The Motivational Unconscious

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Running Head: Unconscious Motives

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Abstract

Motives may be said to be unconscious in a variety of ways. They may be automatically and unconsciously elicited by consciously perceptible situational cues; they may be instigated by cues that are themselves excluded from conscious awareness, as expressions of implicit perception or memory; or the person may be consciously unaware of his or her actual motivational state. The paper reviews the evidence pertaining to all three aspects of unconscious motivation, with emphasis on conceptual and methodological questions that arise in the study of motives which are not accessible to phenomenal awareness or voluntary control, but nonetheless influence the individual's experience, thought, and action.

Keywords

motivation; goals; automaticity; consciousness; dual-process theories; masked priming; implicit motives.

Biographical Sketch

John F. Kihlstrom is Professor Emeritus in the Department of Psychology, University of California, Berkeley. At the time of his retirement was also the Richard and Rhoda Goldman Distinguished Professor in the Division of Undergraduate and Interdisciplinary Studies, at the A cognitive social psychologist with clinical training and interests, he graduated from Colgate University in 1970 and took his PhD, with a concentration in Personality and Experimental Psychopathology, from the University of Pennsylvania in 1975; his graduate advisor was Martin Orne. Before coming to Berkeley, Kihlstrom completed a clinical internship at Temple University Health Sciences Center and held faculty positions at Harvard, Wisconsin, Arizona, and Yale. His 1987 *Science* paper on “The Cognitive Unconscious” is generally held to be a milestone in the revival of scientific interest in unconscious processing. Along with an essay on “The Emotional Unconscious”, published in 2000, this paper completes a trilogy of articles surveying unconscious mental life.

The Motivational Unconscious

Motives may be defined as internal states which drive, direct, and select behavior – in particular, behavior that approaches rewards and incentives, and avoids threats and punishments (D.C. McClelland, 1985) (for more complete coverage of motivation, see) (Ryan, 2012; Shah & Gardner, 2013). Over the years, a variety of schemes have been proffered for the classification of motives: innate vs. acquired; primary vs. secondary; physiological vs. social; homeostatic vs. non-homeostatic; intrinsic vs. extrinsic; acutely vs. chronically accessible; trait vs. state; outcome-focused vs. process-focused; needs vs. wants vs. wishes. Freud (Freud, 1920/1955) famously distinguished between the life and death instincts. Murray (1938) listed some 13 "viscerogenic" needs, such as hunger, thirst, and sex, and 28 "psychogenic" needs, such as the three great social motives of achievement (D.C. McClelland, Atkinson, Clark, & Lowell, 1953), power (Winter, 1973), and affiliation or intimacy (McAdams, 1989). Maslow (Maslow, 1943) created an entire hierarchy of needs, ranging from physiological needs at the bottom to self-actualization at the top. Kenrick and his colleagues have proposed an updated pyramid of needs, based on evolutionary psychology, in which self-actualization plays no role (Kenrick, Greiskevicius, Neuberg, & Schaller, 2010).

Usually we think of motives as conscious mental states, and motivated behavior as consciously directed toward some goal which will satisfy some desire. In fact, much of scientific and folk psychology, including the theory of mind and other aspects of social cognition, explains behavior in terms of conscious mental states of belief, feeling, and desire, which combine to produce an intention, which in turn is translated into behavior:

John believed it was going to rain, but he wanted to stay dry, so he took an umbrella to work. In Western jurisprudence, *actus rea* must be accompanied by *mens rea* – and the *mens rea* must be conscious.

Beginning in 1989, McClelland and his associates introduced yet a further distinction, between explicit and implicit motives (D.C. McClelland, Koestner, & Weinberger, 1989). Although personality assessment commonly relies on self-ratings and self-report questionnaires, McClelland -- like Murray before him -- doubted that these produced particularly valid assessments of motivation. People might be unwilling to report their true motives to an investigator; or, more critically, they might not be consciously aware of their true motives at all. In that case, their motives were "implicit", or unconscious, albeit reflected in behavior.

The label "implicit", meaning "unconscious", was certainly in the air. Although McClelland et al. did not cite either author, Reber (Reber, 1967, 1989) had already distinguished between explicit and implicit learning, and Schacter (Schacter, 1987) had drawn a similar distinction between implicit and explicit memory. These papers were hallmarks of the revival, within cognitive psychology and cognitive science, of an interest in unconscious cognition (Kihlstrom, 1984, 1987). Later, the explicit-implicit distinction was extended to perception (Kihlstrom, Barnhardt, & Tataryn, 1992), thinking (Dorfman, Shames, & Kihlstrom, 1996; Kihlstrom, Shames, & Dorfman, 1996), and emotion (Kihlstrom, Mulvaney, Tobias, & Tobis, 2000) (for fuller coverage, see) (Kihlstrom, 2012). So far as unconscious mental life is concerned, implicit motivation completes the Kantian "trilogy of mind" of knowledge, feeling, and desire (Hilgard, 1980).

Following Schacter's definition of implicit memory, we can define implicit motivation as *any effect on an individual's experience, thought, and action, which can be attributed to a motive, in the absence of, or independent of, conscious awareness of that motive*. We are not verging into Freudian territory here. In modern parlance, "unconscious motivation" is not about primitive sexual and aggressive impulses arising from the id, and defenses against them constructed by the ego in order to manage conflicts with the internalized standards of the superego. Rather, we are talking about ordinary needs and desires, of the sort represented by Murray's or McClelland's or Maslow's lists. The purpose of this paper is to outline some issues raised in the study of unconscious motivation (for alternative views, see) (Aarts & Custers, 2014; R. Custers & Aarts, 2010; Dijksterhuis & Aarts, 2010; Kehr, Thrash, & Wright, 2011; Schultheiss, 2008; Schultheiss & Brunstein, 2010).

The motivational unconscious actually encompasses three distinct areas: (1) motives which are activated automatically without conscious intent; (2) motives which are activated by cues of which the person is not consciously aware; and (3) motives which are themselves not accessible to conscious awareness. Space does not permit comprehensive coverage of this literature. In this paper, I focus on a few representative approaches to unconscious motivation, drawing on the established literature on unconscious perception and memory, to explore the problem of demonstrating that motives can operate outside of phenomenal awareness and conscious control. The conclusion I draw is that, while there is no principled reason why motives cannot operate unconsciously, the dissociation of unconscious (implicit) from conscious (explicit) motivation has not yet been firmly established.

Motivation and Automaticity

Conscious motives can be elicited automatically, without conscious intent, by the appearance in the environment of motive-relevant cues. This is the essential point of Bargh's "*auto-motive*" model of social behavior, which contradicts the traditional model by which we deliberately execute intentions according to conscious beliefs and desires (Bargh, 1990; Bargh & Barndollar, 1996; Huang & Bargh, 2013). Instead, Bargh and his colleagues argue that, to a great degree, goal-directed behavior is a product of automatic processes operating unconsciously, rather than a result of conscious deliberation. In the auto-motive model, goals and motives are automatically activated by the processing of relevant environmental events – especially if these goals and motives are habitual or "chronically activated". Once activated, they influence experience, thought, and action outside conscious awareness and conscious control.

Traditionally, automatic processes have been characterized by the four canonical features listed in Table 1 (for critical analyses, see) (Melnikoff & Bargh, 2018; Moors, 2013, 2016). Collectively, these features constitute a sort of prototype of an automatic process. None of them may be absolutely necessary to define a process as automatic; but the more of them that are present, the more confident we can be that a process has truly been performed automatically. The definition of automaticity is further complicated by the fact that these features are continuous rather than discrete. Thus, an automatic process may consume some attentional resources – reducing, but not entirely eliminating, interference with controlled processes. For these reasons, automaticity can vary in degree. In principle, however, automatic processes are unconscious in the

sense that, by virtue of their speed and limited consumption of attentional resources, their execution is not available to phenomenal awareness.

Table 1
Canonical Properties of Automatic Processes

Inevitable Evocation by the relevant cues in the stimulus environment, in an almost reflex-like fashion.
Incorrigible Completion: once activated, automatic processes cannot be checked, and run to completion in a ballistic fashion.
Efficient Execution, meaning that they consume little or nothing by way of attentional resources – or, put another way, their execution requires little or no cognitive effort.
Parallel Processing, meaning that they do not interfere with other ongoing processes.

In one illustrative series of "goal priming" (Chartrand & Bargh, 1996) experiments, Bargh and his colleagues asked subjects to unscramble sentences containing words related to achievement (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001) (, Experiment 1). The subjects who worked with the achievement-related words subsequently performed better on verbal puzzles than controls who processed neutral words. In another experiment in the same series, subjects unscrambled sentences relating to cooperation or competition. Later, those who processed the "cooperative" words behaved more cooperatively in a resource-management game than those who processed the "competitive" words (Experiment 2). A later experiment found that the goal-priming effect was strengthened after a delay of 5 minutes (Experiment 3). Apparently, merely reading motive-relevant words in the

puzzles automatically activated an internal representation of achievement, cooperative, or competitive goals, which then automatically activated corresponding behaviors.

Harris and her colleagues (Harris, Coburn, Rohrer, & Pashler, 2013) have reported a failure to replicate Bargh et al.'s (2001) Experiments 1 and 3, on achievement motivation (to my knowledge, there has been no attempt to replicate Experiment 2). However, a meta-analysis of conceptually 133 similar "goal priming" studies by Weingarten and colleagues (Weingarten et al., 2016) revealed a modest overall effect ($.33 < d < .35$) of priming on goal-related behavior. The study by Bargh et al. (2001) inspired the entire line of research reviewed by Weingarten, and as of December 31, 2018 has been cited more than 1000 times. For present purposes, however, these experiments serve only to illustrate the general approach to the study of the role of automatic, unconscious processing in motivation.

Automatic and Controlled Motivation

The idea that psychological processes can be activated and executed unconsciously, outside of conscious awareness and control, lies at the heart of a large class of "dual process" or "dual systems" theories which have become enormously popular in personality and social psychology (Chaiken & Trope, 1999; Sherman, Gawronski, & Trope, 2014) (; for an overview of dual-process theories in general, see) (Evans & Stanovich, 2013; Sloman, 1996; E. R. Smith & DeCoster, 2000); (for a critique of dual-process theories, see) (Keren & Schul, 2009). Although details differ from theory to theory, in general these theories postulate that experience, thought, and action can be influenced by processes that operate either automatically and unconsciously, or

under deliberate, conscious control. Some theorists argue that *both* automatic and conscious processes contribute to performance on every task, with the balance between them shifting depending on the task and other considerations . In either case, most theories assume that unconscious, automatic processes dominate consciously controlled ones – either because the former operate more rapidly than the latter, or because circumstances (e.g., lack of time or effort to do anything else) generally favor automatic processing.

While most dual-process theories have been developed in the context of attitudes and social cognition, a number of theories have been expressly concerned with issues pertaining to habits, goal-pursuit, and other aspects of motivation (e.g.,) (Aarts & Custers, 2014; Bargh & Barndollar, 1996; Bargh & Gollwitzer, 1994; Bargh et al., 2001; R. Custers, & Aarts, H., 2014; Ferguson & Cone, 2014; Ferguson, Hassin, & Bargh, 2008; Fishbach & Shen, 2014; Glaser & Knowles, 2008; Gollwitzer, 1999; Gollwitzer, Parks-Stamm, & Oettingen, 2009; Hassin, Bargh, & Zimerman, 2009; Kleiman & Hassin, 2011; Kruglanski et al., 2012; Kruglanski et al., 2015; Moskowitz, 2014; Wood, Labrecque, Lin, & Runger, 2014). Space does not permit a comprehensive survey of all these different approaches, so this review is confined to some general comments on automaticity in motivation.

Within the context of dual-process theory, one major issue has to do with the similarities and differences between motives which are activated in a consciously controlled fashion, and those which have been activated automatically and unconsciously. For example, Gollwitzer and his colleagues have suggested that unconscious motives are processed in a “bottom-up”, data-driven, reflex-like manner, so

that conflicts between goals are resolved sequentially, one by one, rather than in a deliberately integrated fashion, determined by the priorities associated with each goal (Gollwitzer, 1999; Gollwitzer et al., 2009). Even when goals are pursued automatically, they suggest that there are circumstances in which individuals can shift from automatic, unconscious to deliberate, conscious motivation: when obstacles are encountered, for example; or when the automatic behavior in question violates social norms.

Gollwitzer et al (Gollwitzer et al., 2009) have also suggested that, because automatic processes do not consume attentional resources, unconsciously activated motives are less subject to ego-depletion, or a loss of “will-power” (Baumeister, Bratslavsky, Muraven, & Tice, 1998), compared to motives that are consciously activated. The hypothesis makes sense, given the *efficient execution* property ascribed to automatic processing. Unfortunately, the phenomenon of ego-depletion itself has recently come under critical scrutiny (Carter, Kofler, Forster, & McCullough, 2015; Hagger, Wood, Stiff, & Chatzisarantis, 2010), and a definitive test of their hypothesis awaits resolution of that debate.

While conceding that automatic and controlled processes have distinct characteristic features, Ferguson and her colleagues (Ferguson & Cone, 2014; Ferguson et al., 2008) have argued that unconsciously activated motives have many properties in common with consciously activated ones. These include persistence in overcoming obstacles, stability over time, flexibility, and accessibility of goal-relevant knowledge. This is in line with the *similarity principle* proposed by Huang and Bargh (Huang & Bargh, 2013): regardless of whether they are activated consciously or unconsciously, goals have the same outcomes; automatically activated goals make use

of the same underlying neural circuits and information-processing mechanisms as consciously controlled ones. This is because conscious motivational mechanisms evolved out of earlier ones that operated unconsciously. Goal pursuit can occur mindfully or mindlessly, and automatic and controlled goal pursuit may differ in some respects, but their functions and consequences are very much the same. Whether consciously and deliberately instigated or automatically and unconsciously evoked, goals operate autonomously, pursuing their own agendas regardless of the interests of the individual. Some proponents of automaticity go so far as to assert that conscious motivational processes play little if any role in behavior at all (e.g.,) (Bargh, 2007; Wegner, 2002).

Much the same argument has been made by Aarts and his colleagues (Aarts & Custers, 2014; R. Custers & Aarts, 2010; Dijksterhuis & Aarts, 2010). They reject, or at least question, the common assumption that the individual's behavior is accompanied by conscious awareness of his or her goals, and the conscious intent to pursue them. Rather, they argue that goal-pursuit occurs in the absence of either conscious intent or conscious awareness, triggered by environmental stimuli, and mediated by motivational structures and processes that, themselves, operate unconsciously and automatically. In making this argument, Aarts et al. extend the principle of ideomotor action (Arnold, 1946; James, 1890/1980; Prinz, 1987; Shin, Proctor, & Capaldi, 2010), in which the idea of an action leads automatically to the action itself. In this application, the "idea" is the cognitive representation of a goal, which can be automatically and unconsciously activated, and the "action" can include not just simple motor responses like lifting a finger, but also complex interpersonal behaviors.

Dual-process models typically suggest that, in the ordinary course of events, an automatically evoked process can only be counteracted after it has been executed – after the damage has been done, as it were; this is the meaning of "incorrigible completion". So, for example, a competitive motive might be automatically activated by a situational cue; but only after people become consciously aware of their competitive goals (and behavior) can they consciously decide to behave in a cooperative manner instead. But there are other possibilities. If cognitive, emotional, and motivational processes are typically automatized through extensive practice (J. R. Anderson, 1982; Ericsson, Krampe, & Tesch-Römer, 1993), then a countervailing controlled process can also become automatized with practice. To continue the example, cooperation could become a stronger habit than competition.

Along these lines, Glaser and his colleagues have proposed a model of *implicit motivation to control prejudice* (IMCP;) (Glaser & Kihlstrom, 2005; Glaser & Knowles, 2008; Park & Glaser, 2011; Park, Glaser, & Knowles, 2008). Although, conscious control of an unconscious process would seem to be a logical impossibility, Glaser argues that an initially conscious countervailing process can be automatized so that it, too, is evoked unconsciously by situational cues. For example, IMCP, as assessed by the Implicit Association Test (IAT;) (A.G. Greenwald, McGhee, & Schwartz, 1998), a popular method, based on reaction times, for assessing "implicit" or unconscious attitudes) moderated the tendency to shoot at Black targets in a "Shooter Task" in which subjects have to quickly decide whether a target is holding a weapon; conscious motivation, as assessed by typical self-report questionnaires, had no such effect (Glaser & Knowles, 2008). Similarly, IMCP reduced both discriminatory behavior (Park &

Glaser, 2011) and the effect of ego depletion on this reduction (Park et al., 2008). It should be noted, in passing, that Glaser's use of the label "implicit" is somewhat different from that of McClelland et al. (D.C. McClelland et al., 1989). Although Glaser believes that the motive to control prejudice is, indeed, unconscious, the important factor is that this motive has been automatized, so that it operates unconsciously, without deliberate intent, and more or less effortlessly.

Another perspective on the interplay of automatically and consciously elicited motives is offered by research on resistance to temptation by Fishbach and her colleagues (Fishbach, Friedman, & Kruglanski, 2003; Fishbach & Shen, 2014). She points out that conscious resistance to temptation may well fail, because it requires conscious awareness of what is happening, and also conscious effort, which may be difficult to maintain due to factors such as ego-depletion. On the other hand, like Glaser, she suggests that, with practice, conscious self-control may itself be automatized: the presence of a temptation may automatically activate the very long-term goals with which it would ordinarily compete. This inhibitory process can operate either when the conflict has been identified, reminding the people of their long-term goals, or when it has been resolved, activating strategies that strengthen resistance to temptation. Because automatic processes require neither conscious awareness nor conscious effort, they may be more likely to succeed than consciously deployed ones.

Is Motive Evocation Truly Automatic?

The distinction between automatic and controlled processes has deep roots in cognitive psychology (Moors, 2013), and the notion that some aspects of social

behavior occur automatically is both intuitively appealing and supported by empirical evidence. Still, there are problems with the popular idea that social behavior, including its motivational underpinnings, is *largely* automatic in nature (Kihlstrom, 2008).

In the first place, automaticity is not always rigorously defined in this literature. Early studies of automaticity in social cognition took pains to assure that the processing in question was truly automatic by assessing one or more canonical features, such as those listed in Table 1. For example, in his early studies Bargh presented primes while subjects were actively processing other targets – e.g., over the unattended channel in a dichotic listening task (Bargh, 1982), or in the peripheral field of vision during a vigilance task (Bargh & Pietromonaco, 1982). More recently, however, as in the experiments by Bargh et al. (2001) described earlier, automaticity is inferred merely from the fact that some behavior occurs incidentally, in the absence of specific instructions. In what might be called, with apologies to Daniel Patrick Moynihan (Moynihan, 1993), *defining automaticity down*, investigators do not always attempt to confirm that the ostensibly automatic process actually occurred outside focal attention, for example, or consumed little or nothing by way of attentional resources, or failed to interfere with other ongoing processes. Claims that motives are activated automatically and unconsciously are more convincing when investigators take the trouble to more rigorously define what they mean by “automaticity”.

The reliance on “incidental” processing is particularly problematic. The fact that subjects are not specifically instructed to perform some task or operation does not necessarily mean that it has been performed automatically. The subject’s manifest task, such as solving anagrams, may leave plenty of cognitive capacity available to

engage in other processing activities, such as mind-wandering (Singer, 1966; Smallwood & Schooler, 2006), if subjects choose to do so. In experimental situations, of course, one of those cognitive activities may be trying to figure out the real purpose of the experiment (Orne, 1962). If, for example, subjects notice that a large number of items in a word-finding puzzle relate to high achievement, they may suspect that this is not a random event, and in fact may be related to the purposes of the experiment. If so, they are unlikely to disclose this insight to the experimenter in a post-experimental debriefing, as that would invalidate their participation.

Moreover, researchers have rarely compared the differential power of automatic and controlled processes – or, alternatively, the relative contributions of automatic and controlled processes to tasks performance. Jacoby and his colleagues, for example, argue that every task contains automatic and controlled elements, and have developed the "process dissociation procedure" (PDP) to compare their relative contributions (Jacoby, 1991; Yonelinas & Jacoby, 2012). They do this by means of the *method of opposition* (MoP), which essentially pits automatic and controlled processes against each other. By the logic of subtraction, the differential strengths of the two kinds of processing can be estimated. The MoP and PDP, and similar techniques such as Sherman's QUAD model (Ferreira, Garcia-Marques, Sherman, & Sherman, 2006; Sherman, 2006a, 2006b), have been occasionally used in studies of attitudes, stereotyping, and moral judgment, (Payne & Cameron, 2014; Sherman, 2006b; Sherman, Krieglmeyer, & Calanchini, 2014), but they have not been employed in the study of automatic motives. For example, an investigator might use a variant of the MoP to pit automatic and controlled motives against each other, to determine just how

much of a role automaticity plays in goal-directed behavior. While it is plausible to suggest that some aspects of social motivation operate automatically and unconsciously, it remains to be seen just how potent auto-motives are.

That challenge would seem to be made more difficult by recent trends in the social priming literature, which tend to undermine not only the entire class of dual-process theories, but the operational definition of automaticity itself. Following earlier critiques (e.g.,) (Moors, 2016), Melnikoff and Bargh (Melnikoff & Bargh, 2018) have noted that there is imperfect alignment among the canonical features of automatic processing, such as those summarized in Table 1. For example, experimental research has identified some tasks where the underlying processes are intentional yet unconscious (e.g., skilled typing), and others in which a process is unconscious yet consumes working-memory capacity (e.g., insight learning). Moreover, Melnikoff and Bargh argue that even the definitions of the individual features are plagued by inconsistencies. With respect to efficiency, for example, Stroop interference – perhaps the cardinal example of automatic processing – is increased by loading spatial working memory, but eliminated by loading verbal working memory. In other words, whether Stroop interference occurs automatically depends on which aspect of working memory, generally considered to be a proxy for consciousness, is measured.

Melnikoff and Bargh (Melnikoff & Bargh, 2018) argue that, at the very least, dual-process theories need firmer empirical grounding, including investigations of the extent to which the four canonical features are misaligned. But they also suggest that the dual-process framework itself may be fundamentally flawed, and that the number of qualitatively distinct modes of processing may be much larger than two – maybe the 16

types implied by the combination of four properties taken two at a time; maybe more, taking into consideration the inconsistencies within the individual features. The paradox is that the same arguments against dual-process theories tend to undermine the operational definition of automaticity. Without at least some principled operational definition of automatic processing, some set of features converging on the prototype of automaticity (Garner, Hake, & Eriksen, 1956) how can we be sure that a motive has been automatically activated?

Motives as Expressions of Implicit Perception and Memory

In the auto-motive model, motives can be activated by goal-relevant situational cues that are consciously perceptible, even if they are processed automatically and unconsciously. However, in some experiments the assumption of automaticity is strengthened by the fact that the cues themselves are inaccessible to conscious perception or recall. Almost as a matter of definition, unconscious stimuli cannot be processed consciously; it follows, then, that they must be processed automatically. For example, visual cues can be presented parafoveally, outside the focus of attention; similarly, auditory cues can be presented over the unattended channel in dichotic listening. Cues can be presented subliminally, by virtue of masking or a similar manipulation; or a clearly perceptible cue can be lost to subsequent conscious recollection. In any event, cue-related changes in motivation can serve as expressions of implicit perception and memory (Kihlstrom, 2012; Kihlstrom et al., 1992). That is to say, we know that an item has been perceived or encoded in memory, even in the

absence of conscious perception or recollection, precisely because it exerts some effect on the subject's motivational state.

Many studies of auto-motives have employed variants on subliminal stimulation to evoke motives. In one of the earliest examples of this type, Silverman and his colleagues presented subjects with visual messages intended to arouse sexual, aggressive, or symbiotic motives of the sort specified by psychoanalytic theory, such as *Beating Dad is OK* for Oedipal aggression and *Mommy and I are one* for symbiotic desire (e.g.,) (Silverman, 1976; Silverman & Weinberger, 1985). In order to avoid conscious defense mechanisms, these messages were presented tachistoscopically, for only 4 milliseconds, at very low levels of illumination, so that they were invisible to the subject. Despite their presentation below the level of conscious perception, Silverman claimed that these subliminal stimuli had effects on subjects' behavior that were consistent with the predictions of psychoanalytic theory (for a methodological and theoretical critique of Silverman's work, see) (Balay & Shevrin, 1988); for a reply, see (Weinberger et al., 1989).

Effects of Masked Stimulus Presentation

A related technique for presenting primes outside conscious awareness accompanies stimulus presentation with a pattern mask, such as a row of hashmarks, which effectively precludes conscious perception (e.g.,) (Chartrand & Bargh, 1996; Shah & Kruglanski, 2002). For example, it is known that masked presentation of emotional faces can trigger corresponding affective reactions on the part of subjects (Niedenthal, 1990); see also (E. Anderson, Siegel, White, & Feldman Barrett, 2012).

Following masked presentation of happy or angry faces, Winkielman et al. engaged subjects in consumer preference task in which they were asked to sample and evaluate a beverage (Winkielman, Berridge, & Wilbarger, 2005). Subjects who were already somewhat thirsty poured and consumed more of the drink after priming by a happy face, and less after priming by an angry face. Although the subjects reported no significant change in conscious affect after this manipulation, the change in consummatory behavior suggests that unconscious positive or negative affect was induced by the happy or angry faces, modulating an unconscious consummatory motive in turn, which then affected the subjects' drinking behavior. Even in the absence of an alteration in subjective emotional state, the change in consummatory behavior shows that the masked faces were processed outside of awareness. In other words, the priming effect reveals the implicit perception of a stimulus that was not consciously perceived. .

In another example, Pessiglione et al. employed a reward-priming paradigm in which subjects received a reward based on the force of their grip on a hand dynamometer (Pessiglione et al., 2007). Coins representing the maximum payoff for each round (a penny or a pound, in the English system) were presented subliminally via masking. The subjects applied more force in the high-payoff condition, suggesting that the subliminal stimuli affected the incentive attached to each trial. Interestingly, fMRI showed a similar incentive effect on activation in the basal forebrain, part of the reward circuit in the brain. A later study employed lateralized presentation, and found the force effect only in the hand controlled by the hemisphere that processed the subliminal stimulus (Schmidt, Palminteri, Lafargue, & Pessiglione, 2010).

In massing evidence for their similarity principle, Huang and Bargh (Huang & Bargh, 2013) cite a number of studies which found that subliminal presentation of goal-relevant stimuli had the same effects on motive-relevant behavior as did supraliminal presentation. But conscious and unconscious reward information may not always have the same effects on performance. Zedelius et al. (Zedelius et al., 2014) have argued that conscious reward processing is necessary to integrate reward information with information about task demands and reward attainability. Moreover, conscious rewards permit subjects to strategically adjust their performance – for example, by modulating speed-accuracy tradeoffs. Conscious processing also allows subjects to deliberately adjust their effort on a task in response to changes in reward or performance; at the same time, however, conscious awareness of these matters can also be a distraction, and actually impair performance (Wegner, Ansfield, & Pilloff, 1998). Conscious awareness does have its advantages – not least because it is a logical prerequisite for conscious control. Still, it is clear that motivation can be modulated by cues and incentives presented unconsciously.

The Scope of Masked Priming

Just as the evocation of a relevant motive can confirm that a subliminal goal-relevant stimulus was, indeed, processed, subliminal stimulus presentation virtually guarantees that if a motive is evoked it will be evoked automatically, without conscious awareness or intent. For this reason, masked priming is a popular method in studies of automatic processing. However, masked stimulus presentation does present a number of procedural and interpretative difficulties.

First, it should be understood that masked priming is not, strictly speaking, subliminal (Dehaene, Changeux, Naccache, Sackur, & Sergent, 2006; Kihlstrom et al., 1992). "Subliminal", of course, means "below threshold", and many studies of subliminal perception have been criticized for inadequate procedures for determining the threshold for conscious perception (Draine & Greenwald, 1998; A.G. Greenwald, Draine, & Abrams, 1996). With masking, the term "subliminal" is something of a misnomer, because the prime itself is presented at an intensity, and for a duration, that would normally make it perfectly visible, if it were not for the masking stimulus. But for the purposes of this review, the term "subliminal" refers both to stimuli that are strictly subliminal, by virtue of their intensity or duration (a procedure hardly ever used anymore), and those that are presented at supraliminal intensities or durations but rendered invisible by means of masking.

In fact, Cheesman and Merikle have distinguished between *two* thresholds: the *subjective threshold* is the level at which subjects claim not to be able to detect the stimulus, while the *objective threshold* is the level at which the stimulus has no effect on behavior (Cheesman & Merikle, 1985). Subliminal priming occurs in the region between the subjective and objective thresholds (see Figure 1). The relations between prime and mask are critical (Cheesman & Merikle, 1984). If the interval between the prime and the mask (known as the stimulus-onset asynchrony, or SOA) is too long, the prime will be clearly visible, because it falls *above* the subjective threshold. If the prime-mask SOA is too short, the prime will not be processed at all, because it falls *below* the objective threshold. The optimal prime-mask SOA appears to be about 17-34 milliseconds: any

prime-mask SOA longer than that risks allowing the prime itself to be consciously perceived.

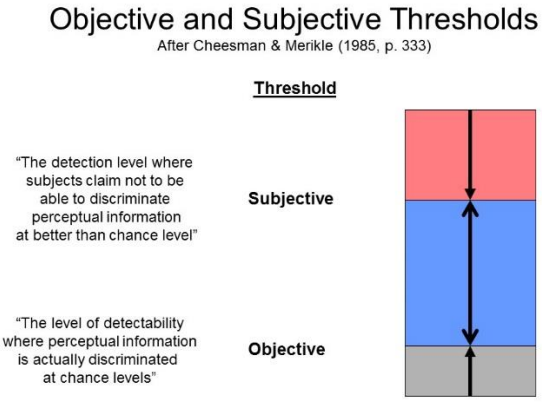

Figure 1. Depiction of objective and subjective thresholds, after Cheesman & Merikle (1985).

Equally critical is the prime-target SOA – that is, the interval between onset of the prime and the onset of the task the prime is intended to influence. Studies of masked semantic and affective priming suggests that masked priming dissipates quite quickly, over intervals of less than 1 second. This last point is crucial, because in studies using masked priming to activate motives, the interval between presentation of the prime and onset of the target task (in which the motive is displayed) is, almost necessarily, much longer than that – which would seem to militate against getting any priming at all.

The potential relevance of prime-target SOA is illustrated by recent study of semantic priming by Muscarella and her colleagues (Muscarella, Brintazzoli, Gordts, Soetens, & Van den Bussche 2013). Their first study employed familiar product logos (e.g., Macdonald's arches, the Nike swoosh) as primes in a lexical decision task where the targets were related and unrelated brand names (e.g., *Macdonald's*, *Nike*) and words (e.g., *hamburger*, *sport*). Their first study employed a 17 or 34 ms exposure for the prime, which was preceded and followed by a masking stimulus (most experiments

on masked priming employ exposures and SOAs in multiples of 17 ms, as that is the refresh rate of the typical computer screen). The former duration is typical in studies of masked priming; the latter is sufficient to enable the prime to be consciously perceived. The study also employed the prime-target SOAs of 334, 1000, and 5000 ms. Significant "brand priming" was observed under all three SOAs – but, as might be expected, progressively diminished as the prime-target SOAs lengthened. However, a second experiment, employing an even shorter duration for the prime (11.7 ms), yielded the opposite pattern: brand-priming actually *increased* from the shortest to longest prime-target SOAs. To complicate things further, an earlier experiment by the same research team, employing a 17 ms stimulus exposure and 334 ms prime-target SOA yielded no evidence of priming (Brintazzoli, Soetens, Deroost, & Van, 2012).

Further research will be necessary to clarify this issue. It is possible, as Bargh et al. (Bargh et al., 2001) have argued, that goal-priming effects strengthen with time, somewhat along the lines of hypermnesia effects occasionally found in memory, (Erdelyi, 2004; Kihlstrom, 2004a). More likely, however, it follows the same path as other forms of meaning-based masked priming, which is to dissipate rapidly. On the other hand, it is possible that priming interacts with currently active motivational states (Kruglanski, Chernikova, Rosenzweig, & Kopetz, 2014). As in the Winkielman et al. (Winkielman et al., 2005) study, a subject who is already thirsty when primed with *drink* may be more prone to sample a proffered beverage, even after a considerable prime-target SOA.

Masked priming is not just limited in temporal terms, by the prime-mask and prime-target SOAs. It is limited by the quality as well as the quantity of processing the

prime receives. All forms of priming depend on the encoding of some representation of the prime. Perceptual priming depends on the availability of a perception-based representation of the physical features of the stimulus and its spatiotemporal relations with other stimuli – for example, the letters in a word, and their relations to each other. Semantic priming depends on the encoding of a meaning-based representation of the denotative or connotative meaning of the prime and its semantic and categorical relations with the target and other words. Presumably, masked priming of a motive depends on semantic analysis of the prime, and that in turn may depend on the prime-mask SOA. For example, semantic priming may be stronger when the prime is presented close to the subjective threshold; when the prime is presented close to the objective threshold, semantic priming may be relatively weak.

Even under optimal circumstances, though, masked semantic priming appears to be analytically limited. Studies of affective priming by Greenwald (A. G. Greenwald, 1992) (fn.8) indicate that the connotative meaning (positive or negative) of a single-word prime such as *enemy* can facilitate evaluative judgments of an affectively congruent target such as *loses*. But Greenwald has been unable to obtain masked affective priming with even a two-word phrase such as *enemy loses* -- a phrase consisting of two affectively negative words which, when combined, have an affectively positive connotation. Apparently, the temporal boundaries of masked priming are sufficient to permit analysis of the meaning of a single word, but not that of a two-word phrase – much less a long, ambiguous phrase like *Mommy and I are one*. All of which is not to say that motivational states cannot be influenced by subliminal or masked primes; only that it may be very difficult to show convincingly that this is so.

Implicit Motives

In most of the studies previously described, automatic processes or preattentive stimuli have effects on conscious motivation. Now it is time to turn to the question originally raised by McClelland et al. (1989): whether motivational states, themselves, operate outside of the subject's phenomenal awareness. Traditional self-reports of motivation, such as those collected by the Adjective Check List (ACL;) (Gough & Heilbrun, 1965), the Edwards Personal Preference Schedule (EPPS;) (Edwards, 1959), or the Personality Research Form (PRF;) (Jackson, 1967) are obviously unsuitable for assessing unconscious motives: subjects cannot report on something they don't know. Accordingly, from an early stage in his research program McClelland preferred "indirect" motive measures such as Murray's Thematic Apperception Test (TAT;) (Murray, 1943) to "direct" measures like questionnaires (deCharms, Morrison, Reitman, & McClelland, 1955). Later, McClelland embraced a distinction introduced by B.F. Skinner (Skinner, 1935), his Harvard colleague, between "operant" (performance) and "respondent" (self-report) measures of motivation (D.C. McClelland, 1980), before settling on the explicit-implicit formulation. In either case, McClelland believed that performance measures of motivation were superior to self-report measures – a preference that he extended to intelligence tests as well (D. C. McClelland, 1973). Of, course, by their very nature self-reports cannot reflect unconscious motives or any other unconscious features of personality.

To that end, McClelland introduced the "Picture-Story Exercise" (PSE) as the preferred method for assessing implicit motives (Figure 2). In the PSE, as in the TAT,

subjects are asked to generate a story in response to a picture selected to tap internal motives, such as the needs for achievement (*n*Ach;) (D.C. McClelland et al., 1953), power (*n*Pow;) (Winter, 1973), and affiliation or intimacy (*n*Int;) (McAdams, 1989). The stories are then coded with an empirically derived content-analysis scheme to yield an assessment of the individual's standing on the motive in question (Pang, 2010; Schultheiss & Pang, 2007; Schultheiss & Schultheiss, 2014). But nowhere are subjects asked to introspect, or report, on their motives as such.

Figure 2. A prodigy being called to the stage, or a boy wishing he were outside playing baseball? Actually, a photograph of the 20th-century violin virituoso Yehudi Menuhin, age 12 (in the public domain; image scanned from an original photograph by Samuel Lumiere in the National Library of France). Another portrait from this series, redrawn by Christiana Morgan, served as the basis for Card 1 of the TAT (Jahnke & Morgan, 1997).

Dissociating Explicit and Implicit Motivation

The idea that the PSE assesses unconscious motives was not entirely new. Murray himself had assumed that subjects might not be aware of some of their salient motives, but that they would identify with, and project their own internal needs onto, the "hero" or protagonist of their stories (Lindzey, 1952; Lindzey & Kalnins, 1958). He made this clear in his manual for the TAT: "[T]he content of a set of TAT stories represents second level, covert... personality, not first level, overt or public... personality.... [T]he TAT is one of the few methods available today for the disclosure of covert tendencies" (Murray, 1943) (p. 16). And Lindzey (Lindzey, 1952) noted that "The dispositions and conflicts that may be inferred from the story-teller's creations are not always reflected directly in overt behavior or consciousness" (p. 3). Reviewing the early literature on the test, he concluded that "the assumed imperfect correlation" between "fantasied and overt behavior is warranted" (p. 20). But the evidence itself had more to do with the relation between TAT scores and overt behavior – i.e., the external validity of the TAT -- than with the relation between conscious and unconscious motives.

More recent studies have operationalized conscious motivation in terms of subjects' self-reports on personality questionnaires. McClelland et al., for example, reported very low correlations betwen PSE and questionnaire measures of *n*Ach, *n*Pow, and *n*Aff (unweighted, unsigned aggregate r = .11;) (D.C. McClelland et al., 1989). Spangler (Spangler, 1992), reviewing 36 studies employing both TAT/PSE and questionnaire measures of *n*Ach, reported an average correlation of .00. A more recent meta-analysis by Kollner and Schultheiss (Kollner & Schultheiss, 2014) oftained average correlations of .14 for *n*Ach, .12 for *n*Aff, and .04 for *n*Pow. Although all these

aggregate correlations are statistically significant, they are low even by the standards of personality research (Mischel, 1968). As such, they provide *prima facie* evidence of a dissociation between explicit, conscious and implicit, unconscious motives.

Are Implicit Motives Truly *Unconscious*?

Of course, a cynic might reply that the PSE is simply a poor measure of motivation, which explains why it does not correlate with established self-report methods. And, indeed, the TAT and related measures have been criticized on psychometric grounds almost since their inception – particularly for their ostensibly low reliability (e.g.,) (Entwisle, 1972). On the other hand, as noted even as early as Lindzey (Lindzey, 1952), there is a great deal of evidence for the validity of TAT-like measures, in that they actually predict subjects' performance on various motive-related tasks (for comprehensive coverage, see) (Schultheiss, 2008; Schultheiss & Brunstein, 2010). As McClelland himself often pointed out, if a test is valid, it must perforce be reliable (because, in psychometric terms, a test cannot correlate higher with an external criterion than it does with itself). McClelland also argued that test-retest reliability, at least, was problematic for measures of motivation, because a motive discharged at the time of an initial test might not have recharged at the time of the retest: once we've eaten, we're not hungry again for a while. In any event, problems with inter-rater reliability, created by the lack of an explicit scoring manual for the TAT comparable to those developed for the Rorschach (e.g.,) (Beck, 1944), have been solved by the availability of clear manuals for scoring various motives on the PSE (e.g.,) (Schultheiss & Pang, 2007; C. P. Smith, 1992; Winter, 1991).

Still, a low correlation between explicit and implicit measures of motivation is only the first step in establishing a dissociation between explicit and implicit motives. There are many reasons why such correlations could be low, besides the fact that the variables in question reflect different levels of consciousness. To understand why this is the case, it will help to analyze explicit and implicit motivation in terms of the multitrait-multimethod matrix introduced by Campbell and Fiske (Campbell & Fiske, 1959), as illustrated in Table 2. Consider two traits – e.g., *n*Ach and *n*Pow; there are two explicit measures of each trait – e.g., a 0-10 self-rating scale and a self-report questionnaire; and there are two implicit measures of each trait – e.g., the PSE and a reaction-time measure such as the Implicit Association Test (IAT;) (Banaji & Greenwald, 2013; A.G. Greenwald et al., 1998).

- In the table, the diagonal represents the reliability of each individual measure – i.e., its reliability. This value should be very high – ideally, a correlation approaching a perfect 1.0.
- Measures that share both trait variance (e.g., both are measures of *n*Ach) and method variance (e.g., both are explicit measures) should be highly correlated – perhaps, achieving correlations as high as .70 or so.
- Measures that share neither trait variance nor method variance have nothing in common, and should be essentially uncorrelated, with correlations of approximately 0.
- Measures of two different traits (e.g., self-reports of *n*Ach and *n*Pow) may be significantly correlated simply because they have some method variance in common – though such correlations should be relatively low.

- In principle, any two measures of the same trait should be significantly correlated. The exception is when the two measures differ on the explicit-implicit continuum: to the extent that implicit motivation can be dissociated from explicit motivation, the correlation between the two measures should be as low as possible approaching zero.

Table 2
Explicit and Implicit Methods in the Multitrait-Multimethod Matrix

		Method							
		Exp_1	**Exp_2**	**Imp_1**	**Imp_2**	**Exp_1**	**Exp_2**	**Imp_1**	**Imp_2**
Method	**Trait**	***n*Ach**				***n*Pow**			
Exp1	***n*Ach**	1.00							
Exp2	***n*Ach**	.80	1.00						
Imp1	***n*Ach**	.10	.10	1.00					
Imp2	***n*Ach**	.10	.10	.80	1.00				
Exp1	***n*Pow**	.30	.30	.00	.00	1.00			
Exp2	***nPow***	.30	.30	.00	.00	.80	1.00		
Imp1	***n*Pow**	.00	.00	.30	.30	.10	.10	1.00	
Imp2	***n*Pow**	.00	.00	.30	.30	.10	.10	.80	1.00

The situation is somewhat analogous to the Implicit Assciation Test (IAT; Greenwald et al., 1998; see also Banaji & Greenwald, 2013), a reaction-time method which which is widely considered to be a measure of unconscious attitudes and prejudice. In fact, the correlation between IAT and self-report measures of attitude, such as an “attitude thermometer”, are relatively low: across the 56 attitude domains reviewed by Nosek, for example, the median correlation was .48 (Nosek, 2007). But again, this is not enough to establish the IAT as a measure of *unconscious* attitudes. Setting aside problems specific to interpretation of the IAT as a measure of attitudes (Arkes & Tetlock, 2004; Blanton et al., 2009; Kihlstrom, 2004b), it might be that implicit tests are simply unobtrusive measures which tap attitudes or motives of which the person is perfectly well aware -- but which, for whatever reason, he or she declines to

disclose to the experimenter (Webb, Campbell, Schwartz, & Sechrest, 1966). Supporting this hypothesis is the finding that, across 217 research reports surveyed in a recent meta-analysis, the external validity of the IAT was significantly higher in studies that found a relatively high implicit-explicit correlation (Kurdi et al., 2018).

The explicit-implicit correlations involving the PSE are certainly lower than those typically observed with the IAT, which strengthens the case for dissociation, even if it does not clinch it. Thrash and his colleagues have proposed a general framework within which to explore the apparent incongruence between explicit and implicit motives (Thrash, Cassidy, Maruskin, & Elliot, 2010). For example, they sugest that if explicit and implicit motives have different antecedents, they will show little overlap; if they have the same antecedents, the overlap will be greater. The congruence between the two classes of motive measures can also be influenced by overlap in unidentified "random error" variables (e.g., a fire alarm that goes off during one of the tests), systematic "confounding error" variables (e.g., a third variable that is correlated with both the explicit and implicit measures), or, simply, observed indicators (e.g., response to the PSE, but not to a questionnaire, may be influenced by whether the subject likes to write stories). Although Thrash et al. begin their discussion with the assumption that explicit motives are consciously accessible while implicit motives are unconscious, consciousness is not necessarily an element in their framework. In fact, their framework is so general that it could be used to explore the relations between any two constructs, regardless of whether one is conscious and the other not. They do suggest that social desirability might be correlated with conscious motive expressions, but not unconscious

ones; but this could also differentiate between obtrusive and unobtrusive measures of conscious motives.

Thrash et al. also point out that an aggregate correlation near zero can obscure the existence of subgroups for whom the variables in question are quite highly correlated. Accordingly, some studies have attempted to identify dispositional variables which might moderate the correlation between explicit and implicit measures of *n*Ach (for full reviews, see Thrash et al., 2010; Thrash, Maruskin, & Martin, 2012). In a study by Thrash and Elliot (2002), for example, the correlation was -.07 for subjects low in self-determination and .40 for subjects high in self-determination. A later study found greater explicit-implicit congruence in individuals who are high in private body consciousness or preference for consistency, and in those who are low in self-monitoring (Thrash, Elliot, & Schultheiss, 2007). Schattke et al. found higher explicit-implicit congruence for adults who, as children, had experienced higher levels of autonomy and relatedness (Schattke, Koestner, & Kehr, 2011).

In establishing unconscious motivation, though, it is important that the variables moderating the explicit-implicit dissociation clearly relate to consciousness. Individuals high in private body consciousness might be more aware of their internal motivational states, leading to greater congruence between explicit and implicit motivation – but, perhaps, only if those motives are embodied in the way that hunger and thirst are. Self-monitoring and a preference for consistency do not, intuitively, bear on consciousness, and the moderating effect of these variables is also consistent with an interpretation of PSE as an unobtrusive measure of conscious motivation.

It could also be the case that the implicit and explicit measures tap two quite different constructs, or at the very least nonoverlapping aspects of the same construct. For example, the PSE could assess aspects of *n*Ach which are missed by questionnaires, or vice-versa. Schultheiss and his colleagues addressed this possibility by writing new questionnaire items for *n*Ach which precisely parallel the coding categories of the PSE. In a study by Thrash and colleagues, the correlation between PSE and a standard questionnaire measure of *n*Ach was .00; substituting the matched-content PSE-based questionnaire raised the correlation with PSE to .17 (Thrash et al., 2007). Correlations of this magnitude are not very high, of course – which strengthens the case that the low correlations observed between explicit and implicit measures of motivation are not an artifact of differences in construct definition.

A similar point could be made with respect to differential validity. The PSE predicts actual behavior on motive-relevant tasks, establishing its validity as a motive measure, but McClelland et al. (1989) argued that the dissociation between explicit and implicit motivation was supported by the fact that the two sorts of measures predicted performance on very different kinds of tasks. In brief, implicit *n*Ach predicts performance on “operant” tasks but not “respondent” tasks, especially under conditions of incentive, while the reverse is true for explicit motives tasks (Schultheiss & Brunstein, 2010; Spangler, 1992). On the surface, this double dissociation is very compelling – although the correlations in question are not strong even by the standards of personality research. On the other hand, for the most part the validation tasks employed in these studies have little to do with consciousness per se. Therefore, while the PSE and questionnaires may predict different kinds of motivated activity, that does not

necessarily mean that the PSE taps motives which are inaccessible to conscious awareness.

Perhaps the greatest impediment to accepting the dissociation between explicit and implicit motives is that the tests that measure them are so *different*. The ACL, EPPS, and PRF are self-report questionnaires, while the PSE involves the coding of storytelling behavior. The lack of correlation between them, then, may be as much a matter of method variance as anything having to do with consciousness. In the study by Schultheiss et al. (2009), for example, the within-method correlations among PSE measures of *n*Ach, *n*Pow, and *n*AFF were higher (.19-.31) than the heteromethod correlations involving the explicit and implicit measures of the same motives. None of the correlations in this study were very high, but the fact that, in aggregate, the correlations among PSE measures of different motives were the highest obtained is cause to worry about the degree to which the entire pattern of results is contaminated by method variance.

In the cognitive domain, the most convincing explicit-implicit dissociations are found in the domains of memory and perception, where investigators take great care to be sure that the cues presented to the subjects remain constant between the explicit and implicit tests, which vary only in their demands for conscious processing (Graf, Squire, & Mandler, 1984). In an experiment on implicit memory, for example, subjects might study a word such as *ashcan*. After a retention interval, they might be presented with a word stem such as *ash*___ and asked to complete the stem with a word from the studied list – a task requiring conscious recollection; or they might be asked simply to complete the stem with the first word that comes to mind – a task that does not require

episodic memory at all. In Jacoby's (1991) PDP procedure, conscous recollection and unconscious priming are separated by asking subjects to complete the stem with a word that *did not* appear on the study list; if the studied word appears anyway, Jacoby infers that this is due to unconscious, automatic priming. In any case the cues remain constant, and the tasks vary in terms of whether they require consciousness or not.

Cue-matching is not a problem unique to the PSE. The IAT has the same problem, as does implicit learning, and the problem has the same effect: it undercuts the conclusion that the motives assessed by the PSE are really unconscious in the sense that implicit percepts and memories are. Some progress in this direction was achieved by Schultheiss et al. (2009). These investigators asked subjects to imagine themselves to be one of the characters in each of the PSE stimuli, and then respond to a series of questions bearing directly on the PSE coding categories (Schultheiss, Yankova, Diritkov, & Schad, 2009). Scores for *n*Ach, *n*Aff, and *n*Pow derived from this "PSE Questionnaire" (PSE-Q) showed little overlap with those derived from the standard PSE, with correlations ranging from .11 to .18. In a later study, employing depressed patients and adult controls instead of college students, the explicit-implicit correlations were higher but still generally low, ranging from -.25 to .24 (Neumann & Schultheiss, 2015). Then again, in the earlier study, PSE-Q scores also showed little overlap with explicit questionnaire measures of these motives, with correlations ranging from .08 to .23 (Schultheiss et al., 2009). On these grounds, it is hard to identify PSE-Q with explicit motivation – which leaves us with not two but *three* quite different motive assessments, none of which correlate very highly with each other. Maybe these instruments are measures of different constructs after all.

Alternative Assessments of Implicit Motivation

Research on implicit motivation has now matured to the point that there are several alternative assessments of implicit motivation available for researchers to use. In addition to the standard PSE, there are several variants on the PSE. In the Operant Motive Test (OMT), for example, subjects are presented with a motive-evoking picture, as in the standard PSE; but instead of writing a story, they answer a series of four questions about one of the main characters (Runge et al., 2016). In the Multi-Motive Grid (MMG), subjects also view pictures, but then answer specific questions about what is going on in the minds of the characters (Sokolowski, Schmalt, Langens, & Puca, 2000). These variants retain the essential features of the PSE: subjects are presented with pictures, but are not asked about their own motives. A comparative study of *n*Ach, *n*Pow, and *n*Aff found that all three implicit motivation measures showed very low correlations with three explicit measures, with a median $r = .05$; unfortunately, the intercorrelations among the three implicit measures were hardly better, median $r = .09$. By contrast, the three explicit measures showed consistently significant (if still low) intercorrelations, median $r = .31$ (Schüler, Brandstätter, Wegner, & Baumann, 2015). A verbal version of the MMG, in which brief vignettes substituted for the pictures, showed generally nonsignificant correlations with questionnaire measures (median $r = .18$); this figure is only slightly higher than that obtained with the standard pictorial version (median $r = .11$); unfortunately, the between-groups design of the study did not permit assessment of the relationship between the two forms of the MMG (Krumm, Schäpers, & Göbel, 2016).

As an alternative to TAT-like assessments of implicit motivation, Brunstein and Schmitt (2004) developed a version of the IAT to measure *n*Ach: its scores were uncorrelated *r* = -.07) with scores on an explicit self-rating measure. Three subsequent studies confirmed essentially zero correlations between IAT scores and self-ratings; on the down side, however, they found only modest correlations between IAT and PSE, (median *r* = .27; Brunstein & Schmitt, 2010). One factor that might account for this lack of convergence between implicit motive measures is a difference in format: the PSE employs pictorial stimuli, whereas the stimuli in the IAT are verbal. Accordingly, Slabbinck and his colleagues introduced "pictorial-attitude" versions of the IAT (PA-IAT), in which subjects make judgements concerning motive-relevant situations (Slabbinck, De Houwer, & Van Kenhove, 2011). In a comparative study, Slabbinck et al. (2011) found that the PA-IAT measure of *n*Pow correlated significantly (*r* = .31) with the PSE measure, but was essentially uncorrelated with questionnaire measures of dominance and aggression.

Following up on a factor-analytic study by King (1995) Blisky and Schwartz (2008) employed the multitrait-multimethod matrix (Campbell & Fiske, 1959) to explore the relationships among TAT-like implicit and questionnaire-like explicit measures of *n*Ach, *n*Pow, and *n*Aff. Multidimensional scaling applied to the data of five previously published studies (including King's) revealed that explicit and implicit assessments of the same motive lined up together, providing evidence of significant shared trait variance between explicit and implicit methods despite near-zero correlations beween implicit and explicit measures. Like King, they argued that the various methods of motive assessment could be arrayed along a continuum from more vs. less explicit

(e.g., self-ratings vs. questionnaires), to less vs. more implicit (e.g., autobiographical memories vs. TAT/PSE). It is not yet known how the IAT fits into this scheme.

Can Motivation Be Unconscious?

Within the domain of cognition, there is now widespread agreement that episodic memories can be unconscious; so can percepts, and so can thoughts. All are revealed by priming effects observed in carefully controlled experiments. Given the evidence for the cognitive unconscious, it seems reasonable to ask whether the explicit-implicit distinction can be extended beyond cognition to emotion and motivation. It appears that motives can be activated automatically, and unconsciously, by relevant environmental cues, even when these cues themselves are processed outside conscious awareness. However, this claim needs to be supported by research which employs more rigorous criteria for automaticity; and which assesses the differential contributions of automatic and controlled processes to task performance. Similarly, initial results support the idea that implicit, motives, as assessed by techniques such as the PSE, are uncorrelated with explicit motives, as assessed by self-report questionnaires.

Currently, however, evidence is lacking that the implicit motives assessed by the PSE are really inaccessible to conscious awareness, in the same sense that implicit percepts and memories are. There is no reason to think that motives and goals *cannot* be unconscious, and nevertheless influence experience, thought, and action; but further research is needed to make the case convincingly. In particular, it is important to show that implicit motive assessments are uncorrelated with explicit measures of the same motives, employing assessments which are as closely matched in their cue value as

possible, differing only in their demands for conscious awareness of the motive in question. At this point, however, the status of unconscious motivation remains: plausible on conceptual grounds, but not yet proven.

Author Notes

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