel useless at times.
- _____ 10. At times, I think I am no good at all.

State Self-esteem

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any of these statements. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these as they are true for you RIGHT NOW.

Choose the number from this scale that best indicates how you feel right now:

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
<u>5</u>			
not at all	a little bit	somewhat	very much
extremely			

1. I feel confident about my abilities. _____
2. I am worried about whether I am regarded as a success or failure. _____
3. I feel satisfied with the way my body looks right now. _____
4. I feel frustrated or rattled about my performance. _____
5. I feel that I am having trouble understanding things that I read. _____
6. I feel others respect and admire me. _____
7. I am dissatisfied with my weight. _____
8. I feel self-conscious. _____
9. I feel as smart as others. _____
10. I feel displeased with myself. _____
11. I feel good about myself. _____
12. I am pleased with my appearance right now. _____
13. I am worried about what other people think of me. _____
14. I feel confident that I understand things. _____
15. I feel inferior to others at this moment. _____
16. I feel unattractive. _____
17. I feel concerned about the impression that I am making. _____
18. I feel that I have less scholastic ability right now than others. _____
19. I feel like I'm not doing well. _____
20. I am worried about looking foolish. _____

Appendix B

REI 24 item short form (With revised instructions)

Please rate the following statements about your feelings, beliefs, and behaviors using the scale below. Answer according to how you feel RIGHT NOW at this moment. Do not worry about what you are generally like or how you might have felt in the past. Work rapidly; first impressions are as good as any.

1 = Definitely False, 2 = Mostly False, 3 = Undecided or Equally True and False, 4 = Mostly True, 5 = Definitely True

Answer based on how you feel RIGHT NOW.

- _____ 1. I have a logical mind.
- _____ 2. Knowing the answer without having to understand the reasoning behind it is good enough for me.
- _____ 3. When it comes to trusting people, I can usually rely on my gut feelings.
- _____ 4. I don't think it is a good idea to rely on one's intuition for important decisions.
- _____ 5. I am not a very analytical thinker.
- _____ 6. I prefer complex to simple problems.
- _____ 7. I suspect my hunches are often inaccurate.
- _____ 8. I often go by my instincts when deciding on a course of action.
- _____ 9. I am much better at figuring things out logically than most people.
- _____ 10. I trust my initial feelings about people.
- _____ 11. I generally don't depend on my feelings to help me make decisions.
- _____ 12. If I were to rely on my "gut feelings," I would often make mistakes.
- _____ 13. I am not very good at solving problems that require careful logical analysis.
- _____ 14. I like to rely on my intuitive impressions.
- _____ 15. I enjoy problems that require hard thinking.
- _____ 16. I believe in trusting my hunches.
- _____ 17. I don't like situations in which I have to rely on intuition.
- _____ 18. I don't like to have to do a lot of thinking.
- _____ 19. Using logic usually works well for me in figuring out problems in my life.
- _____ 20. I don't have a very good sense of intuition.
- _____ 21. I think there are times when one should rely on one's intuition.
- _____ 22. I enjoy intellectual challenges.
- _____ 23. Reasoning things out carefully is not one of my strong points.
- _____ 24. I try to avoid situations that require thinking in depth about something.

Rosenberg Self-esteem Scale

Please respond to each of the following statements by circling a rating on each scale. There are no right or wrong answers. If you're not sure, just give your best guess. Please use the following scale to indicate your agreement with each statement (write one number in the blank beside each statement).

1	2	3	4	5	6	7	8	9
very	strongl	moderate	slightly	neutral	slightly	moderate	strongl	very
strongly	y	ly	disagre		agree	ly agree	y agree	strongly
disagree	disagr	disagree	e					agree
	ee							

_____ 1. I feel that I'm a person of worth, at least on an equal basis with others.

_____ 2. I feel that I have a number of good qualities.

_____ 3. All in all, I am inclined to feel that I am a failure.

_____ 4. I am able to do things as well as most people.

_____ 5. I feel I do not have much to be proud of.

_____ 6. I take a positive attitude toward myself.

_____ 7. On the whole, I am satisfied with myself.

_____ 8. I wish I could have more respect for myself.

_____ 9. I certainly feel useless at times.

_____ 10. At times, I think I am no good at all.

State Self-esteem

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any of these statements. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these as they are true for you RIGHT NOW.

Choose the number from this scale that best indicates how you feel right now:

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
<u>5</u>			
not at all extremely	a little bit	somewhat	very much

1. I feel confident about my abilities. _____
2. I am worried about whether I am regarded as a success or failure. _____
3. I feel satisfied with the way my body looks right now. _____
4. I feel frustrated or rattled about my performance. _____
5. I feel that I am having trouble understanding things that I read. _____
6. I feel others respect and admire me. _____
7. I am dissatisfied with my weight. _____
8. I feel self-conscious. _____
9. I feel as smart as others. _____
10. I feel displeased with myself. _____
11. I feel good about myself. _____
12. I am pleased with my appearance right now. _____
13. I am worried about what other people think of me. _____
14. I feel confident that I understand things. _____
15. I feel inferior to others at this moment. _____
16. I feel unattractive. _____
17. I feel concerned about the impression that I am making. _____
18. I feel that I have less scholastic ability right now than others. _____
19. I feel like I'm not doing well. _____
20. I am worried about looking foolish. _____

Trent is an average guy, with an uncommon sense of courtesy. Few people care as much about what others think of them as Trent does. As a result, he treats everyone with the utmost respect and decency. However, sometimes Trent has been known to be a 'people-pleaser'. He is often frustrated by trying to keep everyone happy. Many people think his reluctance to make controversial choices has kept him from achieving a career to his full potential. Trent spends his weekends with his competitive bowling team. Together they practice and enter tournaments regularly. For Trent, a highlight in his life was bowling a perfect game. "Too bad it wasn't a tournament," he thought, at the time. His friends often encourage him to take up golfing but he has always insisted that bowling was simply his game. Several months ago, Trent traded his Mustang in for a Jetta. He reported that it just didn't make sense driving his old car with the rising price of gas. Friends kid him that with the money he now saves on gas, maybe he can afford to move out of his parents' house.

Would you choose Trent for a roommate? Yes or No

Susan is unhappy with her current apartment. She currently lives alone in a three-bedroom apartment and the cost is too great for her to bear. She had lived with two other girls who were students but one became engaged and moved out. Without warning, the other girl also moved out, to live with a friend, with no regard for the frustrating situation this left Susan in. Susan, whose name was on the lease, had no choice but to keep the

apartment and incur the extra cost. But now, her lease is up and she is eager to move out. Susan's unfortunate experience has doubtlessly made her short on cash. Over time, she will likely be able to pay you back but for now she can only afford to pay part of the rent. Susan works in a government job, fulltime. Her favorite bands are 'Taking Back Sunday' and 'The Used'. She can't stand people who cut in line for rides at *Paramount Canada's Wonderland*, and she hates people who purchase things without giving it thought at the time, or as she calls them "impulse buyers."

Would you choose Susan for a roommate? Yes or No

Anthony loves fast-food restaurants, especially *Wendy's*. His friends joke that all he ever wants is a *Biggie Fry* and a medium *Frosty*. He has a dog, Tug. Anthony takes Tug for walks every day, either at noon or in the evening but complains that lately it's been too cold to go out in the evenings. He just bought a digital camera and annoys his girlfriend by bringing it with them everywhere they go. He was surprised and annoyed the first time the batteries went dead on it. Anthony's girlfriend has considered hiding it from him. Anthony can tend to be a bigot sometimes—there's no denying it. In his defense, his girlfriend often says he's just stubborn. But even she concedes that he has made hurtful comments to her, telling her that she should go to the kitchen and clean up. He means to be funny, but doesn't understand that he's being offensive sometimes. His favourite movie is "Pulp Fiction". He rarely reads books.

Would you choose Anthony for a roommate? Yes or No

Mike is an only child of wealthy parents. They own a cottage somewhere north of Barrie. Mike's favorite thing to do is go up there for the weekend—any weekend, especially in the summer. Mike loves being active. He enjoys swimming, fishing, and racing with the family speedboat, tubing behind it, or waterskiing. Mike is easily bored and hates spending time alone. He often brags about how many people he can fit comfortably in his cottage. He is always planning the next weekend excursion. He often gets free Jays tickets from his dad, through the company that his dad is the president of. But he can't be bothered with such a 'slow-paced game.' Mike and his friends call his dad 'the General' because of some brief military background and because he tries to run their family efficiently like a business. Mike is doing last term over because he dislocated his shoulder in a tubing accident early in the term and subsequently withdrew from the courses he was taking at the time.

Would you choose Mike for a roommate? Yes or No

Michelle is short and smart. She grew up in Calgary and she enjoys reading fiction novels. For that matter, she just enjoys reading. If she has a good book on a Saturday afternoon, she's happy. She's been reading avidly since she was a kid. In her family there were six kids; she was the oldest. She learned to tune out her siblings early on. When she's reading or doing anything she's interested in, nothing can distract her. She never liked being the oldest, because she was always required to watch her siblings and take care of them. This was a particular nuisance to her in her adolescence when she just wanted to spend time with her friends. She moved out from home when she was quite young and has lived with a few different guys over the years. Michelle is moving out

from the place where she currently lives, because she feels like she does all the work—the work she has to do reminds her of home and she begins to feel crowded.

Would you choose Michelle for a roommate? Yes or No

Philip is clean, compulsively tidy and expects the same of others. He is a great cook and as many great cooks do, he makes a huge mess in the kitchen when he cooks. But he diligently cleans up afterwards like a chemist cleans his glassware. In fact, that is what Philip aspires to be. Philip is a chemistry student and transfers his compulsive tidiness, attention to detail and diligent care to the chemistry lab where he spends a lot of his time and energy undertaking projects that are of great interest to him and his classmates. Philip has few friends outside of school. He just doesn't seem to value others or to see the importance of having close friends. He also plays several wind instruments. He started playing the Saxophone when he was 7 years old. He loves old time jazz.

Would you choose Philip to move in with you? Yes or No

Jennifer has no problem speaking up when she's hurt. Jennifer goes straight to the source of her problems and confronts issues directly. She tends to seek love and approval from all her friends—particularly the guys. And this sometimes pushes friends away. Jennifer is a nurse at the hospital, having just completed her studies, she was recently hired through a contact that she has there. She has a tendency to interrupt conversations and to talk as though she knows everything. Regardless of the topic, Jennifer will correct or inject thoughts as though she were the principal authority on the matter. Jennifer follows nearly all the soap operas, of which *Days of our lives* is her favorite.

Would you choose Jennifer to move in with you? Yes or No

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