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Source Monitoring as an Explanation for the Illusion of "Self as Subject"

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One's experience of self as a "subject of consciousness" or an observer who is conscious of sensory objects, and simultaneously conscious of itself, is an illusory experience that results from the physical and subjective aspects of source monitoring. Physically, one's nervous system monitors whether the innervation of one's sensations is peripheral or central in origin, so long as such source monitoring is not diminished by sleep, hypnosis, dissociation, psychosis, or subliminal innervation. Subjectively, the neural monitoring of sensations with a peripheral source is paralleled by the tacit knowledge that one is perceiving, whereas the neural monitoring of self-generated sensations with a central source is paralleled by the tacit knowledge that one is imaging. Most importantly, the meta-awareness that one is perceiving sensations or that one is imaging sensations gives rise to the generic experience that one is "having" sensations—that is, to the illusory experience of a "self as subject" which has, not is, its sensations. This source-monitoring explanation for the illusion of an "observing self" is initially introduced in the context of historic approaches to the problem of self and, then, is fully described and discussed in the context of empirical research.

Keywords: self as subject, source monitoring, hallucinating, dissociating, subconscious perceiving

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William James' (1892/1961) book concludes by asserting that the "relations of the known and the knower are infinitely complicated" and that the "path to understanding them lies through metaphysical subtlety" (p. 333). This article begins by reconstructing the metaphysical context in which James made this assertion.

History of the Psychological Problem of "Self as Subject"

Psychophysical, psychological, and psychophysiological studies of the conscious mind became possible only after Gottfried Leibniz (1765/1896) and Gustav Fechner (1860/1966) laid the foundations for a theoretical alternative to Cartesian dualism. René Descartes (1641/1988) conceived of the human soul as a nonphysical and nonextended "subject of consciousness," which is conscious of physically extended "objects of consciousness" and is self-conscious (i.e., conscious of itself as "subject") whenever it is conscious of objects. Arguing that neither an immaterial soul nor any sort of physical entity can be conscious of objects outside itself, Leibniz reconceived the soul as a nonphysical but subjectively extended set of "monads," which are subjectively manifested as an introspectable "bundle of sensations" and which can be, but need not be, accompanied by the illusory sense of a "self as subject" apperceiving them. Ultimately, Leibniz's anti-Cartesian version of substance dualism was reconceived in terms of aspect dualism, when Fechner argued that particular sensations are the subjective aspects of particular neural states. At the same time, an important detail of Leibniz's anti-Cartesian argument—that no self-con-

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scious "subject" is conscious of "petites perceptions" or, by implication, any other perceptual sensations—was scientifically substantiated when Fechner's psychophysical equation and psychophysical experiments demonstrated the existence of subliminal sensations: "conscious" sensations below the limen, below the "absolute threshold" for the emergence of self-awareness that one is perceiving sensations.

Thus, on one hand, Leibniz's and Fechner's work showed that Descartes was wrong to assert that the mind is a subjectively nonextended "subject of consciousness" not amenable to introspective study or any other scientific study. But on the other hand, their work laid the foundations for the problem of explaining the illusory experience of "self as subject" or the psychological phenomenon of "I-ness"—a core problem addressed by William James (1890, 1892/1961) during psychology's early years, but a problem frequently misunderstood and more frequently ignored by psychologists ever since.

In James's (1892/1961) chapter on "The Self," he distinguished "me-ness"—the self as object or "self as known"—from "I-ness"—the self as subject or "self as knower." And concerning the "self as knower," James asked, "Is it the passing state of consciousness itself, or is it something deeper and less *mutable*?" (p. 63), then on the same page made the pursuant observation: "Each of us spontaneously considers that by 'I,' he means something always the same. This has led most philosophers to postulate behind the passing state of consciousness a permanent Substance . . . [a permanent] 'Soul,' 'Transcendental Ego,' [or] 'Spirit'" (p. 63).

In opposition to philosophers who substantively identify the "self as knower" with a permanent homunculus that is conscious of "objects of consciousness," James (1892/1961) functionally identified the "self as knower" with "the passing state of consciousness itself":

> Yesterday and today's states of consciousness have no *substantial* identity, for when one is here the other is irrevocably dead and gone. But they have a *functional* identity, for . . . each pulse of consciousness dies away and is replaced by another, yet that other, among the things it knows, knows its own predecessor and . . . greets it, saying: "Thou art *mine,* and part of the same self with me." . . . It is this trick which the nascent thought has of immediately taking up the expiring thought and "adopting" it, which leads to the appropriation of most of the remoter constituents of the self. (pp. 69–72)

By implication, subconscious ideas—conscious sensations unaccompanied by the illusion of a permanent "self as subject" having them—are not possible, inasmuch as conscious ideas unaccompanied by the "trick" of memorial appropriation and functional identity are not possible, as James (1890) noted:

> There is only one "phase" in which an idea can be, and that is a fully conscious condition. If it is not in that condition, then it is not at all. Something else is, in its place. The something else may be a merely physical brain-process. (p. 173)

Hence, on theoretical grounds, James was not only dismissive of Helmholtz's (1911/2005) "unconscious inferences" or "unconscious conclusions" (pp. 164, 169), but also dismissive of Leibniz's "petites perceptions" and Fechner's subliminal sensations.

And based on similar theoretical reasoning, James (1890) described dreams not as visually imagined sensations unaccompanied by I-ness, but as nocturnal me-defining mental objects that are disassociated from the wakeful me-defining mental objects with which they alternate daily: "In dreams we forget our waking experiences; they are as if they were not. And the converse is also true. . . . We thus have, within the bounds of healthy mental life, an approach to an alternation of *me's*" (p. 373).

Let us now consider an alternative to James's appropriation-based and Descartes's soul-based theories of "self as subject," an alternative that allows for subconscious sensations—dreamt sensations imagined during attenuated self-consciousness, as well as subliminal sensations and dissociative sensations perceived without any sense of a self-conscious subject "having" them.

Source Monitoring as an Explanation for the Illusion of "Self as Subject"

According to Kunzendorf's (1987, 2000, 2015, ch. 4) theory of source monitoring, the illusory experience of self as "subject of consciousness" is the subjective aspect of neurally monitoring whether the innervation of particular sensations is peripheral or central in its source. This illusion of "self as subject" is manifested, specifically, as either the tacit knowledge that one is perceiving sensations or the tacit knowledge that one is imaging sensations, and generically, as the tacit self-awareness that

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one is "having" sensations. Such tacit knowledge is the relational knowledge of sensations' central or peripheral or generic origins. And most importantly, the neural source-monitor underlying this knowledge is not conscious of sensations or their source of origin. Rather, while physically monitoring the peripheral source of particular sensations, the brain's source-monitoring mechanism is subjectively paralleled by the tacit knowledge that these sensations should be treated as externally generated or perceived. And while physically monitoring the central source of other sensations, the brain's source-monitoring mechanism is subjectively paralleled by the tacit knowledge that these other sensations should be treated as self-generated or imagined. And finally, while physically monitoring either the peripheral or central source of sensations, the brain's monitoring mechanism is subjectively paralleled by the generic knowledge that all monitored sensations should be treated as "belonging to oneself"—and by the resulting illusion of a "self as subject" having those sensations.

Thus, in Kunzendorf's source-monitoring theory, unlike most theories of self-consciousness, the experience of "self as subject" has a function—a reality-testing function—so long as the sensations to be monitored are not too faint or too brief or too near the fringe of the visual field, and so long as the brain's source monitor is not rendered inoperative by a sleep state or hypnotic state or psychotic state or dissociative state. Let us now examine the empirical evidence in this regard.

Empirical Research on the Source-Monitoring Theory of "Self as Subject"

Kunzendorf (1980, Experiment 3) developed a research paradigm for real-time studies of source-monitoring during the normal state of self-consciousness, compared with the states of hypnosis, psychosis, and dissociation. On each trial of this paradigm, individually tested research subjects looked at a fixation point, visually perceived a pictured word or figure on one side of the fixation point, and visually imagined the same word or figure on the other side of the fixation point. Then, while continuing both to view and to imagine the pictured stimulus, subjects rated their image's vividness on a scale from 1 (*extremely faint, if any image at all*) to 5 (*as vivid as the perceived stimulus*). Shortly after rating their image's vividness and while continuing to view and imagine the stimulus, subjects received either a signal denoting that they should quickly but accurately indicate whether the perceived stimulus was on the right or the left, or another signal denoting that they should quickly but accurately indicate whether the imagined stimulus was on the right or the left. A timer measuring percept–image discrimination times was triggered by the onset of either signal and was stopped by the onset of either indication. From trial to trial, the visually presented stimulus and its side of presentation were changed quasi-randomly. Based on each subject's trials (excluding warm-up trials), a within-subject regression line was computed for the trials' percept–image discrimination times over the trials' image-vividness ratings, as depicted in Figure 1. Let us now consider why these within-subject regression lines are negative in slope during self-conscious source monitoring, but positive when source-monitoring and its self-conscious aspect are either attenuated or inoperative.

Research on Self-Conscious Source Monitoring and Imaged Sensations of Varying Vividness

The empirically untested belief that hallucinations are simply mental images of perceptual vividness was commonly held by late 19th- and early 20th-century psychologists like Harald Høffding (1896):

> There is, indeed, as a rule a difference in the degree of strength [or vividness] of a memory–image and a percept; but this difference may be very small, and may even quite disappear. . . . No grounds are present for arranging the content of consciousness in two different spheres, in the world of possibility and imagination on one hand, and the world of reality and perception on the other. On the contrary, this contrast is discovered only through experiences in great measure bitter. We must often run our head against reality, before it becomes clear to us where its limits lie. (pp. 130–131)

In Figure 1's idealized depiction of within-subject source-monitoring results, Höffding and most early psychologists would have predicted (incorrectly) that a typical subject would take longer to discriminate perception-induced sensations from similar imagination-induced sensations of perceptual vividness, less time to discriminate perceptually generated sensations from imaginally generated sensations of lesser

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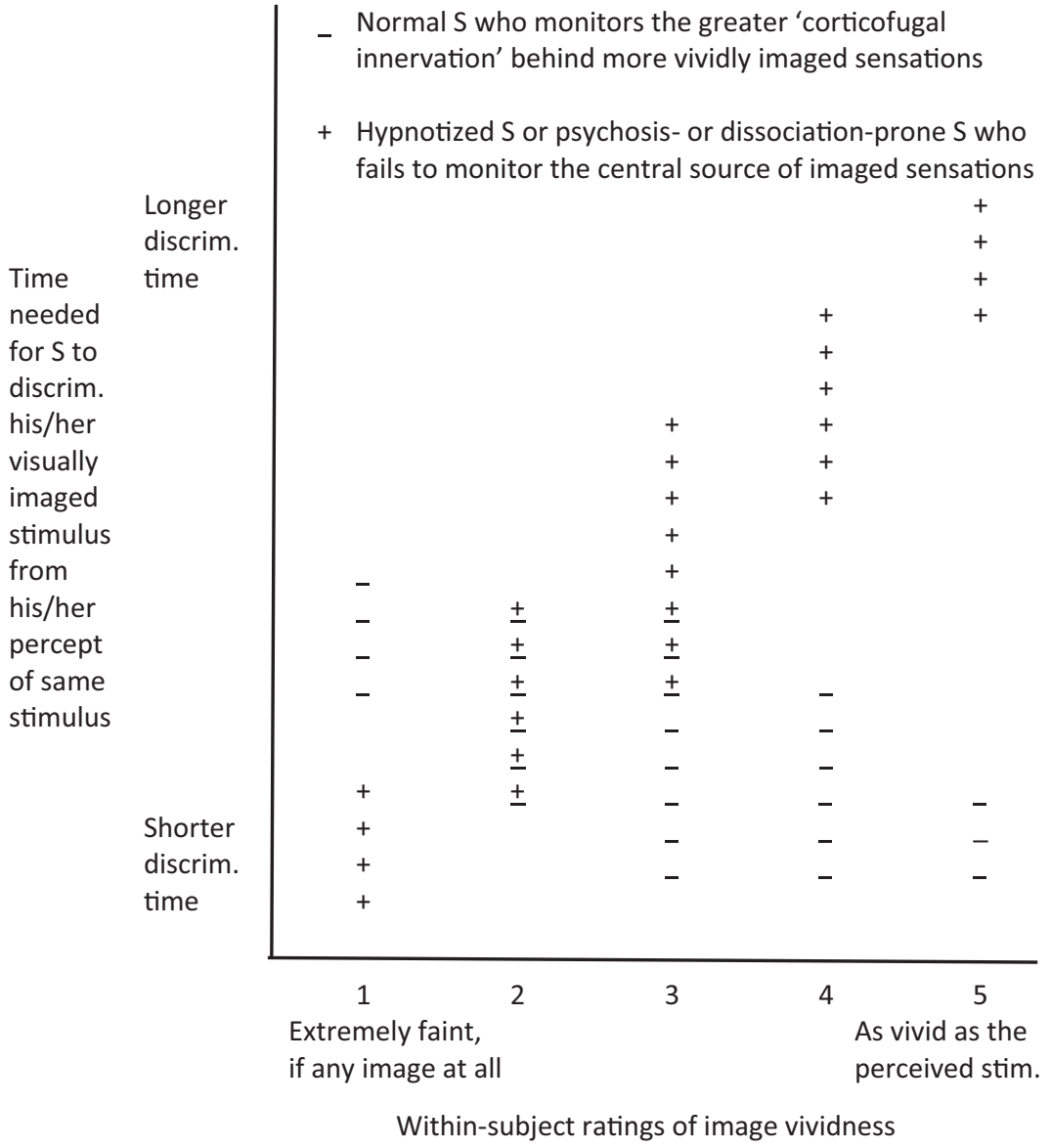


Figure 1. Two idealized 28-trial scattergrams: A normal subject's negative slope (faster image–percept discrimination times for more vivid images with more easily monitored "corticofugal innervation") and a hypnotized, dissociated, or psychotic subject's positive slope (slower image–percept discrimination times for more vivid images when self-conscious source monitoring is inoperative).

vividness, and would thus exhibit a positive within-subject slope in Figure 1. In contrast, Kunzendorf's source-monitoring theory predicts that, because vividly imagined sensations require a greater amount of central innervation or central neural effort than faintly imagined sensations require, the source-monitoring system in self-conscious subjects should more quickly detect the central source of vividly imagined sensations—and should yield a negative slope in Figure 1. As predicted by source-monitoring theory, three different studies em-

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ploying Kunzendorf's source-monitoring paradigm have yielded significantly negative within-subject slopes—that is, significantly faster percept–image discrimination times for images of greater vividness, within-subject—in self-conscious subjects (Kunzendorf, 1980; Kunzendorf, 1986; Kunzendorf, Moran, & Gray, 1995). Another study has yielded negative, albeit not quite significant, within-subject slopes in self-conscious subjects (Kunzendorf & Karpen, 1997).

Research on Self-Conscious Source Monitoring and Hallucinated Sensations

Hallucinated sensations in hypnotic images. Based on the idealized slopes in Figure 1, source-monitoring theory predicts that self-consciously monitored images manifesting a negative slope should become hallucinatory images manifesting a positive slope during hypnosis—to the extent that hypnosis attenuates source monitoring, as Ernest Hilgard (1977, p. 231) and Kunzendorf (2010) claimed. Consistent with this prediction, Kunzendorf's (1986) study of source-monitoring before hypnosis and during hypnosis found that the average within-subject correlation between prehypnotic image-vividness ratings and prehypnotic image–percept discrimination times was −0.15 for all 30 subjects in the study, −0.20 for the nine most hypnotizable subjects, and −0.14 for the 11 least hypnotizable subjects. When within-subject source-monitoring correlations were subsequently remeasured in the same individually tested subjects following the induction of hypnosis, the average within-subject correlation between hypnotic image-vividness ratings and hypnotic image–percept discrimination times was 0.02 for all 30 subjects, 0.33 for the nine most hypnotizable subjects, and −0.06 for the 11 least hypnotizable subjects. Altogether, the 30 subjects' within-subject correlations between prehypnotic vividness ratings and prehypnotic discrimination times were not statistically associated with the subjects' subsequent hypnotizability, $r = .02$; whereas the 30 subjects' within-subject correlations between hypnotic vividness ratings and hypnotic discrimination times were significantly associated with the subject's hypnotizability scores, $r = .43$. Or in terms of Figure 1, negative slopes indicative of self-conscious source-monitoring became, during deeper hypnosis, positive slopes indicative of the deactivation of neural source-monitoring and the attenuation of self-consciousness that one is imaging sensations. According to Kunzendorf's monitoring theory, such hypnotic deactivation of source monitoring should attenuate both the veridical self-awareness that one is imaging sensations and the generic illusion that one is "having" sensations. In this regard, Hilgard (1977) noted that "in deep hypnosis . . . there is a feeling of selflessness, and . . . reality testing does not go on" (p. 227).

Hallucinated sensations in dream images. In principle, the attenuation of self-conscious source monitoring, as measured by a positive slope in Figure 1's paradigmatic plot of image–percept discrimination times over image vividness ratings, should apply to all hallucinated images—to the hallucinated images of dreaming as well as the hallucinated images of hypnosis. And indeed, a theoretical linkage between dreamt hallucinations and hypnotic hallucinations is suggested by Kunzendorf, Brown, and McGee's (1983) finding that tiredness from too little sleep is positively associated with responsiveness to hallucinatory suggestions and other hypnotic suggestions. But in practice, Kunzendorf's paradigm for testing source monitoring cannot be administered to sleeping people with nonlucid hallucinatory dreams or with lucid pseudohallucinatory dreams. Faced with this practical limitation, Kunzendorf et al.'s (2007) research on dreaming used a questionnaire to show that lucidly dreamed sensations are not self-consciously discriminated from perceptual sensations—but are simply inferred to be unreal or imaginary even if they are perceived, and sometimes are also inferred to be controlled by an illusory "self as agent."

The "self as subject" in lucid dreams. Kunzendorf et al. (2007) found evidence for the attenuated monitoring of source and the attenuated illusion of "self as subject" during lucid dreaming. Specifically, almost 70% of the 93 lucid dreamers studied by Kunzendorf et al. confirmed that lucid dreams are not actually discriminable from percepts, by affirming that "[d]uring a lucid dream, [they] have heard a real noise (an alarm clock, e.g.) and have believed the noise to be part of [their] lucid dream . . . without any immediate self-awareness [of] actually perceiving the noise."

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The "self as object" in lucid dreams. The 93 subjects studied by Kunzendorf et al. (2007) indicated that over 99% of their lucid dreams were inferred to be dreams, based on the "self as object" and its relationship to other objects in such dreams. Broken down by specific inferences, 22% of the 93 subjects' lucid dreams were inferred to be dreams, because of "temporarily wak[ing] up during a dream," 10% because of "repeating an experience from a previous dream or from a waking event," 9% because of dreamed "movements (flying, running in slow motion, e.g.) [that] could not happen in reality," 8% because of "experience [that] was too nightmarish to be real," 6% because of "secret wishes [that] were realized in the dream," 6% because of behavior-related "consequences [that] were not the same as in waking life," 5% because of a "thought process or memory process [that] wasn't the same as in waking life," 5% because of "things in [their] vision [that] did not look the way they look in waking life," 4% because of a dreamed geophysical event "which could not possibly happen in real life (e.g., earthquake damage magically undone)," 3% because of "one or more things in the dream [that] morphed into something else," 3% because of "vision [that] was more (or less) colorful or more (or less) clear than normal," 3% because of "standing [in the dream] but [knowing they were] really lying down," 3% because of feeling "numbness in [their] arm" and being unable to "reconcile it with [their] dream," 2% because of having "so little emotion in a situation that would have evoked emotion if it were real," 2% because of "secret fears [that] were realized in the dream," 2% because of a "smell [that] was different from the way it is in waking life," 2% because of being "an animal or non-human creature in the dream," 1% because of "hearing [that] was more acute or more muffled than normal," 1% because of "things [that] sounded different from the way they sound in waking life," 1% because of "the environment in [their] dream" feeling "out of sync" with their "body temperature," and 1% because of their "gender in the dream . . . not correspond[ing] to [their] actual gender."

The "self as agent" in lucid dreams. With regard to inferences of an illusory "self as agent," 34% of the 93 lucid dreamers indicated that they "know [they] have been able to control what was happening in [a lucid] dream." Georgieff and Jeannerod (1998) suggested that this illusory attribution of a "self in control" or a "self as agent" may arise in lucid dreamers when their private desires and their dreamed actions are concordant. Consistent with Georgieff and Jeannerod's suggestion, Kunzendorf et al. (2007) found that, in 26% of the 93 subjects' lucid dreams, "other people simply do whatever [the lucid dreamer] want[s] them to do." Presumably in other lucid dreams with a sense of "self as agent," objects besides people do whatever the lucid dreamer desires or wants them to do.

Hallucinated sensations in psychotic images. In a commentary translated and quoted by Mishara, Lysaker, and Schwartz (2014, p. 8), Mayer-Gross (1932) noted that "the schizophrenic patient may be characterized as an 'awake sleeper.'" By implication, the abnormally hallucinated sensations of psychotic patients and psychosis-prone individuals, like the normally hallucinated sensations of dreamers and individuals in a sleep-like hypnotic trance, should be unaccompanied by the specific self-awareness that one is imaging sensations and the generic illusion that one is "having" sensations. To test this implication, Kunzendorf et al. (1995) examined psychosis-prone students' average within-subject slope—for image–percept discrimination times over vividness ratings, as in Figure 1—and compared it to the average within-subject slope of students with normal scores on psychoticism scales. They gave 149 college students both Kunzendorf's source-monitoring paradigm and Overall and Gomez-Mont's (1974) Minnesota Multiphasic Personality Inventory (MMPI)-168, then averaged the discrimination-time-over-vividness slopes of psychosis-prone students scoring very high on one of the MMPI-168's three psychoticism scales: Paranoia, Schizophrenia, and Hypomania. On average, the 12 students with a Paranoia *T* score above 80 exhibited a significantly positive slope of 27.4; the 48 students with a normal Paranoia *T* score below 50 exhibited a significantly negative slope of −9.8; and all 149 students exhibited a significant linear trend with slopes increasing as Paranoia *T* scores increased. In like manner, the 20 students with a Schizophrenia *T* score above 80 exhibited a positive but not significant slope of 11.1, the 33 students with a normal Schizophrenia *T*

score below 50 exhibited a negative but not significant slope of −5.0, and all 149 students exhibited a significant linear trend with slopes increasing as Schizophrenia *T* scores increased. And in similar manner, the 17 students with a Hypomania *T* score above 70 (none was above 80) exhibited a positive but not significant slope of 11.2, the 36 students with a normal Hypomania *T* score below 50 exhibited a significantly negative slope of −13.2, and all 149 students exhibited a significant linear trend with slopes increasing as Hypomania *T* scores increased. On the whole, the normal students with normal *T* scores on an MMPI-168 psychoticism scale exhibited negative within-subject slopes, as predicted in Figure 1, the remaining students' slopes increased as their psychoticism *T* scores increased, and the students with psychoticism *T* scores in the highest category exhibited positive slopes which, according to Figure 1, reflect the failure of these psychosis-prone students to engage in self-conscious source monitoring.

Thus, during the attenuation of self-conscious source-monitoring in psychosis-prone subjects, perceptual sensations take longer to discriminate from similar imaginal sensations of perceptual vividness than from imaginal sensations of lesser vividness. And during this attenuation, not only can vivid visual images become unmonitored visual hallucinations, but faint visual images also can become visual hallucinations: During the author's clinical externship, for example, he treated a schizoaffective patient who faintly imaged that her deceased brother was handing her a noose, who inferred that this unmonitored image was a percept of her brother's ghost urging her to kill herself, and who thereby avoided the devastating nonpsychotic inference that her own suicidal ideation was faintly depicted in a self-generated image.

According to the monitoring theory of self-consciousness, such psychosis-attenuated source monitoring should extinguish not only the specific self-awareness that one is imaging sensations, but also the generic illusion that one is "having" sensations. In the latter regard, Sass and Parnas (2003) have reviewed the phenomenological evidence that patients on the schizophrenia spectrum experience "a diminishment of . . . the implicit sense of existing as a vital and self-possessed subject of awareness" (p. 428).

Research on Self-Conscious Source Monitoring and Dissociated Sensations

According to Kunzendorf (2000, 2015) and Lynn et al. (2019), source monitoring or "meta-consciousness" is attenuated by dissociative states as well as psychotic states. Attenuated source-monitoring in psychosis, as just discussed, (a) creates a reduced self-awareness that threatening images are imaginary sensations, (b) allows for a psychotic inference—a defensive, incorrect inference—that those self-generated images are perceptual sensations generated outside the self, and (c) thus enables a threatening image to become a hallucination. Attenuated source-monitoring in dissociation, by comparison, (a) creates a reduced self-awareness that threatening percepts are perceptual sensations, (b) allows for a dissociative inference—a defensive, incorrect inference—that those percepts are just figments of one's imagination, and (c) thus enables a threatening percept not to be encoded or remembered as real. Not surprisingly, then, both dissociating and hallucinating can occur in patients with dissociative disorders (Kluft, 1987; Renard et al., 2017; Ross, Miller, Reagor, Bjornson, Fraser, & Anderson, 1990; Ross, Norton, & Wozney, 1989; Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011) and in patients with psychotic disorders (Kilcommons & Morrison, 2005; Perona-Garcelán et al., 2012; Renard et al., 2017). The resulting issue for clinicians is that, when patients' sensations are dissociated from self-consciousness of their source, it can be very difficult to determine whether patient-reported traumas reflect unmonitored perceptual sensations or unmonitored imaginal sensations. Before returning to this issue as it applies to recovered memories versus false memories, let us consider evidence pertaining to the attenuation of real-time source monitoring in dissociation-prone individuals.

Dissociation, percept-monitoring, and self-consciousness. In Kunzendorf and Karpen's (1997) study of dissociative experiences and source-monitoring deficits, computerized versions of Bernstein and Putnam's (1986) Dissociative Experiences Scale (DES) and Kunzendorf's source-monitoring paradigm were administered to 141 college students. For the 66 students who had above-median scores on the Dissociative Amnesia factor of the DES,

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the within-subject slope for discrimination times over image-vividness ratings was significantly positive (M_{slope} = 0.21) and thus, as Figure 1 illustrates, was indicative of attenuated source monitoring. And according to monitoring theory, this attenuation of the source-monitoring mechanism in dissociation-prone persons should, from a subjective perspective, attenuate not only the specific self-awareness that one is perceiving sensations, but also the generic illusion that one is "having" sensations. In the latter regard, David Spiegel (1990) has noted that dissociative experiences "involve active processing with the suspension of self-awareness [where this] self is not an ordinary object of consciousness but rather a subject of consciousness" (p. 134).

Dissociative amnesia and repressive amnesia. As noted above, source-monitoring theory allows for source amnesia concerning any trauma that is unmonitored at the time of its occurrence. In contrast, psychodynamic theories positing that any trauma—remembered or fantasized—must be continuously repressed into "the unconscious" allow only for total amnesia concerning such trauma. The source-amnesia account and the repressive-amnesia account were compared in Kunzendorf and Moran's (1994) experimental adaptation of Saul Rosenzweig's (1941) paradigm for inducing repressive amnesia. In this experiment, three groups of subjects worked for 2.5 min on each of 12 successively presented anagrams—half of which were solvable, half unsolvable, and half of which were accompanied by a perceived clue, half by an imagined clue. For the two groups in which failure to solve any given anagram was made stressful, the perceived clues from unsolved anagrams were most likely to be indiscriminable from imagined clues, consistent with the source-amnesia account.

Dissociation, repression, and "self as subject." It is noteworthy that the psychodynamic and Freudian theories of repressive amnesia are not only incompatible with these source-amnesia findings of monitoring theory, but also incompatible with the anti-Cartesian foundations of monitoring theory. Indeed, Sigmund Freud's (1916/1922) theory of repression explicitly called for two "subjects of consciousness"—the "gatekeeper" inside "the unconscious," and the "eye of consciousness" outside "the unconscious":

> The unconscious system may therefore be compared to a large anteroom, in which the various mental excitations are crowding upon one another, like individual beings. Adjoining this is a second, smaller apartment, a sort of reception-room, in which consciousness resides. But on the threshold between the two there stands a personage with the office of door-keeper, who examines the various mental excitations, censors them, and denies them admittance to the reception-room when he disapproves of them. . . . The excitations in the unconscious, in the ante-chamber, are not visible to consciousness, which is of course in the other room, so to begin with they remain unconscious. When they have pressed forward to the threshold and have been turned back by the door-keeper, they are "*incapable of becoming conscious*"; we call them repressed. But even those excitations which are allowed over the threshold do not necessarily become conscious; they only become so if they succeed in attracting the eye of consciousness. . . . I should like to assure you that these crude hypotheses, the two chambers, the door-keeper on the threshold between the two, and consciousness as a spectator at the end of the second room, must indicate an extensive approximation to the actual reality. (pp. 305–306)

Unlike Freudian theory, source-monitoring theory does not posit even a single Cartesian subject, much less two.

Dissociative amnesia and "false memory." In one of the seminal studies of "false memory," Johnson, Raye, Wang, and Taylor (1979) studied the memorial confusion of perceived and imaged stimuli and purportedly found greater confusion in better imagers. However, Johnson and her coauthors defined better imagers as subjects with higher recall for visual detail (not as subjects with more vivid imagery), and subsequent research by Dowens and Calvo (2003) and Zuroff, Colussy, and Wielgus (1983) has shown that higher numbers of correctly recalled items are associated with higher numbers of recall intrusions or falsely recalled items, on account of individual differences in recall criteria or response bias. In repeating Johnson's study but using Marks's (1973) Vividness of Visual Imagery Questionnaire to define "better imagers," Kunzendorf (1993) found less source-memory confusion in "better imagers" with more vivid imagery—consistent with the memorial implications of Figure 1. Furthermore, in a study of image vividness and "false memory" controlling both for response bias and for dissociation (as measured by the DES), Belliveau and Kunzendorf (2015) found that forced-choice false recognition controlling for response criteria was statistically associated with

higher Dissociative Amnesia scores controlling for image vividness ratings and was not associated with greater image vividness controlling for Dissociative Amnesia scores. Thus, even though Kunzendorf's source-monitoring theory focuses on image–percept discrimination and Johnson's source-monitoring theory focuses on image-memory discrimination, Kunzendorf's theory accounts for the empirical relationship between image-vividness ratings and image-memory discriminations in research controlling for response biases and dissociative experiences.

Recovering amnestic engrams and confabulating false memories. Source-monitoring theory predicts that amnesias for unmonitored experiences can be breached by asking amnesic persons to (a) describe any unbidden images of experiences that could be imaginary or real, or (b) imagine possible memories of experiences that could be imaginary or real.

Kunzendorf (1990) conducted two experimental studies to determine whether posthypnotic amnesia can be breached with the latter of these two approaches. Previous studies found minimal breaching of posthypnotic amnesia when highly hypnotizable subjects were exhorted to respond honestly, with or without a lie detector, or were exhorted to try harder and maximize recall (Coe & Yashinski, 1985; Kihlstrom, Evans, Orne, & Orne, 1980). Kunzendorf's second study found that posthypnotic amnesia was readily breached when highly hypnotizable subjects were given the following posthypnotic instruction:

> Sometimes it's hard to remember hypnotic events, because you are not sure whether you are just imagining events or whether you are actually remembering them. In a moment, I want you to try to recall some more hypnotic events, as many of the remaining events as you can. But this time, use your imagination to conjure up the hypnotic events. Do not worry if you feel like you are not using your memory. Just *trust your imagination* and, for the next two minutes, write down as many of the remaining events as you can.

This posthypnotic instruction not only produced significantly more posthypnotic recovery than the instructions in two control conditions, but also produced no more intrusions than the control conditions. Notably, Kunzendorf's first study found that posthypnotic source amnesia did not need to be suggested, but occurred spontaneously, and that the cued release from suggested posthypnotic amnesia simply signaled source-amnesic subjects to switch their recall criterion, from a criterion rejecting "seemingly imaginary" or "sourceless" engrams to a criterion accepting "sourceless but familiar" memories. And as noted throughout this article, the attenuation of source monitoring by psychosis, hypnosis, and dissociation turns imaginally experienced sensations into hallucinations or confabulations, in addition to turning perceptually experienced sensations into unmonitored engrams. So, outside the experimental environment, it is impossible to be certain whether dissociation-prone individuals are recovering sourceless engrams or confabulating false memories. For this reason, Thayer and Lynn's (2006) cautions regarding any attempt to recover memory during psychotherapy are well taken.

"Self as subject," "self as object," and multiple personalities. According to Morton Prince (1921, 1925), the founding editor of the *Journal of Abnormal Psychology*, a patient with alternating personalities does not alternate between subjects of consciousness; rather, he or she shifts from the illusory experience of "self as subject" to the subconscious experience of no self-conscious subject, while shifting from his or her dominant personality or dominant self-conception to a threatening personality or threatening "self as object." In this context, the current argument—that "the subconscious experience of no self-conscious subject" is attributable to attenuated source-monitoring and is associated with source amnesia—leaves open the possibility that nonthreatening multiple personalities without personality-specific amnesias might be present in the normal population. To test this possibility, Kunzendorf, Crosson, Zalaket, White, and Enik (1999) asked college students to rate 31 normal situations (attending a religious service, wearing a Halloween costume, etc.) on one scale measuring the extent to which their sense of self is different in a particular situation, a second scale measuring the extent to which their behavior is controlled by a different part of themselves in the particular situation, and a third scale measuring the extent to which significant life events seem impossible to recall or seem not real in the particular situation. They found that the DES's two pathological factor scores—its positively skewed Dissociative Amnesia score and its Derealization/Depersonalization score—were statistically

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associated with the positively skewed number of situations in which significant events seemed either impossible to recall or not real. However, they also found that the DES's nonpathological factor score—its normally distributed Absorption/Imagination score—was statistically associated with both the normally distributed number of situations in which subjects reportedly had a different sense of self and the normally distributed number of situations in which their behavior was reportedly controlled by a different part of themselves. These findings suggest that experiencing a different "self as object" or a different personality in a specific situation is normal, but experiencing situation- and personality-specific amnesias is not normal.

Research on Self-Conscious Source Monitoring and Subconscious Percepts

Let us now return to the empirical phenomenon which served, historically, as the catalyst for interpreting "self as subject" in illusory terms: the phenomenon of subliminally or subconsciously perceived sensations. As observed in the introduction to this article, Leibniz's introspective analysis of "petites perceptions" without any self-conscious apperception and Fechner's psychophysical research on "subliminal" sensations below the apperceptive threshold led to psychophysical parallelism: the anti-Cartesian position that particular sensations parallel particular neural events and may or may not be accompanied by the illusion of a subject "having" those sensations. And consistent with the current monitoring-theory interpretation of this illusion, early twentieth-century research by Perky (1910) showed that "subliminal" sensations unaccompanied by self-consciousness that one is "perceiving" them are not readily discriminated from faint mental images. But in the latter half of the 20th century, Dixon's (1981) book *Preconscious Processing* theoretically reinterpreted subception research in terms of the computer metaphor for mind—a metaphor that assumes that sensory information can only travel through the nervous system nonconsciously just as it travels through a computer and, in humans, either can finish up its nonconscious journey as a sensationless percept or can proceed to a subjectively compelling but objectively unnecessary endpoint where epiphenomenal sensations are appended to the preconscious percept.

Subconsciously perceived sensations versus nonconscious percepts. Kunzendorf (1984) and Kunzendorf and Butler (1992) conducted comparative tests of Dixon's latter argument for sensationless preconscious perception and Fechner's historic argument for conscious sensation without self-conscious apperception. Kunzendorf (1984) found that subjects were memorially unable to distinguish between visual sensations previously imagined and visual sensations previously perceived in the periphery of the visual field, and concluded that the unattended sensations in the periphery were subconsciously perceived sensations—conscious sensations unaccompanied by any self-conscious apperception or any self-conscious monitoring of their perceptual (vs. imaginal) source. Kunzendorf and Butler (1992) experimentally tested Julesz's (1971) assertion that, during the "cyclopean perception" of random-dot stereograms, monocular input to the stereogram is processed nonconsciously. In their experimental stereograms, the input to the left eye was a randomly generated matrix of black and yellow dots. The input to the right eye usually was identical except for a binocularly displaced set of black and yellow dots that stereoscopically became a letter of the alphabet—but sporadically was identical except for the binocularly displaced dots plus a purely monocular set of black and green dots that formed another letter of the alphabet. Different alphabetic letters that had previously been imagined were memorially distinguishable from stereoscopically displaced letters, but not from the purely monocular letters. Kunzendorf and Butler concluded that the monocular stimuli composing random-dot stereograms were not nonconsciously processed, as Julesz asserted, but were subconsciously perceived as conscious sensations unaccompanied by any self-conscious monitoring of their perceptual (vs. imaginal) source.

Return of the subliminal. In a classroom demonstration of subliminal perception, the author briefly flashed the subliminal word "stagecoach" on a screen, asked students to yell out the word's identity, and, when they said that they couldn't, asked them to yell out their guesses as to the word's identity. In response to the latter request, several students instantly yelled "horses." The source-monitoring inter-

pretation of this demonstration is that the subliminal word "stagecoach" was initially experienced too briefly to be monitored as perceptual in source, and was consequently not recallable as the perceived word, but was strongly associated with the word "horses"—which was guessed in lieu of weakly associated words like "robbery" and in lieu of the unmonitored (and uncommon) word "stagecoach." Following up on this, Kunzendorf and McGlinchey-Berroth (1997) presented subjects 40 seven-trial blocks, wherein words were alternately imagined and apperceived across Trials 1–6, and were either apperceived or subliminally perceived on Trial 7. In testing at the end of each block, Trial 7's subliminal word or Trial 7's apperceived word or a an earlier trial's apperceived word or an earlier trial's imagined word was paired with a new distractor word, and on half the tests, subjects decided which of the paired words was "visually perceive[d] during the last seven trials," and on the other half, they decided which of the paired words was "experience[d]—through imagination or perception—during the last seven trials." Kunzendorf and McGlinchey found that the forced-choice recognition of Trial 7 subliminal words was significantly greater than chance when subjects had to recognize whether the subliminal words were experienced (imagined or perceived), but not when they had to recognize whether the subliminal words were perceived. Taken together, the experimental demonstrations described in this paragraph suggest that subconsciously perceived sensations are conscious like mentally imaged sensations, but are accompanied neither by the monitoring-based experience of "perceiving" sensations nor by the resulting illusory experience of "having" sensations.

"Self as Subject" Versus "Self as Object"

This essay on self-awareness summarizes theory and research on the experience of "self as subject" and its illusory but functional nature, whereas Kihlstrom and Klein's (1997) treatise on self-awareness summarized theory and research on the experience of "self as object" and its conceptual representation, narrative representation, visual/sensory representation, or associative representation. Kunzendorf, McLaughlin-Beltz, and Tymowicz (1991) conducted a single study designed to demonstrate experimentally James's important distinction between "self as subject" and "self as object." In a variation of Gordon Gallup's (1979) paradigm for testing self-recognition in mirrors, the study's subjects put their hands through holes on opposite sides of a box on their lap; they could not directly see either their hands or a white line inside the box, but could indirectly see all three in a televised mirror image. When instructed to touch the line, autistic subjects tended to reach toward the televised line, whereas deeply hypnotized subjects, hypnotic simulators, and control subjects tended to reach toward the actual line occluded inside the box. This first result suggests that autistic subjects had a different visuospatial conceptualization of "self as object" in relation to the line as object. Subsequently, while moving their occluded hands slowly together until their fingertips were touching inside the box, and while simultaneously watching a televised prerecording of their fingertips slowly moving closer and closer together without ever touching, the deeply hypnotized subjects tended to deny that their fingertips were touching, whereas the hypnotic simulators, autistic subjects, and control subjects confirmed that their fingertips were touching. This second result suggests that hypnotized subjects' unmonitored visual sensations of their fingertips not touching were overriding their unmonitored tactile sensations of their fingertips touching—due to the hypnotic attenuation of the source-monitoring process and the parallel attenuation of the tacit self-awareness of perceiving the visual and tactile sensations.

Conclusions

Collectively, the empirical studies summarized in this article lend support to the author's thesis that the illusory self-awareness of "having" sensations (a) parallels the neural source-monitoring of sensations and (b) accompanies sensations only if the sensations are not too faint or too brief or too near the fringe of the visual field, and only if the neural source-monitoring is not rendered inoperative by a sleep state or hypnotic state or psychotic state or dissociative state. And finally, this monitoring-based conclusion carries with it two important psycholog-

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ical implications, one regarding the past and one regarding the future. In terms of the past, the conclusion that our experience of a "subject of consciousness" having sensations is an illusion derived from source monitoring implies that no Cartesian "self as subject" is conscious of sensations—as the early work of Leibniz, Fechner, James, Prince, and other anti-Cartesian founders of psychology also implied. And in terms of the future, the conclusion that our experience of "self as subject" is attributable to a psychological illusion, not an immortal subject of consciousness, carries implications for each person's ultimate hope, fate, and moral clarity—as Kunzendorf (2016) has empirically confirmed and as McDougall (1911) has most eloquently affirmed,

> . . . the conceptions of the nature of, and of the relations between, mind and body are those which in the long run affect most profoundly, and are of the first importance for, [the] guidance of conduct; for they must always exert a determining influence upon man's view of his place in the world, upon his prospects, his hopes, and his deepest purposes, and hence upon his conduct. (p. 87)

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