

## On Introspection and Self-Perception : Does Self-Focused Attention Enable Accurate Self-Knowledge?\*

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### **Abstract:**

How is introspection related to accurate self-perception? Self-focused attention is said to facilitate accurate judgments of cognitive aspects (attitudes, standards, and attributions) and somatic aspects (sensations, arousal, physical symptoms, emotions) of self. The present skeptical review concludes that the "perceptual accuracy hypothesis" is unsupported. There is simply little direct evidence, and the indirect evidence is better explained by objective self-awareness theory's core tenet: Self-focus increases consistency motivation. Most studies have also failed to appreciate the complexity of establishing the accuracy of self-judgment. The authors discuss some conceptual issues that future work should recognize, such as the logics of accuracy research, the role of honesty standards in accurate self-reports, differences in self-perception and object perception, and the implications of different self-theories for accuracy.

### **Article:**

"Knowing thyself" is important in both everyday life and professional psychology (Wicklund & Eckert, 1992). Correct information about the self is, for example, required for valid self-reports about internal states and other hidden facets of the self. People's reports about their self-knowledge are a widely used source of information (Ericsson & Simon, 1980). Physicians and psychotherapists base many of their diagnoses and subsequent treatments on patients' and clients' reports about their self-perceived symptoms; most professional clinicians form initial hypotheses after talking with a patient for only 15 s (Elstein, Shulman, & Sprafka, 1978). Likewise, researchers in the human sciences use self-reports about attitudes, affect, beliefs, and somatic states as a major, and often the only, source of information. It is thus crucial that people have accurate self-knowledge if psychologists are to prevent the potentially catastrophic consequences of improper medical or psychotherapeutic treatments and if data from the human sciences are to be regarded as meaningful. But how well do people know themselves? Do reports about internal states correspond to what actually happens "inside the skin"? Some aspects of the self appear to be largely inaccessible. Research on interoception (e.g., Reed, Harver, & Katkin, 1990), for example, shows that people are rather poor judges of their internal somatic states. Knowledge about somatic activity is unlikely to be correct for most people most of the time. In fact, studies often show that most people make huge mistakes in apparently easy tasks, such as heart rate estimation. On other occasions, reports of self-knowledge are clouded by motivational concerns (Jones, 1990). Even if people have deep access to their inner states, they are not always willing to share it with others.

### ***Self-Focus and the "Perceptual Accuracy Hypothesis"***

Because of such phenomena, psychologists recognize that self-reports about inner states should be treated cautiously. Indeed, some psychologists reject self-reports as valid sources of psychological information. If

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people are clueless, disingenuous, or both when it comes to judging and reporting the self, as some have argued (Bem, 1972; Nisbett & Wilson, 1977), can we ever know whether people are capable of accurate self-knowledge? Some psychologists adopt an intermediate position, arguing that certain psychological processes can moderate whether or not self-perception is accurate. Primary among these variables is self-focused attention.

Attention allows selective and detailed information about stimuli. When attention is guided to an object, the object becomes figural against the background of the perceptual field. Knowledge of the object thus becomes more detailed and clarified, and perception of the object is consequently more accurate. This becomes evident in more detailed and accurate memory for stimuli that receive the focus of attention (Anderson, 1990). The attention–accuracy link forms the cornerstone of what we call here the “perceptual accuracy hypothesis.” In this view, self-focused attention is the fundamental mechanism that allows accurate and detailed information about the self. Self-perception and object perception are assumed to be dynamically identical. By introspecting, people can sharpen their awareness of self-knowledge and thus make more accurate self-judgments.

The perceptual accuracy hypothesis is very intuitive. What could the term self-awareness possibly mean if it did not involve heightened self-knowledge? If introspection does not facilitate self-knowing, the search for moderators of accurate self-reports seems hopeless. There is also a vast literature concerned with self-focus and the accuracy of self-knowledge. Researchers have argued that self-focus makes people more aware of their attitudes; less suggestible regarding internal states; more resistant to placebo effects; more attuned to arousal, physical symptoms, and physiological processes; more aware of emotional states; and more likely to make accurate causal attributions (Gibbons, 1983, 1990). Indeed, this is probably the least controversial issue in contemporary self-awareness research.

Our goal, however, is to present a contrarian view of the perceptual accuracy hypothesis. We believe that a skeptical look at the evidence reveals serious and previously unrecognized problems. There is very little direct evidence; nearly all studies infer perceptual accuracy from a specific pattern of results. We contend that this pattern can be explained by alternative processes that are considerably simpler and directly supported by numerous studies. Some studies have produced equivocal findings and are less relevant to the hypothesis than previously thought, other studies contradict the hypothesis, and still other studies have failed to establish the basic procedures needed for demonstrating accuracy or inaccuracy. We conclude that there is essentially no evidence for the perceptual accuracy hypothesis. In the final section of this article, we discuss the logic of establishing accuracy, speculate about the role of “honesty standards” in accurate self-knowing, consider why consciously apprehending the self might fundamentally differ from apprehending an object, and note the role of self-theories in theories of self-judgments.

### *Locating Perceptual Accuracy in Self-Awareness Theories*

The psychology of self-awareness is actually a class of distinct theories concerned with the nature of self-focused attention. Although their differences are often subtle and technical, these theories make very different assumptions about the foundations and consequences of self-awareness. The perceptual accuracy hypothesis is one of the assumptions on which the theories disagree. Some theories require it to be true, others are agnostic, and still others would not predict greater accuracy. Several applications of self-awareness to clinical and health psychology also rely heavily on the perceptual accuracy assumption. The validity of this hypothesis, then, carries serious implications for the relative standing of these theories.

### **Objective Self-Awareness Theory**

The experimental study of self-awareness is traceable to early research by Wolff (1932), who studied reactions to physical features of the self, such as one's voice and body parts. The first modern theory was Duval and Wicklund's (1972) original formulation of objective self-awareness theory (OSA theory), which was concerned with the self-reflexive quality of consciousness. People could become aware of the self's existence as an object in the world “when attention is directed inward and the individual's consciousness is focused on himself, he is the object of his own consciousness—hence ‘objective’ self awareness” (Duval & Wicklund, 1972, p. 2).

Objective self-awareness is a state in which the person engages in reflexive role taking; the self is viewed from the perspective of an actual, hypothetical, or generalized other (Baldwin & Holmes, 1987; Mead, 1934; Shibutani, 1961). The objective state is thus a self-critical state. The self is seen as an object in the world distinct from others, an object with boundaries, fixed properties, and the capacity to be controlled (Silvia, 2001).

This form of experience is contrasted with “subjective self-awareness,” which occurs when attention is focused away from the self and the person “experiences himself as the source of perception and action” (Duval & Wicklund, 1972, p. 3). The person in this state feels active and agentic, experiential, and unified with the environment through the medium of activity. It is not simply an absence of self-awareness; subjective self-awareness is clearly relevant to understanding the deindividuated state, but they are not the same. This is a common misunderstanding that is not generally supported by research (Postmes & Spears, 1998).

OSA theory relates self-focus to activity through the concept of self–standard comparison. Self-directed attention initiates a comparison between the self and salient standards that specify states the self “ought to have.” Self and standards compose a consistency-seeking system with a preferred state of maximal similarity. Negative affect arises if a discrepancy is found. Like other consistency theories, OSA theory assumes that negative affect motivates consistency restoration, which in turn reduces negative affect. The specific route of discrepancy reduction is apparently determined by causal attributions for the discrepancy (Duval & Lalwani, 1999). If the self is seen as responsible, people will change the self to match their standards. If people attribute failure to their standards, they will perceive them as unreasonably high and change them to be consistent with the self.

A large literature supports the link between objective self-awareness and self-evaluation against standards (Silvia & Duval, 2001). Objectively self-aware individuals seek information that would allow self-assessment (Scheier & Carver, 1983) and correct decisions (Wicklund & Ickes, 1972), as well as make behavioral efforts to conform to standards. This latter effect has been found in many areas; recent examples include adhering to standards regarding stereotyping (Macrae, Bodenhausen, & Milne, 1998), consuming fatty foods (Sentryz & Bushman, 1998), treating others morally (Batson, Thompson, Seufferling, Whitney, & Strongman, 1999), and emotional experience (Silvia, in press-b). Additional evidence for the consistency motive comes from studies showing that meeting standards leads to positive affect (Ickes, Wicklund, & Ferris, 1973, Study 3), whereas failing to meet standards leads to negative affect (Ickes et al., 1973; Sedikides, 1992).

The original theory made no claims about perceptual accuracy (Duval & Wicklund, 1972). Yet, many aspects of the theory show that increased accuracy is not something it would have predicted. Several experiments discussed in the original monograph show how objective self-awareness influences perception in nonaccurate ways. Experiments on causal attribution revealed that objectively self-aware people ascribe more causality for hypothetical events to the self (Duval & Wicklund, 1973). Other studies showed that objective self-awareness attenuated perceptions of personal control (Duval & Ritz, 1972) and that objectively self-aware people were more likely to form consistent impressions based on contradictory person descriptors (Davis & Wicklund, 1972). Later statements of OSA theory (Duval & Silvia, 2001; Silvia & Duval, 2001; Wicklund, 1975) have continued to avoid claims of accuracy and inaccuracy.

The flavor of these findings implies altered perception of self and others; it does not imply more accurate perceptions. Indeed, underestimating one's personal control and viewing contradictory traits as consistent seem inhospitable to a simple self-focus–accuracy relationship. This theme of altered perception continued throughout later self-awareness research. Objective self-awareness has been found to lead to less differentiated impressions of other people (Vallacher, 1978), complex effects on perceptions of causality (Duval & Duval, 1983), a greater sensitivity to the perspectives of others (Hass, 1984; Stephenson & Wicklund, 1983), exaggerated feelings of transparency (Vorauer & Ross, 1999), dialectical self-perceptions (Silvia, 2001), and the perception of one's behavior in light of internalized others (Baldwin & Holmes, 1987). The “altered, not accurate” theme recurs throughout the empirical literature on accuracy.

## **Hull and Levy's Encoding Theory**

The first alternative to OSA theory was proposed by Hull and Levy (1979). They argued that self-awareness effects do not require a concept of attentional focus. Instead, “self-awareness corresponds to a particular form of encoding process that has its effects on behavior independent of focal attention and comparison processes by rendering the individual sensitive to those aspects of the environment that are potentially self-relevant” (Hull & Levy, 1979, p. 757). Perceptual accuracy is predicted by this theory because physiological states specify “particular kinds of relationships between self and environment” (p. 758). Because bodily states represent self-relevant information, they will receive this “particular form of encoding” and, as a result, be experienced with greater clarity and influence behavior more strongly. Strictly speaking, however, this theory would not agree that self-focused attention per se has anything to do with increased accuracy.

History has not been kind to Hull and Levy's theory. Their model never expanded to address some of its conceptual limitations, such as how information can be categorized according to its self-relevance without accessing and collating—that is, attending to—features of the self. Indeed, the core concept of a “form of encoding” that operates independently of the direction and intensity of attention seems vague at best and mysterious at worst (Wicklund & Hormuth, 1981). Nevertheless, it is worth noting that the encoding approach distinguishes itself from OSA theory and aligns itself with later theories by offering reasons why self-focus would make self-judgments more accurate.

### **Self-Regulation Theory**

Carver and Scheier (1981, 1998) developed a theory of self-focused attention based on principles of self-regulating feedback systems (G. A. Miller, Galantner, & Pribram, 1960). In this model, self-focused attention simply refers to the direction of attention, which can be oriented externally toward the environment or internally toward the self. Unlike OSA theory, no experiential distinction between “objective” and “subjective” is invoked. This model also departs from earlier work by arguing that self-focus can be directed toward “public” and “private” aspects of the self. When self-focus is high, people compare current activity with a representation of behavior that is located within a hierarchy of representations. If people have difficulties in meeting the standard, they might disengage or shift activity to a lower level in the hierarchy (Carver & Scheier, 1981).

The perceptual accuracy hypothesis played an important part in the early model of self-regulation (Carver, 1979; Carver & Scheier, 1981). Without the heightened clarity produced by self-focus, it would be difficult for people to efficiently self-regulate against internalized goal states. Inaccurate self-perceptions of an attitude or emotion, for example, would lead to an improper choice of standards. In fact, the perceptual accuracy hypothesis was first introduced as a part of this theory's empirical program (Gibbons, Carver, Scheier, & Hormuth, 1979; Scheier, Carver, & Gibbons, 1979). In the latest version of the theory (Carver & Scheier, 1998), self-focus is much less central, and, as a result, notions of perceptual accuracy are less pivotal.

### **Gibbons's Multilevel Model**

Gibbons's multilevel model of self-focus relies most heavily on notions of perceptual accuracy. This theory proposes, like past theories, that self-focused attention causes a spontaneous self-assessment process. Unlike past theories, however, it differentiates this evaluative process into three levels. When self-focused on the experiential level, the person will have a heightened awareness of emotions, arousal, and bodily sensations; interoception will be more accurate. Self-assessment on the behavioral level will lead to a consideration of standards that specify correct activities; this is the sort of regulation described by Carver and Scheier (1981). Self-focus can also lead to global and abstract assessments at the evaluative level. Here the self-focused person considers how he or she is faring in relation to an ideal self. The concern is beyond simple motor activity and extends into morals and values. At this level, attitudes, standards, and values are perceived more accurately. In this model, then, increased accuracy is a key way in which self-focus is connected to different outcomes. Indeed, Gibbons claimed widespread effects of self-focus on accuracy, ranging from the effects just noted to cognitive processes such as causal attribution.

### **Models of Psychopathology**

Self-focused attention influences a vast range of clinical and health concerns (Pyszczynski, Hamilton, Greenberg, & Becker, 1991). Several mini-theories of self-awareness specify how self-focus is implicated in different problems, particularly depression (Pyszczynski & Greenberg, 1987), test anxiety (Wine, 1971), and suicide (Baumeister, 1990). Other models try to cast an integrative theoretical net over many different disorders (Ingram, 1990; Wells & Matthews, 1994). Here is not the place to review these models' many subtle and significant differences. In general, though, perceptual accuracy is an important bridge between self-focused attention and psychopathology. The typical structure of these models assumes that some event occurs and then high self-focus heightens one's awareness of the event's consequences (e.g., negative affect, physical symptoms, or appraisals of one's ability or of a task's level of difficulty). These effects of self-focus then provide feedback or interact with other processes (e.g., catastrophic thought or attributional style), which contributes to developing problems. Some theories, for example, assume that self-focused attention enhances awareness of physical symptoms, which is a foundation of panic attacks and various phobias (see Wells & Matthews, 1994). But perhaps self-focus might itself exaggerate physical symptoms apart from additional mechanisms such as catastrophic thought. Without heightened accuracy, some of these models would need revision; it matters whether self-focus accurately informs or inaccurately distorts the experience of symptoms and affect.

### *Reviewing the Evidence*

With this backdrop, we now turn to the evidence for the perceptual accuracy hypothesis. Self-focus has been said to enable accurate judgments of attitudes, somatic states, emotions, and causal attributions. We discuss these in turn and consider alternative explanations and possibilities for future research. We chose a conventional rather than a meta-analytic review because we are questioning the prevailing interpretation, not the existence or magnitude, of an effect. Many of the studies reviewed also have methodological problems, such as inappropriate comparison groups or uninformative measures, that make an aggregated meta-analytic review uninformative. 1

### *Knowledge of Attitudes*

Research on self-awareness and perceptual accuracy emerged from early studies on attitude–behavior consistency conducted by Pryor, Gibbons, Wicklund, Fazio, and Hood (1977). These studies are often improperly described as tests of the perceptual accuracy hypothesis. They were actually intended to demonstrate that self-focus leads to higher attitude–behavior consistency because self-focus amplifies consistency motivations, not because of more accurately perceived attitudes. Nevertheless, these studies launched the interest in perceptual accuracy as a concomitant of self-focus. The reason for this may be that behavior in accordance with one's attitudes implies that the respective attitudes have to be highly accessible to result in consonant behavior.

In Experiment 1, participants first completed a self-report measure of sociability and then interacted with a confederate of the experimenter. Half of the encounters took place in front of a large mirror, and the other half occurred without the mirror. The dependent measure was participants' behavior during the encounter. Both behavior observations and counts of the number of words spoken by the actual participants were more strongly related to the self-report measure of sociability when the encounter took place in front of the mirror, which reliably increased self-focus (Carver & Scheier, 1978).

Experiment 2 dealt with how honestly people reported self-relevant, and potentially threatening, information: Scholastic Aptitude Test (SAT) scores. Participants were asked to report their SAT scores on a questionnaire with their name on it. The actual SAT scores, which were accessible to the experimenters, served as the objective standard for assessing the accuracy of the self-reports. Participants gave more honest responses when they faced a mirror. Hence, they more accurately reported their SAT scores. This was especially true for those individuals whose scores were below the median and were presumably the most threatened by being honest. Given that it was possible to compare participants' self-reports with their actual scores, the results may suggest that self-focus does increase the accuracy of self-perception. As we argue later, however, it is more likely that self-awareness simply made the standard of honesty salient and that perceptual accuracy did not differ between the conditions.

In Experiment 3, participants first formed attitudes toward different types of tasks. Next they were allowed to choose among five tasks and to work on them for 10 min. Participants then rated each task's attractiveness while either facing a mirror or not. The correlation between self-reported task attractiveness and time spent working on the task was significantly higher in the mirror condition than in the no-mirror condition. That is, self-awareness increased attitude–behavior consistency.

Gibbons (1978) extended this research by looking at “sex guilt,” a preexisting and personally significant standard. In the first study, men who held positive or negative views toward pornography were asked to evaluate pictures of nude women. Self-awareness was induced by having half of the men face a mirror when viewing the pictures and making the judgments. The correlation between pornography attitudes and evaluations was high for the high self-focus group ( $r = .60$ ) but significantly lower for the low self-focus group ( $r = -.21$ ). The second study asked women high and low in sex guilt to read erotic and bland literary passages. Sex guilt strongly influenced liking for the erotic passage when self-focus was high ( $r = -.71$ ), but it had no effect when self-focus was low ( $r = .02$ ). 2

These studies collectively show that attitudes more accurately predict behavior when people are self-focused. They do not show, however, that self-focused people have richer or deeper access to their attitudes, nor were they intended to test this hypothesis. Both Pryor and colleagues (1977) and Gibbons (1978) argued that the increased attitude–behavior consistency resulted from a greater motivation to be self-consistent. This is quite a different claim from the perceptual accuracy view: Two people may be equally aware of their attitudes, yet only the self-focused person is concerned about being consistent. These early studies are often misrepresented, and it is important to realize what they are actually claiming. The perceptual accuracy hypothesis was explicitly formulated in later research, which we now consider.

### *Knowledge of the Physical Self, I: Resistance to External Information About Internal States* **Suggestibility and Judgments of Internal States**

The perceptual accuracy hypothesis was first explicitly formulated in a set of articles on judgments of internal states (Gibbons et al., 1979; Scheier et al., 1979). These studies and the research that followed attempted to demonstrate perceptual accuracy indirectly by showing that highly self-focused people are less influenced by external information about internal states. If increased self-focus heightens access to internal information, then self-focused individuals should base judgments about internal states on internal information. Self-focused persons should thus be less easily deceived by bogus information about internal states.

It is critical to note that increased accuracy is not directly demonstrated; it is inferred from an attenuated or null effect of external information. This opens the door for several alternative explanations that, we believe, are at least as plausible as the perceptual accuracy hypothesis.

#### Sexual excitement

Scheier et al. (1979) conducted two studies in which self-focus was expected to reduce suggestibility, which was defined as an attenuated impact of external information on self-judgments. The first study investigated effects on ratings of sexual arousal. Male participants viewed slides of nude women and evaluated them with regard to their sexually arousing effects. Immediately before the slide presentation, half of the participants were casually told by the experimenter that other participants had judged the slides as completely nonarousing. The other participants were casually told that others had said the slides were very exciting. Self-awareness was also manipulated. In the high self-awareness conditions, the slides were presented through 50% reflecting glass. Participants saw themselves reflected in this glass between the presentations of the seven single slides while they made their excitement ratings. In the low self-awareness condition, the glass was nonreflective, and participants did not see their images between slide presentations.

The mean arousal ratings of the slides showed a strong main effect for the excitement information. The ostensibly arousing slides were rated as more exciting than the ostensibly nonarousing ones; all participants'



judgments were vulnerable to the external information. This effect, however, was moderated by self-awareness. The external information effect was reduced—though still present—in the mirror condition relative to the no-mirror condition.

### Taste

In Scheier et al.'s (1979) second study, participants rated the taste of beverages. Unlike the first study, this experiment manipulated both external information and the actual internal state. To provide a taste baseline, all participants first tasted and rated a 1.4:100 peppermint–water solution. The critical trial followed. Some participants were informed that the next drink would be stronger in taste, whereas others were informed that it would be weaker. This information was crossed with actual taste intensity. In the strong condition, participants tasted a 1.9:100 peppermint–water solution; the solution in the weak taste condition was 0.9:100. Self-focus was operationalized as individual differences in private self-consciousness, which often (but not always; Duval & Silvia, 2001) replicates manipulations of situational self-awareness (Carver & Scheier, 1978; Wicklund & Gollwitzer, 1987). A median split divided participants into low and high scoring groups. The dependent variable was the taste change score from the first trial (serving as baseline and taste anchor) to the critical second drink.

The results showed a main effect for solution in the expected direction: stronger taste ratings for the stronger solution. The main effect for taste expectancy was also significant and reflected stronger taste ratings for stronger expectancies. As expected, however, this latter main effect was further qualified by a significant interaction between expectancy and private self-consciousness. Participants scoring high in terms of private self-consciousness were less vulnerable to the external taste information than participants scoring low on this measure. The three-way interaction was not significant.

In summary, the two experiments showed the same effect: Self-focus attenuates the impact of external information on judgments about internal states. According to Scheier et al. (1979), the decreased suggestibility stemmed from a richer awareness of internal states. Yet, this is only one possible explanation. We propose some alternatives after considering the related body of work on placebo effects.

### Detecting placebo effects

If self-awareness enables richer access to internal experiences, then self-focused people should be more resistant to placebo effects. They should know, after all, whether or not a drug is actually influencing their internal states. Gibbons et al. (1979) tested this hypothesis with a study that ostensibly focused on learning under conditions of manipulated arousal. Two individuals, a confederate of the experimenter and a participant, took part in each experimental session. The confederate played the role of a “learner” and was in the “test condition,” whereas the actual participants were told that they would be in a control condition and thus only had to observe the learner. Participants were (high self-awareness) or were not (low self-awareness) exposed to their own mirror image and received 5 g of bicarbonate of soda mixed with water. Half of the participants were misinformed that this “drug” (called “Cavenol”) would have an arousing effect similar to caffeine. For the other half, the drug was correctly labeled as “soda” to ensure that no arousal effects would be expected. After observing the learner's performance, participants completed a questionnaire with measures of perceived arousal and physical symptoms.

In addition to a main effect for type of external information—higher arousal ratings in the Cavenol than in the soda conditions—results showed that self-aware participants in the Cavenol condition reported fewer of the specific symptoms that had been ascribed to the drug than did participants low in self-awareness. As in the Scheier et al. (1979) experiments, self-awareness once again attenuated the impact of external information on self-judgments.

Similar results were obtained in two experiments conducted by Gibbons and Gaeddert (1984). In the first study, self-awareness was manipulated with a mirror. Participants received a placebo (“Covalan,” actually 250 mg of baking soda) and were instructed to perform an evaluative cognitive task (arithmetic problems). Whereas people in the Gibbons et al. (1979) study only observed performance, people in this experiment actually performed the

task. Half of the participants were told that the drug would interfere with performance, and the other half were told that it would facilitate performance. Dependent measures were ratings of the effectiveness of the drug taken after performance of the math problems.

Participants were expected to show a self-serving bias by attributing more effectiveness to the performance-inhibiting drug. This would reduce accountability for bad performance and increase accountability for good performance. But self-awareness was expected to counteract this tendency because it should increase awareness of the actual arousal state. As predicted, the self-serving bias effect occurred in the conditions without a mirror. The rated effectiveness of the performance-inhibiting drug was higher than that of the performance-facilitating drug, which was rated as very low. But in the conditions with a mirror, participants showed no difference in effectiveness ratings, which reflected relatively high effectiveness regardless of the ostensible performance effect.

In the second study, Gibbons and Gaeddert discarded the math task to reduce arousal due to evaluation apprehension and to minimize the self-serving bias effect. The procedure of this study was thus directly comparable to that of Gibbons et al. (1979), except that all participants were misinformed. Participants took the drug and observed a yoked participant working on a learning task. Half of the participants were again told that the drug would have performance-facilitating or performance-inhibiting effects, but, given their observer role, not on their own performance. They then rated the drug's effectiveness. Results showed a main effect for the mirror manipulation: Self-aware participants reported weaker drug effects than non-self-aware participants, regardless of the drug's inhibiting or facilitating effect. 3

#### Contrary findings

Levine and McDonald (1981) noted the lack of direct evidence and suggested that self-awareness was simply making people more resistant to external demands. If the experimenter's expectancy is clear to the participant, either as a statement of taste intensity or a list of symptoms to be expected, then the participant may be responding on the basis of the experimenter's statements rather than on the basis of internal states. In this view, self-awareness may make people more resistant to external demands (cf. Carver, 1977), not more sensitive to internal information.

To test this possibility, Levine and McDonald designed a study that presumably concerned the effects of certain drugs on visual perception. Participants were given a placebo with ostensibly arousing, tranquilizing, or neutral physiological effects. After completing some filler visual perception tasks designed to bolster the cover story, participants completed a questionnaire; half were seated in front of a mirror. The questionnaire asked about perceived physical symptoms and the drug's overall effectiveness. Participants also estimated the relative dosage level of the drug. A final measure assessed how people assessed the drug's effectiveness. Participants distributed 100 points according to whether they used bodily state changes, behavioral changes, or other factors when judging the drug's overall effectiveness.

As predicted, the three drug groups reported experiencing the expected levels of physiological arousal. Contrary to the perceptual accuracy hypothesis, self-awareness had no effect on reported arousal or the overall effectiveness of the drug. In fact, self-awareness made people less accurate. The high self-awareness group rated the placebo dosage as significantly greater than the low self-awareness group; perceiving a placebo as more intense certainly cannot reflect deeper access to internal states. Even more challenging is the finding that the self-aware group reported relying significantly less on internal bodily states when judging the drug's overall effectiveness. This challenges the very idea that self-focus attunes people to internal information, let alone that it makes the information more accurate.

Levine and McDonald (1981) interpreted their study as showing “reduced susceptibility to external demands, rather than heightened awareness of internal states, for those made self-aware” (p. 655). The study does not directly support their explanation, and there are good reasons to doubt that self-awareness always reduces susceptibility to external demands. Sometimes high self-focus makes people feel less autonomous and more



controlled (Duval, 1976; Duval & Ritz, 1972; Plant & Ryan, 1985). Either way, this study quite clearly shows that self-focus need not make judgments of internal states more accurate or even orient people to internal information when making such judgments.

### **Revisiting Self-Consistency**

The suggestibility and placebo studies form the cornerstone of the perceptual accuracy hypothesis, yet by now it should be clear that the hypothesis has no direct support. What has been reliably shown is that the judgments of self-focused people are less influenced by external information. Is there another explanation for this pattern? We believe that a much simpler possibility can be offered: Self-awareness simply increases the desire for consistency among different aspects of the self. This is nothing more than the core tenet of the original self-awareness theory (Duval & Wicklund, 1972; Wicklund, 1975), and it has received consistent support. As discussed earlier, self-focus leads people to seek out comparison standards (Scheier & Carver, 1983), promotes greater consistency between actions and standards (Silvia, *in press-b*; Silvia & Duval, 2001), and causes more extreme emotional reactions to congruity and incongruity (Ickes et al., 1973; Sedikides, 1992).

People high and low in self-awareness can have equal access to their internal states, attitudes, and standards, but only highly self-aware people are concerned with making consistent judgments. All of the people in the sexual arousal study (Scheier et al., 1979), for example, probably knew that their reactions to nude women differed from the experimenter's suggestion. But only the members of the high self-awareness group would be concerned with consistency between their feelings and their judgments. Going along with the authority figure would be less important than for the low self-awareness group, which had fewer consistency concerns. In fact, many self-awareness studies openly state and enforce a standard, yet only highly self-aware people try to meet it (e.g., Dana, Lalwani, & Duval, 1997; Duval & Lalwani, 1999). Salience does not differ here; consistency motivation does.

The SAT study of Pryor et al. (1977, Study 2) supports this explanation. Recall that self-focused people more accurately reported their SAT scores and that the effect was strongest for individuals scoring below the median. If the perceptual accuracy interpretation is correct, then we would have to believe that the low self-awareness group had a harder time recalling their SAT scores from memory. The fact that high and low scorers on the SAT had different responses to self-awareness suggests that this is incorrect. Pryor et al. instead argued that individuals high in self-awareness were compelled to achieve consistency between their self-reports and actual scores, even when it made them look bad, whereas individuals low in self-awareness were less concerned about self-consistency.

Other evidence for a self-consistency explanation comes from recent work on attributions for discrepancies (Duval & Silvia, *in press*, Study 3). After a self-awareness manipulation, people were told they had passed or failed a cognitive task. Unlike past self-awareness studies, manipulation checks of discrepancy size were included. The manipulation checks showed that all people knew that they had met or failed to meet the standard. But only the high self-awareness group cared; only this group made defensive attributions, showed decreased self-esteem, and so forth. If this effect had been due to perceptual accuracy, then members of the low self-awareness group would have ostensibly been less aware of their poor performance and relation to the standard. Yet, this did not happen; the low self-awareness group showed equal awareness of the discrepancy. They showed none of the consequences because self-consistency concerns are minimal when self-awareness is low. This clearly shows how self-awareness can produce different reactions when people have equivalent knowledge. In short, we do not have to assume that self-focus makes standards salient for one group and not another. The standards could be equally salient, but only the self-focused group would care about meeting the standards.

There is nothing in the suggestibility studies that contradicts this alternative explanation, which is simple and directly supported. The perceptual accuracy hypothesis, in contrast, has no direct support. We are not arguing that consistency motivation and accuracy are necessarily antagonistic, nor have proponents of the accuracy position; it is theoretically possible for both effects to peacefully coexist. Nor are we trying to “disprove” the

hypothesis. To the contrary, we want to show that it has yet to be demonstrated, let alone “proved.” We are only claiming that the core mechanism posited by the original OSA theory—consistency motivation—can explain all of these findings. Until there is evidence that compels adding a second mechanism, the original theory is sufficient.

## **Summary**

The core evidence for the perceptual accuracy hypothesis appears to be less compelling than previously believed. The suggestibility and placebo studies offer only indirect support, and they can be accounted for by other explanations that are directly supported. We thus view these studies as suggestive, at best. Later studies attempted to test the perceptual accuracy hypothesis directly. Instead of providing external information about internal states, actual changes in somatic states were induced or measured. This ensured that there was something to be judged. In most of the studies, accuracy was assessed by comparing self-reported self-knowledge against physiological indexes. Including a criterion for accuracy circumvented the primary problem with the suggestibility and placebo studies and enabled a direct test of the hypothesis. Yet, as we argue subsequently, these studies have their own methodological problems, and many fail to support, and even contradict, the perceptual accuracy hypothesis.

## *Knowledge of the Physical Self, II: Interoception of Actual Somatic States*

### **Perception of Caffeine and Alcohol Symptoms**

L. C. Miller, Murphy, and Buss (1981) proposed a scale that assessed individual differences in body consciousness. This distinction is similar to the earlier self-consciousness scales (Fenigstein, Scheier, & Buss, 1975), which distinguished “private” from “public” aspects of the self. The correlations between the respective body and self-consciousness scales are moderate. Oddly enough, “public” body consciousness included physical aspects of the self such as internal states. Past work (Scheier et al., 1979) assumed that this was a category of “private” events.

In an experiment designed to validate the body-consciousness inventory, participants from one female and two male samples drank hot chocolate that, unbeknownst to them, was or was not mixed with caffeine; the dosage was adjusted for men and women. Participants were told that the taste of different beverages was being tested. The two dependent measures were physiological assessments of heart rate and self-reported symptoms. This study thus had a criterion against which accuracy could be assessed. Participants scoring high in terms of private body consciousness reported significantly more caffeine-like bodily changes than did participants who scored low on this measure. Regression analyses revealed that neither public body consciousness nor private or public self-consciousness was independently related to the caffeine-like symptoms.

The problem, however, is that the caffeine manipulation failed to affect heart rate as measured physiologically. If the groups did not differ in their heart rates but differed in their self-reported symptoms, it seems questionable to conclude that private body consciousness is promoting accurate cardiovascular perception. After all, the physiological measure is the criterion of accuracy; it seems very strange to argue that divergent judgments are accurate. This finding instead suggests that the differences reflect an overestimation of physical symptoms. In fact, such overestimation has been observed in other studies. Levine and McDonald (1981) found that self-aware people perceived a placebo's dosage as significantly higher than non-self-aware people, and Pennebaker (1982) reported a series of studies suggesting that focusing attention on the self is accompanied by a readiness to overestimate physical symptoms. Other studies have shown that self-awareness leads to exaggerated perceptions in several judgment domains (e.g., Duval & Wicklund, 1973; Fenigstein & Abrams, 1993; Mayer, Duval, & Duval, 1980; Vallacher, 1978; Vorauer & Ross, 1999). Here we see the “altered perception, not accurate perception” theme.

In a test of alcohol's effect on self-awareness, Hull, Levenson, Young, and Sher (1983, Study 3) asked participants to consume either an alcoholic beverage or a placebo. Ancillary measures of perceived alcohol consumption showed that self-consciousness did not enable more accurate perceptions of the typical symptoms of alcohol consumption. The authors noted that “high self-conscious subjects were slightly less likely than low

self-conscious subjects to discriminate alcoholic from placebo beverages” (Hull et al., 1983, p. 471). Once again, this suggests overestimation and exaggeration. We should interpret this cautiously, however, because statistical comparisons were not reported.

## **Inducing and Perceiving Residual Arousal**

### Reducing excitation transfer

Reisenzein and Gattinger (1982) conducted a study on self-awareness and excitation transfer. They expected self-focused attention to promote accurate symptom perception and thus prevent the misattribution of residual arousal. Self-aware people were expected to attribute their arousal (i.e., the symptom) correctly to exercise and not to a later mood induction. When self-focus was high, residual arousal was expected to result in less intense affect, assessed through self-report. When self-focus was low, residual arousal was expected to result in relatively more intense affect, thus reflecting the transfer of existing arousal to a later somatic state.

After a baseline measure of mood, participants were asked to judge a series of slides. Half of the participants sat quietly, whereas the other half rode an exercise bicycle during the slide presentations. After rating the slides, which were presented only for the sake of the cover story, participants were asked to complete the Velten (1968) mood induction procedure. Half completed the positive statements, and the other half completed the negative statements. This was done in a cubicle that contained either a large mirror or no mirror. Another self-report measure of affect was then taken. Participants also completed a self-report measure of the intensity of various physical symptoms and attributions for their current state to the previous exercise experience.

The results only partially supported the hypothesis. Although manipulation checks showed that the mood inductions were successful, the predictions were supported only in the negative affect conditions. Self-focused participants who experienced residual arousal during the negative mood induction were less vulnerable to the mood manipulation than those who were not self-focused. In contrast, those who were self-aware and not aroused showed the strongest mood decrease. Those who were neither self-aware nor aroused showed the weakest induction effect. In the positive mood conditions, however, there was only an arousal effect; aroused participants were more vulnerable to the induction than those who were not aroused. In these conditions, self-focus had, contrary to predictions, no effect on the misattribution of residual arousal.

According to Reisenzein and Gattinger (1982), the results are consistent with their predictions, showing that “induced self-focus in an excitation transfer paradigm leads to increased symptom perception, reduced likelihood of misattribution, and elimination of the excitation transfer effect” (p. 325). We are more skeptical, for several reasons. The predictions were not confirmed for the “positive mood” half of the design. The mood manipulation checks were highly significant, and the positive and negative mood groups reported equally strong physical symptoms, yet self-focus had different effects on each group. Differences between positive and negative moods are not predicted by theories of excitation transfer, and certainly not by the perceptual accuracy hypothesis, which assumes that the effect of self-focus is general across different somatic states and emotions (Scheier & Carver, 1977). It remains for this work to explain the mood differences.

A second problem is that no physiological measures were actually taken. Such measures would provide a direct standard for accuracy instead of the indirect self-report of affect. Indeed, arguing that self-focus enables better somatic judgments on the basis of relations between self-reported affect and self-reported somatic symptoms seems questionable to us, given that self-awareness increases the motivation to be consistent in one's reports (Gibbons, 1978; Pryor et al., 1977). Physiological measures are also important because self-focused attention per se can influence arousal, albeit in complicated ways (Gillis & Carver, 1980; Paulus, Annis, & Risner, 1978). Researchers cannot account for these confounding influences without repeated physiological assessments. And, finally, it is up to this study to demonstrate accuracy directly, not indirectly. What about the design, which was (a) between subjects, thus obscuring the within-subject information needed to show accuracy (Lamiell, 1987; Hastie & Rasinski, 1988), and (b) lacked a criterion for accuracy, enables us to claim increased or decreased accuracy? Certain methodologies must be used in accuracy research, a point to which we return later.

Half of the design might be “suggestive,” depending on one's sympathies, but one would hope for more than this.

### Estimating residual arousal

A later study remedied these problems by directly inducing and assessing sympathetic arousal. Indeed, this study comes close to the ideal test of the perceptual accuracy hypothesis. Hansen, Hansen, and Crano (1989) conducted two experiments using a residual arousal induction. They were interested in whether high self-focus influences the effects of sympathetic arousal on self-attention (Wegner & Giuliano, 1980, 1983) and how self-attention increases the accuracy of arousal perception. Unlike most past studies, these studies involved actual arousal and physiological measures. The first experiment demonstrated that residual arousal maintained self-focused attention when attention was self-directed during exercise. The second study, which is relevant for our purposes, examined self-reports of arousal in relation to actual arousal.

Participants cycled for 5 min on an exercise bicycle. Performance level was either easy (0–5 miles [0–8 km] per hour) or difficult (20–22 miles [32–35 km] per hour). Participants memorized nonsense words while cycling. Heart rate was monitored before cycling (baseline), during exercise, and during the first 2 min after exercise (residual arousal). Participants then completed a questionnaire including a measure of linguistic self-reference (Wegner & Giuliano, 1980, 1983). Additional self-report measures of actual arousal were taken after the manipulations. People were asked to indicate their arousal on a 7-point scale ranging from not aroused at all to highly aroused. (We should note that this self-report measure has both a different scale and a different level of specificity than the heart rate measure of cardiovascular activity.)

In the “forced self-attention” conditions, self-awareness was increased by arranging the cycle's speedometer such that participants saw their videotaped image while monitoring their speed. In the “forced distraction” conditions, self-awareness was decreased below baseline levels. Monitoring cycle speed, memorizing nonsense words, and actually cycling were intended to reduce self-focus from average levels. Similar tactics have decreased self-focus in other studies (e.g., Duval & Wicklund, 1973; Salovey, 1992, Study 2). Unlike past research, then, this study both increased and decreased self-focus. In the forced self-attention conditions, there was a significant positive correlation ( $r = .40$ ) between actual residual arousal (postexercise heart rate) and self-reported arousal. In the forced distraction conditions, the correlation was also positive ( $r = .21$ ) but not significant.

This pattern of correlations seems to support the perceptual accuracy hypothesis. But a serious problem is that correlations are not diagnostic of accuracy. High correlations indicate the strength of association between aggregated distributions, not how closely aligned a single person's responses might be. The mathematics of correlation obscure the within-person information needed to demonstrate within-subject accuracy. This problem has been demonstrated in the study of personality (Lamiell, 1981, 1987). A scale might highly correlate across two testing sessions, but this correlation need not reflect consistency; people could simply be inconsistent in similar ways (Lamiell, 1987). For example, if most people are slightly friendly at Time 1 and extremely friendly at Time 2, the intertrial correlation will be quite high despite the lack of behavioral consistency. Likewise, a group of people might judge a stimulus very differently on different occasions, but the judgments will be highly correlated so long as people are inaccurate in generally similar ways.

The high correlation between actual and reported arousal in the self-focus condition thus has two alternative explanations. Given that people were experiencing similar levels of arousal, self-focus might have led to either an overestimation or an underestimation of actual arousal. So long as the high self-focus group more consistently overestimated or underestimated than the low self-focus group, the correlation between actual and reported arousal would be higher in the high self-focus condition. This is very plausible given the tendency of self-focus to distort other types of self-judgments and judgments of others (e.g., Duval & Wicklund, 1973; Fenigstein & Abrams, 1993; Mayer et al., 1980; Vallacher, 1978; Vorauer & Ross, 1999) and the evidence reviewed thus far showing that high self-focus leads to exaggerated estimates of placebos and actual symptoms (Hull et al., 1983; Levine & McDonald, 1981; L. C. Miller et al., 1981). So long as the self-focused individuals

as a group are exaggerating (or underestimating) their self-reports or arousal, the self-report variable will correlate more highly with measured arousal. In the absence of other measures or analyses, such as “idiothetic” statistics (Lamiell, 1987) or measures capable of revealing accuracy within an aggregate (see Hastie & Rasinski, 1988), no claims for accuracy or consistency can be made, and Hansen et al. (1989) simply would not be able to eliminate these two alternative explanations.

In our reading, this study shows that self-focus influences judgments of internal states. But because a correlation, high or otherwise, cannot in principle reflect accuracy, this study does not show that self-focus makes interoception more accurate. The direction of influence is thus uncertain. The correlation might reflect accuracy, or it might indicate that self-focus biases interoceptive judgments just as it biases other sorts of judgments.

### **Perceiving Current Arousal**

Gillis and Carver (1980) noted that the suggestibility research did not induce or measure actual physiological activity. They thus induced physiological changes and then examined whether self-focus made internal judgments more accurate. Participants rode an exercise bicycle until their heart rate was elevated by 60 beats per minute and then viewed a series of slides. Self-awareness was manipulated by varying the reflectiveness of the slide projection screen; half of the participants were exposed to their reflections between each slide. During this time, participants estimated their heart rate on an 11-point scale. The scales were anchored by asking participants to represent 0 as the resting level and 10 as their heart rate immediately after stepping off the exercise bicycle. These estimates were compared against actual heart rate, which was continuously recorded. Neither dispositional nor situational self-focus influenced the accuracy of heart rate estimations.

An interesting ancillary finding was that people high in private self-consciousness had higher resting heart rates than people low in private self-consciousness. The exercise also had a smaller impact on the heart rates of individuals high in private self-consciousness. This suggests some caveats for researchers interested in how self-focus influences arousal judgments. If the groups differed in baseline arousal levels and susceptibility to arousal inductions, then the dependent measures of arousal ratings might simply reflect these confounded baseline levels or thresholds. Without physiological measures, these differences cannot be controlled statistically.

Weisz, Balázs, and Ádám (1988) also directly compared actual and perceived cardiac activity. Unlike previous studies (Gillis & Carver, 1980; Hansen et al., 1989), the measures of somatic activity and somatic perception were equally specific and thus more comparable. Self-awareness was manipulated within participants through the presence or absence of a mirror. Public and private self-consciousness (Fenigstein et al., 1975) and public and private body consciousness (L. C. Miller et al., 1981) were also measured.

Participants performed two interoceptive tasks. In the heartbeat tracking task, they estimated their current heart rate by tapping a button after each perceived heartbeat. In the heartbeat discrimination task, they heard 15-s blocks of tones that either coincided with or diverged from their actual heart rate. Participants simply indicated whether or not the tones reflected their actual heartbeat; no feedback was given.

The individual differences had no effects on either measure. The lone exception was a high negative correlation between public self-consciousness and heartbeat discrimination. This finding is difficult to explain, although either way it does not support the perceptual accuracy hypothesis. The self-awareness data were also unusual. Self-focus did not enable more accurate reports of the internal cardiac activity; the presence of a mirror had no effect on heartbeat tracking. It did, however, increase the accuracy of heartbeat discrimination. High self-focus led to more accurate recognition of whether the tones reflected actual internal activity. This is a very mysterious finding. Accurately perceiving one's heart rate is the prerequisite skill for accurately recognizing it. Yet, people failed at a sensitive measure of heart rate perception but succeeded at heart rate recognition. If we consider only the second recognition finding, then this study offers limited support for the perceptual accuracy hypothesis: Self-awareness allowed people to better distinguish the “self” from the “nonself” when both options were

presented to them. But if we consider both findings, then something is amiss here. We have no explanation for this pattern, and the original researchers apparently did not see it as a problem.

A recent study included additional dimensions of arousal (Daurer, 1999). Participants made several ratings of systolic and diastolic blood pressure and heart rate. There were several types of measures. Some physiological parameters were assessed on rating scales, and both heart rate and heartbeat tracking were assessed with absolute value estimates. Participants performed two arithmetic tasks that varied in difficulty. There was a 5-min baseline period before each task in which participants received feedback on their cardiovascular values, which were measured continuously. During performance participants were interrupted and asked to judge their cardiovascular activity. Half of the participants sat in front of a mirror during the experiment, and the other half did not. No evidence of perceptual accuracy was found. Cardiovascular activity was, as predicted, stronger during performance of the difficult task than during performance of the easy task (Wright, 1996; see also Gendolla, 1998, 1999b), but neither induced self-awareness nor dispositional self-consciousness affected the accuracy of the judgments of cardiovascular activity.

### **Symptom Perception**

It is interesting that self-focused attention has also been considered to have effects on symptom perception, though in a much different way than the perceptual accuracy hypothesis suggests. Pennebaker's (1982) "competition of cues" hypothesis assumes that "the probability of noticing internal cues can be expressed as a function of the ratio of the quantity or salience of potential internal information to external information" (p. 21). Orienting attention to the self should thus heighten the probability that internal information will enter awareness. Orienting attention to the external world, in contrast, reduces the likelihood that internal information will be noticed.

Pennebaker's hypothesis is very different from the perceptual accuracy hypothesis. Whereas the perceptual accuracy hypothesis concerns perceptual "quality"—it refers to richer self-knowledge through self-awareness—Pennebaker's hypothesis concerns perceptual "quantity." In this view, self-focus does not enable any sort of deep access to internal experience; it simply determines whether or not a somatic process is noticed. Pennebaker found evidence for his assumption in several studies (see Pennebaker, 1982; Pennebaker & Lightner, 1980). This program of research also revealed that people are relatively poor at perceiving somatic processes and arousal states (Pennebaker, 1981; see also Gendolla, 1998, 1999b). In fact, accurate judgments are more likely to be based on the application of valid theories to external information (e.g., a theory of how the difficulty of exercise relates to arousal levels; Fahrenberg, Franck, Baas, & Jost, 1995) than directly accessed somatic activity.

Unlike the suggestibility research, which argued that self-focus enables better access to a wide range of self-aspects, Pennebaker's research suggests that there are strict constraints on access to physiological information. If self-focus can improve perceptual accuracy, it will not necessarily do so unilaterally across physiological indexes. Two studies conducted by Pennebaker and Epstein (1983) measured actual and perceived heart rate, breath rate, and finger temperature. No support was found for the perceptual accuracy hypothesis: Private and public self-consciousness and private and public body consciousness were unrelated to the accuracy of symptom perception on any measure.

Apart from failing to support the hypothesis, Pennebaker's research program makes it seem illogical that self-focus could promote the accuracy of somatic judgments. If people are most accurate when they base their judgments on the external context and valid theories of how external events influence internal states, and not on interoception, then focusing toward the environment and away from the self should be a much more accurate strategy.

### **Linking Inner States and Causal Theories**

So far, we have discussed fairly simple forms of interoception in which people estimate a single physiological parameter. Winkielman (2000) noted that more complex forms of introspection, such as estimating whether a



stimulus affects performance, require both accurate knowledge of internal states and a causal theory about how these states relate to performance. Interoception can thus increase or decrease causal accuracy, depending on the validity of the causal theory that is invoked. If people have an incorrect theory, self-focus may lead to more inaccurate judgments because the theory would be linked to whatever irrelevant internal states are noticed. Participants listened to an audiotaped story that was either normal or beset by background noise and static. People have a shared theory that distracting background noise will detract from their enjoyment, although research shows that distraction does not actually influence enjoyment ratings (Nisbett & Wilson, 1977). This therefore served as the inaccurate theory for the study. Self-awareness was manipulated while participants were listening to the story or while they were completing the dependent measures of arousal, perceived influence of the noise, and enjoyment of the story.

As in past work, people reported that the noise reduced their enjoyment of the story, yet the noise and no-noise conditions did not actually differ in regard to enjoyment. This indicates that people indeed applied an inaccurate theory to their self-reports. High self-awareness, either during the story or during the measures, had no between-groups effects on whether people perceived that the noise influenced their ratings of the story. Within-group analyses showed that those who were self-focused while listening to the story were more likely to erroneously ascribe influence to the noise.

This intriguing study went beyond the other interoception research described in this section by examining how self-focused attention influences complex introspective judgments. If they were self-focused while listening to the story, people were more likely to erroneously connect an internal state with an incorrect state–cause theory. An implication of this research is that even if self-focus enables accurate judgments of internal states, it will not necessarily enable accurate self-judgments if such judgments involve the linkage of states and state–cause relations. Note that we do not need to assume that self-focus provides more accurate information for this to occur. As in Pennebaker's research described earlier, self-focus could instead determine the degree to which people notice an internal state. So long as self-focus leads to more irrelevant information, either through mere noticing or through exaggeration (Hull et al., 1983; Levine & McDonald, 1981; L. C. Miller et al., 1981), it will increase inaccurate linkages of states and theories.

### **Summary of the Interoception Studies**

The studies reviewed in this section attempted to test the perceptual accuracy hypothesis more precisely by inducing actual somatic changes, taking physiological measures, or both. They were thus better tests of the perceptual accuracy hypothesis than the suggestibility and placebo studies described earlier, because they involved an accuracy criterion. Yet, we see inconsistent effects (Reisenzein & Gattinger, 1982), null effects (Daurer, 1999; Gillis & Carver, 1980; Pennebaker & Epstein, 1983), and even effects suggestive of exaggerated and inaccurate judgments (Hull et al., 1983; L. C. Miller et al., 1981). Other research is inconclusive because of the way it indexed accuracy (Hansen et al., 1989), and one lone study (Weisz et al., 1988) showed that self-focus enabled better discriminations between “self and nonself” but not better self-reports of internal activity. We feel justified in concluding that support for the perceptual accuracy hypothesis continues to be unimpressive.

### ***Knowledge of the Affective Self: Perceiving Emotions***

Self-focus is also said to enable more accurate judgments about emotions; highly self-focused individuals are hypothesized to be more aware of and responsive to their affective states (Gibbons, 1983, 1990; Scheier & Carver, 1977). Because affect is presumably more salient under self-focus, people can more accurately assess emotional intensity. This manifests as more intense self-reports of emotion. Note that a disjunction between actual and experienced intensity is being advocated. Proponents of this view (Scheier & Carver, 1977; Scheier, Carver, & Matthews, 1982) explicitly argue that self-focus does not affect actual emotional intensity; it simply allows people to judge emotional intensity more accurately.

Before we consider the evidence, what data would indicate that self-focus increases accuracy of emotion perception? Demonstrating increased accuracy requires two components. Physiological or behavioral measures

must first indicate that high and low self-focus groups are experiencing equal levels of emotional arousal. Self-reported emotional intensity must then differ, with those in the high self-focus condition reporting intensity levels commensurate with the physiological activity. Self-reports of intensity alone are clearly insufficient. If self-focus affected only self-reported intensity, there would be no criterion for accuracy and no grounds for arguing that self-focus was influencing emotional salience rather than actual emotional intensity.

## **Research Evidence**

### Does self-focus amplify emotions?

The first part of the position just described involves whether or not self-focus truly leads to more intense self-reports of emotion. Scheier and Carver (1977, Studies 1 and 3) presented two classic experimental tests of the accuracy hypothesis. In the first study, men were shown slides of nude women and asked to rate the attractiveness of each slide. Self-focus was manipulated with a mirror. High self-focus caused higher ratings of slide attractiveness. This dependent measure is tangentially related to internal states. Indeed, this experiment could simply be described as studying the effects of self-focus on impression formation; its findings are fully consistent with such studies (Davis & Wicklund, 1972; Vallacher, 1978).

The second experiment involved more conventional manipulations and measures. Participants were asked to read the Velten (1968) mood-changing statements and to attempt to induce the mood suggested by the statements. Afterward, participants were seated facing a mirror's reflective or nonreflective side and told to continue generating the mood. They then completed self-report emotion measures. Self-focus increased self-reported negative affect in the negative statements condition. Contrary to predictions, however, self-focus did not influence positive affect in the positive statements condition. If this study shows perceptual accuracy—and we argue subsequently that it does not—it shows a puzzling asymmetry between emotional states; all emotions should be equally salient. 4

Brockner, Hjelle, and Plant (1985) suggested that demand characteristics might be responsible for the increased intensity they found, because participants were bluntly told the study's purpose and instructed to generate a mood. As discussed earlier, self-focus motivates people to adhere to standards and norms (Silvia & Duval, 2001). Scheier and Carver's studies thus confounded the self-regulation effects of self-focus with its presumed salience effects. Brockner et al. sought to test this explanation, but, strangely enough, they used the same procedure, mood induction, and measures as Scheier and Carver (1977, Study 3) and thus retained the same demand characteristics. They did add, however, a weak-versus-strong manipulation of affect; trait self-esteem was also measured.

The findings were mixed and inconclusive. Self-awareness had no impact on negative affect in the strong affect induction condition, and it led to a marginally significant decrease in the weak affect induction condition. Participants were then divided according to high, medium, or low levels of trait self-esteem. Self-awareness had no effect on participants at high and medium levels of self-esteem. In the low self-esteem group, however, self-awareness increased affect in the strong affect induction condition and decreased negative affect in the weak affect induction condition. This study's demand characteristics and inconsistent findings prevent it from addressing the demand explanation for past work. It also cannot address the perceptual accuracy hypothesis because it involved only self-reports of emotions and thus had no comparison point for the assessment of accuracy.

Another study (Silvia, in press-a, Study 1) supported the demand explanation. Participants read a “personal account” designed to induce sadness. Some participants were given an “emotionality standard”; they were told that the study concerned emotional reactions to the accounts, particularly how well people can self-induce the emotion suggested by an account (see Scheier & Carver, 1977, p. 631). Others were not given such a standard; emotions were not mentioned by the experimenter. Self-focus was manipulated with a mirror. Emotion measures showed that high self-focus intensified self-reported sadness when an emotionality standard had been induced. When there was no such standard, however, high self-focus significantly dampened the intensity of sadness.

Additional research showed that self-focus does not have a simple main effect on self-reported emotional intensity (Silvia, in press-b). All known cultures socialize emotional experience, which leads to the many emotionality standards that influence common affect regulation processes (Gendolla, 2000; Gross, 1998; Parkinson, 1995). Self-focus may influence emotional intensity only inasmuch as people are regulating their emotions according to a relevant emotionality standard. As a means of testing this possibility, people were preselected on the basis of their standards concerning free expression versus inhibition of emotional states. After an induction of happiness, self-awareness was manipulated with a mirror. As expected, high self-focus dampened happiness among people who believed that emotions should be inhibited; self-focus had no effect on people who believed that emotions should be freely expressed.

In sum, there is little support for the assumption that self-focused attention leads to amplified self-reports of emotion. Studies showing this effect had demand characteristics that would also create higher self-reported emotion (Silvia, in press-a). Other studies show that self-focus can lead to attenuated intensity or no change, depending on a person's emotion standards (Silvia, in press-b). We now consider the argument's second step: whether self-focus makes judgments more accurate.

#### Are emotions judged more accurately?

None of the preceding studies met the criteria as a test of the accuracy hypothesis. Without physiological or behavioral measures of comparison, there is simply no justification for Scheier and Carver's (1977) assertion that self-focus influences the accuracy of emotion judgments and not actual intensity. But other experiments meet our criteria as tests of the accuracy hypothesis. Kleck et al. (1976) administered electric shocks to male participants. Self-reported pain intensity, skin conductance, and facial expressions were measured. In Study 1, participants were observed by a woman behind a one-way mirror during half of the trials; this procedure reliably induces self-focus (Carver & Scheier, 1978). Self-reported pain intensity, autonomic arousal, and facial expressivity were all significantly less intense when participants were observed. A second study included both male and female observers. All three measures of pain were again significantly less intense when an observer was present; the observer's gender had no effect.

Two experiments conducted by Lanzetta, Biernat, and Kleck (1982) also qualify because they involved measures of self-reported affect, autonomic activity, and facial activity. In Study 1, exposure to a mirror significantly reduced self-reported negative affect. Measures of skin conductance and facial expressivity showed similar, though nonsignificant, declines. In Study 2, high self-focus had a nonsignificant dampening effect on self-reported positive and negative affect and a marginally significant dampening effect on facial expressions. Although these results were largely nonsignificant, they roughly replicate the findings of Kleck et al. (1976).

These studies cast serious doubt on the perceptual accuracy hypothesis in regard to emotions. If self-focus was increasing the accuracy of emotion perception rather than actual emotional intensity, then the conditions would have differed on self-reports but not on physiological measures. However, self-focus dampened self-reported pain as well as autonomic and facial measures of pain. This shows that self-focus is influencing the actual intensity of the emotional state. We can thus conclude that the high and low self-focus groups are equally accurate in their judgments; they are simply judging differentially intense emotions.

#### **Emotion Summary and Discussion**

The perceptual accuracy hypothesis, as applied to emotions, encounters two problems. First, it assumes that self-focus makes emotions more salient, which then manifests as greater self-reported intensity. There is no reliable evidence that self-focus increases self-reported intensity (Silvia, in press-a, in press-b). Second, the accuracy hypothesis assumes that self-focus influences the salience of an emotion but not the actual intensity. Autonomic and expressive data indicate, to the contrary, that self-focus modifies the actual intensity of emotion (Kleck et al., 1976). We should note that the perceptual accuracy hypothesis does not necessarily need to posit that self-focus affects only an emotion's salience. This is simply the only version that has been proposed thus

far; a modified accuracy hypothesis may eventually be supported. For example, self-focus might make people more aware of their emotions while also attenuating emotional intensity. Perhaps people are judging the less intense emotion more accurately. This appears to be a promising possibility for future research.

### *Accuracy in Perception of the Self as a Causal Agent*

Self-focused attention is also said to promote accurate causal attributions: “Self-attention might also increase the accuracy with which people assess their own role in a given situation or their own contribution to a particular outcome” (Gibbons, 1990, pp. 255–256). This area is slightly different from the others. Instead of clarifying the experience of a concrete somatic state, self-focus is said to make the outcome of a mental process more accurate. This might occur for several reasons. Self-focus may lead to a more accurate mustering of initial causal candidates, or it may lead to a more accurate assessment of a given candidate's responsibility.

Before evaluating the evidence, how can we know whether an attribution is accurate? The dominant method is to compare the attributions made by participants and observers. Observers are presumably less ego involved than participants and thus less vulnerable to self-serving biases (W. K. Campbell & Sedikides, 1999). Yet, this method has serious problems. Observers may have their own motivational biases. Whereas the participant's attribution may reflect self-enhancing motives, the observer's attribution may reflect a desire to appear incisive or fair to the experimenters. The observer and actor may also share heuristics and informational deficits that would lead to equivalent inaccuracies. People are poor in regard to perceiving certain mental processes (Nisbett & Wilson, 1977). A high actor–observer correspondence can thus simply reflect mutual ignorance or shared “public theories.”

But the most serious problem with using observers as the benchmark for accuracy is the well-known “actor–observer bias” (Jones, 1990). If an actor makes an external attribution for failure but observers make an internal attribution, then the actor's attribution would be considered inaccurate (e.g., Snyder, Stephan, & Rosenfield, 1976). But this is the exact pattern found in the actor–observer bias: The actor is attributing to situations or transient states (Jones, 1990; White & Younger, 1988), whereas the observer is attributing to stable dispositions. Who, if anyone, is making an accurate judgment? And how would the researcher, who is also an observer construing another's actions (Kelly, 1955), know?

Another method for establishing accuracy is to construct a situation such that one attribution seems most plausible. For example, one can baldly tell participants that a task reflects a person's abilities and skills. This method is also imperfect. There is no way to know whether the participants construed the situation as the researchers intended. This also implies a very different sense of “accuracy.” An accurate attribution ceases to be the “true cause” and becomes the socially consensual attribution promulgated by the authority figure. The experimental tasks are designed to be unfamiliar, ambiguous, and difficult; persuasive false failure feedback could not be given otherwise. The participant genuinely is not the cause of failure, and an external attribution is thus most accurate. Yet, this attribution differs from the researcher's intended socially consensual attribution and is thus inaccurate. An analog is modern IQ testing. A member of a disadvantaged group who attributes a low score on an IQ test to “low mental ability” is in one sense “accurate”; the attribution conforms to the prevailing social model of IQ. But the low score might really be due to test bias or a sense of stereotype threat and may only marginally reflect “mental ability.” If so, an external attribution would be most accurate. This is yet another stumbling block in assessing attributional accuracy.

### **Research Evidence**

With these problems in mind, we turn to the empirical evidence. Duval and Wicklund (1973) were the first to suggest that attention influences attribution. Heightened self-focus was expected to increase internal attributions, presumably because focusing attention on an object makes it seem more likely as a possible cause (Pryor & Kriss, 1977). Participants made causal attributions for positive and negative hypothetical scenarios. High self-focus led to greater self-attribution, regardless of scenario valence. These studies were not intended to address attribution accuracy. Indeed, because there was no actual event, the causal attribution data cannot be construed as either accurate or inaccurate.

Later research suggested that self-focus can lead to defensive external attributions, which are allegedly inaccurate. Heightened self-focus amplifies experiences of self-discrepancies: Failure is more distressing, and success is more pleasing (Ickes et al., 1973). Federoff and Harvey (1976) suggested that self-focused people may make external attributions for failure events to avoid amplified negative affect. In their experiment, participants provided therapy to an ostensibly phobic confederate; some were told they had succeeded or failed. When self-focus was high, participants attributed failure externally. A later study produced similar results (Cohen, Dowling, Bishop, & Maney, 1985).

A study conducted by Gibbons et al. (1985) asked individuals with clinical disorders to report on aspects of their health problems. Self-focus led to more accurate reports of hospitalization history than hospital records and staff judgments. Contrary to predictions, however, attributions were not affected: "Self-focused attention did not increase patients' acceptance of responsibility for the determination of their problem or for participation in their treatment" (Gibbons et al., 1985, p. 672). The null finding aside, this study poses special problems for determining attribution accuracy. It is simply incorrect to assume that an internal attribution for a clinical disorder is the accurate attribution. Science simply does not know the causes of some disorders, so attributional accuracy cannot be assessed. Disorders also differ in their typical causes. One person's internal attribution for alcoholism may be accurate, whereas another's internal attribution for depression may be inaccurate. Indeed, disorders such as alcoholism can legitimately be attributed to both internal and external factors. And even if self-focus made each participant entirely accurate, the sample's heterogeneity would probably obscure mean differences. We thus view this study as inconclusive above and beyond the null effect.

Recent studies by Duval and Silvia (in press) were not intended to address accuracy, but they concerned whether or not self-awareness has a general effect on attribution. Participants worked on mental rotation tasks; success and failure were said to reflect a person's true ability in three-dimensional problem solving. In a first set of studies, participants were told that their performance on the task was substandard. Half were further told that they could rapidly improve, whereas the other half were told that their chance of improving was slim. Self-focus was manipulated with the presence or absence of a video camera. Participants low in self-focus did not differ in their attributions. Participants high in self-focus, however, attributed failure internally when they expected to improve and externally when they did not expect to improve.

### **Attribution Summary and Discussion**

Most of the studies described in this section were not designed to test the accuracy hypothesis. Some studies do not inform the accuracy issue because they involved hypothetical scenarios (Duval & Wicklund, 1973) or did not reveal effects of self-focus (Gibbons et al., 1985). The remaining research shows that self-focused attention does not have a main effect on attribution; the perceived ability to improve moderates internal and external attributions (Duval & Silvia, in press). None of the studies included a criterion enabling a firm assessment of accuracy.

What does this research mean for self-focus and attributional accuracy? We reject the assumption that external attributions are necessarily inaccurate. Psychologists should not fall prey to the actor–observer bias, an effect that itself relies on Western cultures (J. G. Miller, 1984; see also Gendolla, 1999a), by assuming that all action is internally driven. And, as discussed earlier, it is simply too difficult to know whether or not an attribution is accurate. If self-focus does not have a general main effect on attributions (Duval & Silvia, in press), and if attributional accuracy cannot be measured anyway, characterizing self-awareness and attribution in terms of accuracy is fruitless.

### ***Summary and Considerations for Future Research***

We have offered a contrarian view of the perceptual accuracy hypothesis. The notion that self-focused attention promotes rich and accurate knowledge of the self is widely believed, yet a close look at the literature reveals very little support. The handful of studies typically cited in connection with this hypothesis (Gibbons et al., 1979; Gibbons & Gaeddert, 1984; Scheier et al., 1979) offer not direct support and have alternative

explanations that are directly supported. And a broad look at the research reveals a host of null effects, unusual and inconclusive data, and even many contradictory results. It thus cannot be argued that “the literature as a whole” supports the perceptual accuracy hypothesis; indeed, we believe that the reverse is true. We have not argued, however, that self-focus cannot conceivably increase the accuracy of self-judgments. Past research has failed to test the hypothesis properly, for a variety of reasons. Future research will need to be sensitive to several methodological and conceptual issues that we briefly highlight here.

### **The Logics of Accuracy Research**

Research on the accuracy of personal introspections has been strangely vigorous; accuracy is nearly taboo in other areas of psychology. The vast literature on stereotyping, for example, has historically avoided the issue of accuracy, and for good reason. Demonstrating that a stereotype—a personal judgment of a population distribution—is accurate or inaccurate requires an extensive amount of conceptual and methodological sensitivity (Judd & Park, 1993). And only a few intrepid personality psychologists have confronted the thorny epistemological issues surrounding the accuracy of personality judgments (Funder, 1995).

Yet, the interest in introspective accuracy has exceeded the sensitivity to methodological issues. Foremost among these issues is the logic of establishing the accuracy of a judgment. Arguing that a judgment is accurate is not something that psychologists typically strive to do. Special methods are required to demonstrate accuracy or inaccuracy, and past tests have generally failed to employ them. Hastie and Rasinski (1988) recommended an approach to accuracy that “involves a direct comparison between a judgment response and criterion value measured independently of the subject's judgments” (p. 196). Without an independent criterion, no claims of accuracy or inaccuracy can be made, regardless of how intuitive and compelling the indirect evidence might seem. Many of the studies of perceptual accuracy fall into this category.

After establishing a criterion, researchers need to justify why it is a meaningful benchmark for the assessment of accuracy. This is usually fairly straightforward when testing the perceptual accuracy hypothesis; actual physiological indexes are meaningful criteria when the same physiological indexes are being judged. Yet, sometimes the criterion is less easily justified. Attributional accuracy, for example, is very difficult to index. Using observers' attributions is poor because there are many reasons why observers and actors would make similar or different attributions. Simply differing from the researchers' attributions, such as making an external attribution for one's clinical problem (Gibbons et al., 1985), is another poor criterion for attributional accuracy. Although less pressing than the other methodological issues, this point should be explicitly addressed in future work.

A final methodological consideration is how researchers should best index judgment accuracy. Hastie and Rasinski (1988) recommended within-person comparisons of the judgment and criterion:

If the judgments and criterion are measured quantitatively, then a judgment–criterion discrepancy index is frequently the basis for a summary of judgment accuracy. If the criterion and judgment are expressed in a categorical form (e.g., yes–no, present–absent), then usually several trials are performed and accuracy is indexed by the proportions of various types of correct and incorrect response. (p. 196)

This method is important because it avoids the use of correlations. These are widely believed to reflect within-person accuracy, yet they reflect only whether two variables are related at the population level. High correlations can thus reflect high, low, or negative levels of accuracy (see Lamiell, 1981, 1987). Of the studies that included a criterion, only one (Weisz et al., 1988) assessed accuracy in this manner. Future work needs to follow this logic to make a compelling case.

### **“Honesty Standards” as a Source of Accuracy**

Some views of the perceptual accuracy hypothesis assign a large role to honesty standards. Gibbons (1990), for example, argued that self-focused attention increases access to self-relevant information, inhibits exaggerated self-reports resulting from impression management, and increases the motivation to provide honest and accurate



self-reports. People, in short, want “to tell the truth”: Self-focus will thus lead to more veridical self-reports because self-focused people do not want to violate this standard by lying to another.

Yet, assuming that honesty is a universally internalized standard is problematic. Everyday experience suggests that honesty standards are not as ubiquitous as we might like. In fact, many standards concern the importance of dishonesty; “white lies” are important facilitators of social interactions in some cultures. We also doubt that honesty standards are global. People feel obligated to be fully honest when counting change, “diplomatic” when commenting on a friend's new haircut, and deceitful when asked about a friend's ugly newborn. The global–local distinction is important; if honesty standards are local and specific, then they may or may not lead to more accurate self-judgments. People probably feel obligated to be honest when reporting certain dimensions such as religion and political values. But honesty standards probably do not deter exaggerated reports of income, age, and certain bodily features.

And even if honesty is the best policy, it certainly is not the only policy. People have many goals and standards that are simultaneously relevant. A recent study on moral hypocrisy showed that principled motives such as honesty and fairness are not the default standards (Batson et al., 1999). Participants were asked to allot rewards to themselves and another participant. If no fairness standard was explicitly activated, the high self-awareness group was less likely to give rewards to the other person than the low self-awareness group. These people resolved the inconsistency by changing their fairness standards to be congruent with their actions (Duval & Lalwani, 1999).

We thus see a role for honesty standards in the accuracy of self-reports, but we do not see them as fundamental and pervasive. Internalized standards are so idiosyncratic that we doubt that global honesty standards are shared by all people. Future work should take a more differentiated view of honesty standards, either by selecting people on the basis of existing standards or by creating judgment contexts that are more or less relevant to prevailing norms about honesty.

### **Differences in the Awareness of Self and Object**

As described earlier, the perceptual accuracy hypothesis relies on more general principles of attention and object perception. Attention clarifies our experience of an object: The boundaries between the object and the background become sharper, the details of the object become more apparent, and memory for the object's features improves. In short, attention enables more accurate perceptions and judgments of the object. The perceptual accuracy hypothesis assumes that self-perception and object perception are dynamically identical. Focusing on oneself should thus have essentially the same cognitive consequences as focusing on a futon.

Yet, self-focus and object focus involve fundamental differences. Unlike object awareness, self-awareness is essentially continuous; it ebbs and flows, but it is terminated only during losses of consciousness. The experience of a kitchen table, in contrast, is continuous only inasmuch as the person continues to perceive and represent it. Self-experience is also unified in ways that object experience is not. Objects can strike us as fragmented, meaningless, and incomprehensible, though never wholly so (Berlyne, 1971). The conscious experience of oneself, in contrast, results in a remarkably unified and coherent experience, except in certain atypical states of consciousness. And perceiving an object does not usually change the object in any meaningful way. This is why people can independently agree on the color of a house or the dimensions of a book. Yet, focusing on the self changes the content and experience of the self. High self-focus leads to self-evaluation; people begin thinking about their actions in relation to their standards (Scheier & Carver, 1983). Perspective taking increases (Stephenson & Wicklund, 1983), existing emotional states may be changed (Csikszentmihalyi, 1990; Silvia, in press-a), others are perceived differently (Vallacher, 1978), and people subjectively feel “manipulatable” (Duval & Ritz, 1972; May, 1967) and extrinsically motivated (Plant & Ryan, 1985).

The relation between self-perception and object perception has interested philosophers for some time. Bertocci (1988), for example, argued that our experience of self—the “self-identifying unity–continuity”—is unlike all other experience. The reason is that self-experience is the prerequisite for all conscious experience:

My experiencing of myself as self-identifying unity-continuity is like no other situation because what we might speak of as the object of awareness is simply not an object among objects, not an activity among activities, at all; without it, as complex unity of activities, there would be no “objects” or “objectives” or activity-potentials. (Bertocci, 1988, p. 15)

Consciousness can apprehend other objects, but it can no more apprehend itself than a knife can be used to whittle itself.

These considerations do not necessarily suggest that self-focused attention cannot enable accurate self-knowledge; self-focus might change the content of self, for example, yet also enable better knowledge of the modified self. They very clearly suggest, however, that the core assumption of the perceptual accuracy hypothesis—that self-perception and object perception are dynamically identical—is simply incorrect. One does not simply “look inward” as one looks into a shop window; self-perception and object perception differ in fundamental and insurmountable ways (Bertocci, 1988). Later work will need to develop a different conceptual cornerstone for the perceptual accuracy hypothesis.

### **Judging Constructed and Plural Selves**

The final, and perhaps most pressing, conceptual issue for future work concerns the nature of the self that is said to be more accurately judged. The prominent theory of self in psychology has been the “single, unified self” (Raggatt, 2000). Psychological development is viewed as a unification process whereby loose strands of experience are woven into a coherent identity (e.g., Allport, 1961) or the residues of socialization are scrubbed away to reveal the core self (e.g., C. A. Campbell, 1957; Maslow, 1954; May, 1967; Rogers, 1961). The modern incarnation is the cognitive model (Hermans, 1996), which posits a complex and integrated system of information (Kihlstrom & Klein, 1994). Inconsistencies and local disorders are resolved as the system becomes increasingly organized, yielding a unified mental model of the self.

The logic of accuracy is not overly problematic within this model; some aspect of the self serves as the criterion, the participant judges that aspect, and the judgment and criterion are compared. But other models of selfhood are less compliant. Dialogical theories of the self (Hermans, 1996; Raggatt, 2000) most explicitly reject the unified, coherent, vectored, executive self. Instead, the self is seen as a landscape of voices, some consistent, some conflicting, some unrelated. These models identify the self as a collection of multiple and dialectical narratives rather than as the outcome of converging integration and unity; the life story has given way to the life stories. This general position is also found in sociological theories of identity (Shibutani, 1961), research on the spontaneous self-concept (McGuire & McGuire, 1988), and constructivist self-theories more broadly (Lewis, 1997).

If each contradictory facet of the self is equally authentic, assessing the accuracy of a self-judgment becomes a curious affair. If a person truly can both like and dislike foreigners, be both pro-religion and anti-religion, and be both compassionate and selfish, it is difficult to know what to use as the criterion trait for accuracy. If the self is defined as possibilities rather than static actualities, there is no fixed thing to be judged. Criticisms of dialogical and constructivist models of the self can certainly be made; our goal here is not to argue for one perspective over another. We only wish to highlight that not all theories of the self are equally amenable to ideas of accuracy. The traditional “self as unified object” model that has dominated Western thought (and Western psychology) is quite congenial to assessing accuracy; contemporary “self as dialectic and polyphony” models are not.

### ***Implications for Theories of Self-Awareness***

As noted earlier, the psychology of self-awareness is a collection of theories with different assumptions and emphases. The perceptual accuracy hypothesis is one of their unshared assumptions, and its validity thus differentially affects the theories. OSA theory (Duval & Silvia, 2001; Duval & Wicklund, 1972; Silvia & Duval, 2001) is unaffected by our conclusions. It does not make claims regarding accuracy; it instead assumes that self-evaluation is the link between the introspective standpoint on the self and experience and activity. If consistency

motivation is sufficient to explain the accumulated literature, then there seems to be no need to add a parallel or intersecting accuracy process.

Hull and Levy's (1979) encoding model suffers yet another blow from our conclusion. They argued that somatic states are self-relevant stimuli, inasmuch as they contain information about how the self relates to the environment. Heightened self-awareness should thus lead to the encoding of somatic states, which then strengthens the link between the information and behavior. Their theory does not rise and fall on perceptual accuracy, but the generality of the supposed encoding process is questioned. If not all self-relevant stimuli receive encoding and accrue its consequences, then the concept of a "particular form of encoding" devoted to self-relevant stimuli seems even more suspicious.

Our conclusions also raise questions for Carver and Scheier's (1981, 1998) control theory model. It is difficult to imagine how a self-regulating system could function efficiently unless the inputs and goal states could be clearly discerned. This approach thus relies heavily on the perceptual accuracy hypothesis. Self-focused attention presumably leads to a tighter alignment of current activity with a goal because it accurately clarifies their relative positions. Yet, if self-focus leads to altered rather than accurate perception—if it exaggerates or biases self-perceptions—then we have a strange self-regulating system. The initiator of self-regulation, the mechanism that is supposed to control and organize behavior, would be biasing the inputs into the system and thus leading to comparisons with inappropriate goal states.

Our interpretation affects Gibbons's multilevel model of self-attention most seriously. This theory assumes widespread accuracy effects of self-awareness and thus does rise and fall on the validity of the perceptual accuracy hypothesis. When attention is focused on the experiential level, affect and somatic states will be perceived more accurately. This is the only effect of self-focus on this level. Without perceptual accuracy, the theory has no way of linking attention to experiential level to any subsequent activity, such as greater state-behavior correspondence. Attention to the other levels also increases accurate causal attributions and attitude assessments. Indirect contributors to accuracy at these levels are "honesty standards," which we discussed earlier. Removing perceptual accuracy removes this model's main mechanism.

Mini-theories of self-focus and psychopathology will need to be evaluated individually and in more detail than we can provide here. Some do not rely on perceptual accuracy (Baumeister, 1990); others incorporate the concept but could easily stand without it (e.g., Pyszczynski & Greenberg, 1987). Overall, it would do this area good to consider the necessity of perceptual accuracy for each model. If self-focus leads people to exaggerate or construct symptoms, as our interpretation suggests (Hull et al., 1983; Levine & McDonald, 1981; L. C. Miller et al., 1981), then many models can be reinterpreted. Panic disorder, for example, can be intersected with self-focus in several ways. Models of panic disorder have generally assumed that self-focus lets the person know "what's there," and the person then reacts with maladaptive cognitions (see Wells & Matthews, 1994). Instead, self-focus might bias the original judgment; it could lead people to construct new symptoms and exaggerate the perceived intensity of a somatic process. Whereas later cognitive processes are obviously crucial, self-focus might play an initially biasing role that is compounded, not biased, by subsequent cognizing. Likewise, reducing self-awareness might help test anxiety because it reduces awareness of anxious feelings and symptoms, but perhaps it instead eliminates the cause of anxiety, self-evaluation. Evaluating these different theories is a worthwhile task for later work.

### *Coda*

Many psychologists are skeptical of the value of self-reports. If people have little access to internal states (Bem, 1972), or if they simply base self-judgments on shared public theories (Nisbett & Wilson, 1977), then psychologists should not expect self-judgments to be very accurate. This skepticism has been tempered by an interest in possible moderators of accuracy. Certain dispositions and states are said to enable more accurate (or perhaps "less inaccurate") reports of internal events. Introspection, conceptualized as self-focused attention, is probably foremost among these moderators. The prevailing view posits, in the rationalist spirit of "seek and ye shall find," that self-reflection is the key to true self-knowledge. We have argued that there is little compelling

evidence for this position; the process of introspecting might change the self that is viewed instead of simply exposing what was there all along. Future work will need to be more sensitive to the logic of demonstrating accuracy as well as the broad effects of self-focus on the content and experience of the self.

### *Footnotes*

1 In this review, we consider both situational and dispositional forms of self-focused attention. We often describe situational self-focus as “high” or “low”; this is a shorthand for relative positions on a continuum of self-focused attention and does not represent distinct categories or the continuum's endpoints. We also treat private self-consciousness (Fenigstein, Scheier, & Buss, 1975) as unitary, although some researchers have recently argued for two subfactors, usually labeled “internal state awareness” and “self-reflectiveness.” Although much has been made of this finding, there are good reasons to doubt its significance (Silvia, 1999). First, this is not actually a discovery, as “nothing can come out of factor analysis that was not first put into it” (Allport, 1961, p. 330); the private self-consciousness construct is not defined by its most popular measurement tool. Furthermore, the two subfactors have very inconsistent correlations with each other (between 0 and .6) and with certain outcomes; some items also inconsistently load on either factor (Creed & Funder, 1998, 1999; Silvia, 1999). And enthusiasts of this distinction have yet to satisfactorily respond to contrary data. Some studies have shown that the two-factor structure is an artifact of differential endorsement rates and variances (Bernstein, Teng, & Garbin, 1986) and that the factors fail to meet more rigorous requirements, such as simple structure (Britt, 1992).

2 We might also consider “self-concept clarity” under the category of attitude judgment (J. D. Campbell et al., 1996). Inasmuch as perceptual clarity is a condition for perceptual accuracy, we would expect self-focus to increase self-concept clarity, “the extent to which the contents of an individual's self-concept ... are clearly and confidently defined, internally consistent, and temporally stable” (J. D. Campbell et al., 1996, p. 141). Yet, private self-consciousness is negatively correlated with scores on a self-concept clarity scale; self-reflection apparently muddies the waters. This would be damaging to the perceptual accuracy hypothesis were it not for the questionable nature of dispositional self-concept clarity. By the very definition of the construct, how could people with low self-concept clarity offer reliable reports of their levels of self-concept clarity? There is also no criterion for accuracy. And, indeed, demonstrating the accuracy of self-reported dispositional accuracy is a neat methodological challenge.

3 Another placebo study (Brockner & Swap, 1983) focused on individual differences in a replication of the Storms and Nisbett (1970) insomnia experiment. Insomniacs who were more attentive to bodily processes were expected to stay awake longer with an arousing placebo and fall asleep earlier with a relaxing placebo. In contrast, insomniacs who were more attentive to external stimuli were expected to fall asleep earlier with an arousing placebo and stay awake longer with a relaxing one. The underlying logic was that individuals who are more sensitive to external information should be particularly vulnerable to it. Trait variables were self-esteem, self-consciousness, and body consciousness; the placebo was ostensibly arousing or relaxing. In the arousing placebo condition, people scoring high on private body consciousness stayed awake longer than those

4 Many experiments are relevant to this hypothesis but are not reviewed here. Some studies simply failed to show effects on self-reported emotion (Berkowitz, 1987; Scheier, Carver, & Gibbons, 1981, Study 1). Others induced an emotion by creating a self-discrepancy (Carver, Blaney, & Scheier, 1979; Scheier, 1976). Emotions induced in this way will become more intense because self-focus exacerbates the experience of self-discrepancies (Ickes et al., 1973). These studies are inadequate tests of the perceptual accuracy hypothesis because the heightened intensity might simply reflect self–standard comparison instead of heightened emotion salience. Private self-consciousness is also associated with emotional intensity (Scheier, 1976; Scheier & Carver, 1977, Studies 2 and 4; Scheier et al., 1981, Study 2). Later research showed that this effect is due to confounded variables, particularly depression (Ingram, 1989, Study 1) and neuroticism (Silvia, in press-a, Study 4), so it is not discussed here. These issues and experiments are extensively reviewed elsewhere (Duval & Silvia, 2001).

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