Implicit Motives

Chapter 9

Properties of Motive-Specific Incentives

Steven J. Stanton
Duke University

Julie L. Hall
University of Michigan

Oliver C. Schultheiss
Friedrich-Alexander University

Appeared as: Stanton, S. J., Hall, J. L., & Schultheiss, O. C. (2010). Properties of motive-specific incentives. In O. C. Schultheiss & J. C. Brunstein (Eds.), *Implicit motives* (pp. 245-278). New York, NY: Oxford University Press.

Overview

Over the past 50 years, motivation theorists have generally agreed that implicit motives represent capacities to experience specific classes of incentives as rewarding (see Atkinson, 1957; McClelland, 1987; Schultheiss, 2008). Thus, individuals high in the need for achievement (*n* Achievement) find pleasure in mastering challenging tasks; individuals high in the need for power (*n* Power) get a kick out of having impact on others; and individuals high in the need for affiliation (*n* Affiliation) enjoy having close, harmonious contact with others. An important consequence of implicit motives' capacity to affectively charge incentives is that they orient attention and energize and select behaviors aimed at attaining these incentives (McClelland, 1987).

However, despite the nominal importance theorists have ascribed to motive-specific incentives, their exact properties have remained strangely undefined in the past. We believe that this state of affairs has hindered theoretical and empirical advances in the field because a key ingredient for a more thorough understanding of motives, what they are and how they operate, has been missing. This has led to a somewhat insular existence of motive research outside of mainstream personality psychology, social psychology, and biopsychology, the three disciplines traditionally most concerned with motivation. At the same time, the relative lack of precision inherent in the definitions of motives and particularly their incentives has led to a Babylonic proliferation of motive measures and theories that often do not share much except the name with the original concepts and measures developed by McClelland and colleagues (see McClelland, Koestner, & Weinberger, 1989, for a discussion of this issue). Neither development was apt to move research on implicit motives forward in great and confident strides. As deplorable as this outcome may be, we suggest it can be revised to a large extent by going back to the incentive concept at the core of implicit motive research and defining and testing it rigorously.

In the present chapter, we aim to move in this direction by tracing in the first half the conceptualization of motive-specific incentives from their origin in McClelland, Atkinson, Clark and Lowell's (1953) pioneering work on the achievement motive through its metamorphoses in the work of McClelland and his associates (McClelland, 1980; McClelland et al., 1989) to the information-processing account of implicit motivation formulated by Schultheiss (2001, 2008). In the second half of the chapter, we will present a motivational field theory of motivational incentives, proposing that nonverbal social signals, specifically facial expressions of emotion, function as incentives for implicit motives. We will argue that nonverbal signals indicating the sender's dominance versus submission represent incentives for power-motivated individuals and that nonverbal signals indicating the sender's friendliness versus hostility represent incentives for

affiliation-motivated individuals. We will review studies in support of this model and also discuss emerging evidence for a role of nonverbal social signals in achievement motivation arousal.

Conceptual Accounts of Motive-Specific Incentives

Conditioned Incentives: The McClelland et al.(1953) Affect-Redintegration Model

In *The Achievement Motive*, the culmination of several years of research on the development, validation, and conceptual grounding of a measure of the need to achieve, McClelland et al. (1953) provided a first speculative sketch of what kinds of incentives implicit motives respond to. They defined the achievement motive as a concern with meeting or surpassing a standard of excellence when dealing with a task. They developed the original *n* Achievement measure by manipulating the motivational state of research participants (e.g., by having them succeed or fail at challenging anagram tasks or giving them no feedback at all about their performance) and then having participants write imaginative stories about pictures showing people in achievement-related situations. Stories were then scrutinized for differences between motivational-arousal conditions, and the coding system for *n* Achievement was thus developed. The picture story measure of *n* Achievement turned out to be a good predictor of task performance when the task was challenging and provided immediate feedback about how well participants did (e.g., because a given problem could be solved or not). In contrast, tasks that either provided no challenge or were much too difficult to be solved or on which participants could not tell how well they were doing did not elicit superior performance in individuals high in *n* Achievement.

To account for the way *n* Achievement selectively enhanced performance on challenging tasks (but not easy or difficult tasks), McClelland et al. (1953) developed the affect-redintegration model of motivation. According to this model, people learn to associate specific cues with a subsequent change in affect. In the case of *n* Achievement, the cue is the perception of a

challenging task, and the subsequent affective change is the pleasure of solving it. Thus, the prospect of pleasure triggered by the moderate difficulty inherent in a task becomes the incentive for achievement-motivated individuals to work hard on challenging tasks. However, the theory was not limited to *n* Achievement but was designed by McClelland et al. (1953) to account for other motives, such as *n* Power or *n* Affiliation, too.

McClelland et al.'s (1953) theory of motivation went far beyond the then prevailing motivational theories based on drive reduction and is much closer to the incentive accounts of motivation (e.g., Bindra, 1978; Toates, 1986) that would eventually replace them. Like these more modern theories, the affect-redintegration model presents a Pavlovian-conditioning account of motivational incentives: A motive-specific incentive is a cue (e.g., task difficulty) that reliably predicts a rewarding affective state (e.g., the pleasure of mastery). As a consequence, the cue itself takes on affective meaning, which, in the case of *n* Achievement, can even turn the negative connotations associated with task difficulty into something positive and desirable because it portends better things to come (for a modern version of this line of reasoning, see Eisenberger's 1992 theory of learned industriousness).

Despite its conceptual rigor, the affect-redintegration model of achievement motivation—like several other promising concepts introduced in McClelland et al.'s 1953 volume—had only very limited impact on subsequent research. Direct empirical tests of the validity of the model were not conducted by McClelland, Atkinson, and their associates, owing perhaps to the lack of suitable testing paradigms for the assessment of Pavlovian conditioning in humans at the time the model was introduced. The first direct test for a relationship between implicit motives and Pavlovian conditioning was eventually conducted more than 50 years later (Stanton, Wirth, & Schultheiss, 2006; see below). Moreover, no systematic effort was made in subsequent research to apply it to other domains of motivation, despite its explicit designation as a general model of

motivation. Finally, the model did not specify what sorts of cues were particularly suitable for arousing a motive. Although the authors used nonverbal cues from animal experiments as examples throughout much of their presentation of the theory, they presented verbal cues in most of their studies to arouse the achievement motive. However, whether these verbal cues were actually the effective ingredients of the experimental manipulations is somewhat doubtful, as we will discuss below.

After the affect-redintegration model was introduced, interest in the development of new and better conceptual accounts of motivational arousal languished for several decades. This does not imply that no new theories were developed in the field—Atkinson's (1957) risk-taking theory of achievement motivation is probably the most famous and influential example. But these were theories about particular motives and what factors they interact with, not overarching accounts of motives and their mode of operation. Still, the seeds for such a theory were already laid in the 1953 volume. Several case studies presented toward the end of "The achievement motive" revealed what would become a hallmark of motives assessed with the PSE: Achievement scores derived from picture stories failed to correlate with the level of achievement motivation that the individuals tested for these case studies ascribed to themselves on a questionnaire. They also failed to correlate with the judgments of clinical psychologists and psychiatrists acquainted with these individuals. McClelland et al. (1953) concluded from this "that people's perception of achievement motivation and achievement motivation itself are two different things" (p. 327).

A classic study by deCharms, Morrison, Reitman, and McClelland (1955) underscored the fundamental validity of this insight. *n* Achievement as assessed with the PSE not only failed to correlate with achievement motivation measured per self-report, but the PSE and self-report measures also predicted different types of behavior: PSE-based achievement scores predicted actual performance on an anagram task, but not judgments of art or other people, whereas self-

reported achievement motivation predicted such judgments, but not anagram performance. Despite the findings of this study, no further attempts were made to translate the insights gained from this type of research into a general model of (implicit) motivation. With hindsight, this is unfortunate, because the lack of systematic differentiation between motivation assessed per PSE versus motivation assessed per self-report led to a long turf war between proponents of the PSE and researchers using questionnaire measures of motivation, with each side arguing that the other measure lacked validity because it did not correlate with one's own measure and did not predict the same behavioral phenomena (e.g., Entwisle, 1972; Lilienfeld, Wood, & Garb, 2000; McClelland, 1980).

McClelland, Koestner, and Weinberger's (1989) Dual-Systems Model of Motivation

McClelland (1980) made a first attempt to transcend this state of affairs by arguing that motives as assessed by the PSE are good at predicting spontaneously occurring or *operant* behavior, particularly over extended periods of time, whereas motives assessed by questionnaire are good at predicting immediate choices in response to specific, identifiable social stimuli and demands (*respondent* behavior). Moreover, PSE-based motive measures do not predict respondent measures well, and questionnaire-based motive measures perform poorly when predicting operant behavior.

McClelland et al. (1989; see also Weinberger & McClelland, 1990) extended and refined McClelland's (1980) distinction between PSE- and questionnaire-based measures of motivation. Adopting the distinction between implicit and explicit processes from research on learning and memory (e.g., Schachter, 1987), they introduced the term *implicit motive* for motivational needs assessed with the PSE and *explicit (or self-attributed) motive* for needs assessed per self-report. They also introduced domain-specific incentives as a key moderator of the effects of implicit and explicit motives on operant and respondent outcomes. Specifically, the presence of task-intrinsic

incentives, that is, aspects of a task that are inherently rewarding for individuals high in a given motive, represents a necessary prerequisite for implicit motives to become aroused and to affect operant behavior. Conversely, the presence of social-extrinsic incentives, that is, social rewards, explicit instructions, and demands, is a necessary condition for explicit motives to become activated and influence respondent behaviors. McClelland et al. (1989) also argued that social-extrinsic incentives should not be arousing for implicit motives and task-intrinsic incentives should not be arousing for explicit motives.

Although the supporting evidence presented by McClelland et al. (1989) was not particularly straightforward, concurrent and subsequent research by other scholars corroborated the fundamental heuristic validity of their two-level Motive × Incentive × Behavior Model of Motivation. For instance, Brunstein and Hoyer (2002; see also Schultheiss & Brunstein, 2005, for an English description of this study and its findings) predicted and found that participants with a high implicit achievement motive, relative to those low in this motive, respond to task performance feedback (task-intrinsic incentive) by increasing their actual performance on an attention task (operant behavior). Participants with a high explicit achievement motive, in contrast, responded to information about how well they were doing vis-à-vis other participants (social-extrinsic incentive) by choosing whether to continue the task or do something else (respondent behavior). Notably, participants' implicit achievement motive neither responded to social-extrinsic incentives, nor did it predict the choice to continue the task. Conversely, participants' explicit achievement motive was not influenced by task performance feedback and did not predict actual task performance. For the domain of *n* Achievement, these findings were replicated and extended by Brunstein and Schmitt (2004) and Brunstein and Maier (2005). Parallel findings have also been obtained for the domain of power motivation (Koestner,

Weinberger, & McClelland, 1991) and intimacy motivation (Craig, Koestner, & Zuroff, 1994). Furthermore, a meta-analysis by Spangler (1992) indicates that across studies, the predictive validity of PSE and self-report measures of achievement motivation depends on incentive type (task-intrinsic and social-extrinsic) and outcome measure (operant versus respondent). The direction of these effects was as predicted by the McClelland et al. (1989) model.

McClelland et al. (1989) also offered some speculative explanations as to why implicit and explicit motives respond to different types of incentives and influence different kinds of behavioral outcomes. They argued that implicit motives are shaped by ontogenetically early, prelinguistic, affectively toned learning experiences, whereas explicit motives are based on verbal learning of rules, demands, and expectations later in life. They also proposed that implicit motives are rooted in brain structures dedicated to automatic emotional processing whereas explicit motives are represented in cortical areas subserving explicit memory and the voluntary regulation of behavior.

While McClelland et al.'s (1989) dual-systems model of motivation represented a considerable step forward on the way toward a comprehensive model of implicit motives (and the explicit needs and goals that they need to be contrasted with), it lacked precise concepts and definitions and was therefore ill-suited for the derivation of testable hypotheses that went beyond an impressionistic understanding of how implicit motives operate. Schultheiss (2001) highlighted several problems and inconsistencies of the model. Chief among them is the lack of a clear-cut definition of what task-intrinsic incentives actually are. McClelland et al. (1989) stated that for individuals high in an implicit motive, "the primary incentive for carrying out the activity is the activity itself" (pp. 695 & 696); thus, the incentive is somehow embedded in the very behavior one wants to predict. If taken at face value, this framing of the term "task-intrinsic incentive" would lead to a circular conundrum:

"Why is Bob so good at this task?"

"Because it contains task-intrinsic incentives."

"How do you know that?"

"Because Bob performs this task so well."

However, for *n* Achievement, McClelland et al. (1989) identified some additional aspects of achievement tasks that made them attractive for high-achievement individuals, such as medium difficulty and task feedback. Obviously, such task characteristics can be measured and thus used to determine independently whether a task contains task-intrinsic incentives (see Spangler's 1992 coding of studies for achievement incentives). For *n* Power and *n* Affiliation, the nature of task-intrinsic incentives remained ill defined, though.

One reason for this is that McClelland et al.'s (1989) definition of social-extrinsic incentives as social rewards, prompts, expectations, and demands is problematic. The definition fits well with research on *n* Achievement, where a wealth of studies has shown that such incentives are good for activating explicit achievement concerns, but not for arousing implicit achievement motivation. Schultheiss (2001) pointed out that as soon as it is applied to other motives, the definition of social-extrinsic incentives runs into problems because social rewards such as smiles and laughter can be powerful incentives for the social motives *n* Power and *n* Affiliation, and they are not necessarily embedded in the activity that a person performs to reap such rewards.

The problems with the definition of task-intrinsic and social-extrinsic incentives become obvious when clear-cut research hypotheses need to be derived. For instance, Koestner et al. (1991) aimed to validate the McClelland et al. (1989) model by assessing implicit and explicit levels of power motivation in the prediction of behavior. Although they were able to independently conceptualize and manipulate social-extrinsic incentives and the assessment of

respondent behavior in the domain of explicit power motivation, they were unable to do so for implicit power motivation: Presentation of a pictorial social intelligence test served as a task-intrinsic incentive, and performance on it as a measure of operant behavior (see our previous discussion of the circularity issue), but the presence of task-intrinsic incentives was not manipulated. Even more strikingly, McClelland and colleagues sometimes used the very same instructions to arouse an implicit motive in one study and an explicit motive in another (see Schultheiss, 2001, for an example), which further underscores the lack of precision and hence usefulness of the incentive concepts presented by McClelland et al. (1989). As Schultheiss (2001) succinctly stated, "what cannot be pinpointed cannot be manipulated, either" (p. 5).

Yet another problem of the McClelland et al. (1989) model is the distinction between operant and respondent types of behavior. These terms date back to an earlier era in psychology when behaviorist concepts dominated research on learning and motivation. However, behaviorism has long been replaced by more sophisticated and complex models of learning and behavior (see, for instance, Mazur, 1998). Moreover, the way in which McClelland et al. (1989) defined and used the terms *operant* and *respondent* is ambiguous and does not dovetail easily with empirical findings. *Operant* referred to spontaneous behavioral trends, and McClelland (1980) even stated that the term characterizes behavior that occurs in the absence of clearly identifiable stimuli. But this contradicts earlier research that had documented reliable effects of tangible stimuli and situational features on motives, such as the facilitating effects of feedback, autonomy, and tasks of medium difficulty on the performance of achievement-motivated individuals (e.g., McClelland, 1987). Clearly, implicit motives do respond to identifiable stimuli, and this effect is manifested in behavior!

Conversely, in McClelland et al.'s (1989) model, *respondent* is reserved for immediate choice behaviors. But what, exactly, is an immediate choice? The preference of achievement-

motivated individuals for tasks of medium difficulty over low- or high-difficulty tasks, a classic validity criterion for implicit achievement motivation (Atkinson, 1957)? Or the choice between continuing on one task or switching to another, which is predicted by explicit achievement motivation (Brunstein & Maier, 2005)? McClelland (1980) was perhaps a bit clearer in his use of the term when he cited the process of filling out a personality questionnaire as an example for respondent behavior. So what he had in mind was choice behavior in which a person declares something to be true or not true with respect to her or his own sense of self. This is very different from, for instance, the split-second choices a car driver has to make to evade a sudden obstacle on the road. Thus, describing respondent behaviors as "choice behaviors" does not get one much further toward a robust, testable concept.

Still, the McClelland et al. (1989) model represented an important and heuristically fruitful advancement over earlier theories because it distinguished for the first time on two separate levels between the predictive motive construct, the incentive that activates a motive, and the behavior that is ultimately emitted or influenced by the Motive × Incentive interaction. The model thus acknowledged the existence of two separate ways to conceptualize human motivation, one in which humans have conscious values, beliefs, and goals that guide their actions and one in which humans are driven by unconscious needs that affect behavioral outcomes, and integrated them into one overarching framework. McClelland et al. (1989) also pointed out that the independent operation of two qualitatively different forms of motivation in humans may cause between-systems friction and psychological problems, a prediction that has received considerable attention by researchers in recent years.

Schultheiss's (2001, 2008) Two-Level Information-Processing Model of Motivation

Schultheiss (2001, 2008) presented a model that retained the two-level Motive × Incentive × Behavior framework of motivation as originally introduced by McClelland et al. (1989), but that defined the differences between incentives and behaviors on both levels of motivation more precisely and in better alignment with current concepts and findings from cognitive psychology and neuroscience. It also introduced a mechanism, referential processing, by which the implicit and explicit levels of motivation can dissociate or be brought into alignment.

Based on work by Paivio (1986, 1991) and other proponents of multiple-coding accounts of cognition, learning, and memory (e.g., Poldrack & Foerde, 2008; Squire, 2004), Schultheiss proposed that the crucial difference between incentives that implicit motives respond to and those that explicit motives respond to is that the former are perceived and represented nonverbally and the latter in a verbal-symbolic format. This hypothesis is supported by several lines of research. Klinger (1967) observed that individuals respond with increases in affiliation or achievement motivation expressed in the PSE to watching an affiliation-oriented or achievement-oriented experimenter, even when they could not hear his verbal instructions. Moreover, Schultheiss and Brunstein (1999, 2002) demonstrated that experimenters who assigned and described a power-related goal verbally to their participants failed to arouse participants' power motive. Only after participants had had an opportunity to translate the verbally assigned goal into an experiential format through a goal imagery exercise did their power motive predict goal commitment and task performance. Finally, as we will discuss in more detail below, facial expressions of emotion are particularly salient nonverbal cues for implicit motives. Facial signals of friendliness and hostility interact with individuals' implicit affiliation motive, and facial signals of dominance and submission interact with individuals' implicit power motive to shape attentional orienting and instrumental learning (Schultheiss & Hale, 2007; Schultheiss, Pang, et al., 2005).

The hypothesis that implicit motives respond preferentially to nonverbal incentives is also compatible with the previously mentioned finding that one and the same verbal instruction appears to arouse implicit motives in one study and explicit motives in another: In all likelihood, in the former case it was not the experimenter's verbal instructions that activated the implicit motive but rather, as Klinger's (1967) findings suggest, the experimenter's nonverbal demeanor and perhaps also paralinguistic factors such as tone and modulation of voice. Since nonverbal aspects of an experimenter's behavior were never seen as a potential source of motive arousal in work other than Klinger's (1967), researchers have never paid much attention to, controlled for, or reported them in the method sections of their papers. However, differences in experimenters' nonverbal behavior could be a key factor for explaining inconsistencies in findings obtained in past research on implicit motives.

According to Schultheiss (2001), explicit motives preferentially respond to verbally framed incentives such as instructions that highlight a task as an opportunity to achieve (e.g., "Students who perform well at this task also shine academically") or to affiliate (e.g., "For this task it is important that you get to know the other participants well and work together with them"). A study by Brunstein and Gollwitzer (1996, Study 1) illustrates this point. Participants with a strong explicit commitment to become a medical doctor were administered a judgment task that was presented as a sensitive indicator of their future success as a physician. Half of all participants were given negative feedback on this task, whereas the other half received no feedback. Afterwards, participants worked on an attention task that the experimenter either described as a completely unrelated task or as another indicator of participants' medical talents. This mere difference of words was sufficient to make participants who had been frustrated on the first task outperform all others (task related to medical ability) or perform worse than all others (unrelated task condition) on the second task.

Schultheiss (2001, 2008) also replaced McClelland et al.'s (1989) distinction between operant and respondent behavioral indicators of implicit and explicit motives with concepts that are more closely aligned with current theorizing and research on learning and memory (see also Schultheiss, 2007a). He argued that implicit motives preferentially predict *nondeclarative measures of motivation*, that is, behavior that represents the output of the brain's nondeclarative systems for regulating behavior (such as procedural learning, Pavlovian conditioning, emotional expression), including autonomous nervous system changes and hormone release (see Rolls, 1999; Squire, 2004). Explicit motives, in contrast, preferentially influence *declarative measures of motivation*, that is, the self-referenced judgments, decisions, preferences, and so forth, that people spontaneously state or declare when prompted. These are closely tied to the brain's systems for episodic and semantic memory, verbally based executive functions, and the left hemisphere's capacity to rationalize and interpret one's own and others' behavior (see Gazzaniga,1985; Luria & Homskaya, 1964; Rolls, 1999; Squire, 2004).

The declarative/nondeclarative distinction of criterion measures of explicit and implicit motives is consistent with and encompasses virtually all research using the respondent/operant distinction, including the studies we previously used to illustrate McClelland et al.'s (1989) model. But it goes beyond this distinction by allowing both types of behavioral correlates of implicit and explicit motives to be influenced by specifiable stimuli. Brain systems dedicated to nondeclarative forms of learning and behavior respond to, and can be tested with, clearly specifiable stimuli, although these typically have to be nonverbal. And brain systems dedicated to declarative forms of learning and behavioral regulation respond to other, typically verbal-symbolic classes of stimuli. By steering closer to current theory and research in cognitive psychology and the neurosciences, the declarative/nondeclarative distinction allows researchers to pinpoint the processes through which implicit motives influence behavior, the brain systems

involved, and the testing paradigms that are particularly suitable to detect motive effects on behavior.

For instance, Schultheiss, Wirth, et al. (2005) hypothesized that *n* Power should predict instrumental learning that is reinforced by social victory and defeat. A vast body of literature attests to the striatum's critical role in instrumental learning, and a well-established measure of striatal function in humans is Nissen and Bullemer's (1987) visuomotor learning task (Curran, 1998). This task requires participants to respond to complex, but repeating sequences of stars on different locations of the computer screen with a pattern of key presses mapped onto the stimulus locations. Because participants show improvements on the sequence that can be attributed to learning in the absence of an intention to learn and an awareness of the pattern inherent in the task, the Nissen and Bullemer task is also called a measure of *implicit* or *procedural learning* and fits squarely in the nondeclarative domain in Squire's (2004) taxonomy of learning and memory.

Schultheiss, Wirth, et al. (2005) had pairs of participants go through ten 1-min rounds on a visuomotor learning task and experimentally varied the outcome such that the winner won eight and the loser only two rounds. Implicit learning gains on the task were assessed after the contest was over. Among winners, individuals high in *n* Power had the largest implicit learning gains and individuals low in *n* Power had the smallest, suggesting that a victory over an opponent was positively reinforcing for high-power participants. Among losers, the pattern was reversed, with high-power individuals showing the smallest gains, suggesting that a defeat was particularly punishing for them.

Notably, *n* Power effects on implicit learning gains in this study and in a previous one (Schultheiss & Rohde, 2002) were mediated by parallel changes in the steroid hormone testosterone, another nondeclarative indicator of motivational processes. And perhaps equally

notably, *n* Power did not predict satisfaction with the contest outcome, which was assessed with a mood adjective list and thus represents a declarative measure of motivation.

The results of the Schultheiss, Wirth, et al. (2005) studies and those reported by Schultheiss and Rohde (2002) thus provide evidence that *n* Power influences procedural learning contingent on power-relevant incentives. Because procedural learning is closely tied to striatal function, these findings suggest that *n* Power (and perhaps other motives, too) recruits, and is represented in part by, the striatum, a critical structure for behavioral learning and incentive processing. Recent research using brain imaging supports this hypothesis: Relative to low-power individuals, high-power individuals show greater activation of anterior parts of the striatum in response to angry faces (Schultheiss et al., 2008; see also below).

This example illustrates the usefulness of the declarative/nondeclarative distinction and the cognitive neuroscience work it was derived from for modeling and testing the effects of implicit motives on behavior. They also show that using well-established measures and concepts from cognitive psychology and the neurosciences is heuristically extremely fruitful because they immediately link implicit motives to a rich nomological network of findings, correlates, and substrates associated with these measures. For instance, the link between *n* Power, implicit learning, and striatal function described above would suggest that the need for power is compromised when striatal function is impaired (as in Parkinson's or Huntington's disease; Kolb & Whishaw, 2003) or that the independence between implicit and explicit measures of power motivation may reflect, in part, the mutually inhibitory effects of striatal and neocortical control over behavior (Poldrack et al., 2001).

We acknowledge that under specific circumstances, the mapping of implicit motives onto nondeclarative measures and explicit motives onto declarative measures may not be mutually exclusive. For instance, explicit motivational functions such as verbally mediated self-regulatory

strategies may exert a transient influence on specific nondeclarative measures of motivation, such as performance speed, even in the absence of, or in conflict with, implicit motives. However, we would expect this top-down control of motivated behavior to differ from the bottom-up behavioral regulation exerted by motives by being more short-lived and to incur considerable costs in the form of self-regulatory depletions on subsequent tasks (see Muraven & Baumeister, 2000). Implicit motives, in contrast, should be characterized by longer-lasting and less defatigable effects on motivated performance. As another case in point, Woike (2008) has shown that implicit motives influence episodic memory, which according to Schultheiss's (2008) model would represent a declarative measure of motivation. However, Woike (2008) also points out that this effect of motives on episodic memory is only present for affectively charged episodes of daily lives, not for mundane, affectively cold events. Her research is thus consistent with neurobiological accounts of memory that demonstrate strong modulatory effects of the amygdala, a key structure for nondeclarative emotional processing, on the hippocampus, which is part of the declarative memory system supporting episodic memory (e.g., McGaugh, 2002). Clearly, further work is needed to carefully delineate under which specific circumstances implicit motives can influence declarative measures and explicit motives nondeclarative measures of motivation.

We finally turn to *referential processing* between verbal and nonverbal representations, the mechanism through which incentives processed by one motivational system can be translated into the representational format of the other. Work by Paivio (1986; Paivio, Clark, Digdon, & Bons, 1989) and Bucci (1984, 2002) illustrates how verbal representations can be translated into nonverbal representations (e.g., creating the mental image of a cow in response to the word cow) and vice versa (e.g., retrieving the proper verbal label for an object or a color). However, compared to processing information in its native format (i.e., linking words to other words or associating different nonverbal percepts and representations with each other), converting

information from one representational format into the other requires additional processing steps and thus extra time and effort. The ease and speed with which referential processing can occur depends on situational factors, that is, having the opportunity to devote one's cognitive resources to translating words into images and vice versa, as well as individual factors, that is, having the skills and cognitive resources to quickly move back and forth between nonverbal representations and verbal symbols (also termed *referential competence*).

Schultheiss (2001, 2008) hypothesized that heightened referential processing could facilitate the translation of verbal incentives into a nonverbal representation format that is accessible to implicit motives and, by the same token, aid the quick verbal representation of nonverbal affective responses triggered by implicit motives and thus promote conscious awareness of one's preferences and distastes. The previously mentioned studies by Schultheiss and Brunstein (1999, 2002) corroborate these assumptions: Individuals who had imagined a verbally assigned goal committed to and enacted the goal in congruence with their implicit motives, whereas goal commitment and enactment were independent of individuals' implicit motives in the absence of an opportunity to translate the verbal goal description into mental images. These findings have been replicated by Job and Brandstätter (in press).

Schultheiss, Liening, MacInnes, Patalakh, and Rawolle (2009) recently found evidence for an influence of individual differences in referential competence on the degree to which individuals' goal commitments match their implicit motives. Using a simple color-naming task adapted from Bucci (1984), Schultheiss et al. (2009) first assessed the latency difference between participants' reading of color words (e.g., "red," "blue," "green," "yellow") and naming of color patches (i.e., monochromatic squares in red, blue, green, etc). On average, participants took about 80 ms longer for naming color patches than for reading color words, a finding that is consistent with Paivio's (1986) prediction that referential processing across representational domains

involves more processing steps than within-domain processing. However, participants also had large interindividual differences in referential competence, with some showing virtually no slowing down on color naming whereas others named colors with an average delay of up to 200 ms relative to the reading of color words. These differences in referential competence were related to the level of congruence between individuals' goals and their implicit motives across the domains of power, achievement, and affiliation: Participants with high referential competence had significantly lower absolute z-score discrepancies between their commitment levels and their motive scores than participants with low referential competence. This finding is consistent with the notion that referential competence promotes congruence between the implicit and the explicit motivational systems. Still, further work is necessary to clearly establish that referential competence plays a causal role in the choice of motive-congruent goals or, more generally, the ability to consciously access and represent one's implicit motivational needs.

Summary

As our review of conceptual accounts of implicit motivation indicates, motivational theories in the McClelland-Atkinson tradition have from the very start been characterized by the idea that motivational processes may elude conscious introspection and therefore need to be assessed through means other than self-report (see also Murray, 1938). They have also been characterized by the fundamental tenet of motivation research: Behavior is the result of the interplay between a motivational need and a suitable incentive (Schultheiss, Kordik, Kullmann, Rawolle, & Rösch, 2009). Beyond these commonalities, each model has contributed valuable insights into the operation of implicit motives and therefore also into the ways that explicit motives are different from implicit motives. McClelland et al.'s (1953) affect-redintegration model introduced the idea that implicit motives are characterized by Pavlovian-conditioned associations between incentive cues and the affective change or outcome that they reliably

predict. McClelland et al.'s (1989) dual-systems model of motivation considerably extended earlier models of motivation by emphasizing that implicit and explicit motives respond to different kinds of incentives and influence different kinds of behavior. Schultheiss's (2001, 2008) information-processing model suggests that implicit motives process nonverbal types of incentives whereas explicit motives are tied to the verbal-symbolic representation of incentives, that nonverbal and verbal representations can be aligned through the process of referential processing, and that implicit motives shape nondeclarative behavior (including physiological changes) and explicit motives shape declarative behavior.

Taking the Nonverbal-Processing Hypothesis Further:

A Motivational Field Theory Model of Facial Expressions As Nonverbal Incentives

A central claim of Schultheiss's (2001, 2008) information-processing model of motivation is that implicit motives respond to specifiable nonverbal incentives. Recently, Schultheiss and colleagues have put this hypothesis to the test by exploring the role of facial expressions of emotion (FEE) as motivational incentives for the perceiver (Schultheiss & Hale, 2007; Schultheiss, Pang, et al., 2005; Schultheiss et al., 2008; Stanton et al., 2006; Wirth & Schultheiss, 2007).

FEEs are particularly good candidates for testing the nonverbal-processing hypothesis because the face is arguably the most significant and salient source of social information for humans, and emotional expressions that occur during social interactions between sender and perceiver carry information about the sender's intentions vis-à-vis the perceiver as well as the perceiver's effect on the sender (e.g., Argyle, 1975; Eibl-Eibesfeldt, 1995; Keltner & Haidt, 1999). FEEs are frequently classified and assessed with regard to their valence and arousal, that is, how pleasant or unpleasant or how arousing versus calming they appear to the perceiver (e.g., Johnsen, Thayer, & Hugdahl, 1995). We contend, however, that this view of FEEs and their

functions is too shortsighted and obscures more fundamental functions of FEEs. What is the point, for instance, of having just one pleasant FEE (joy), but several unpleasant ones (e.g., anger, disgust, fear, contempt, sadness)? And can the joy face really be an unambiguously positive stimulus when bared teeth are a primate's way of showing off his or her weapons (Eibl-Eibesfeldt, 1995)? Clearly, something more is going on than emotional expression for the sake of merely expressing one's pleasant and unpleasant emotions.

In recent years, conceptual and empirical work has started to examine the role of FEEs as devices for regulating people's interpersonal behavior. Keltner (Keltner, Ekman, Gonzaga, & Beer, 2003; Keltner & Haidt, 1999) has argued that specific FEEs in an interaction partner can act as rewards that people will work for or punishments that they will try to avoid. Knutson (1996) and Hess, Blairy, and Kleck (2000) showed that perceivers can readily judge FEEs with regard to how much they signal friendliness versus hostility and dominance versus submission. For instance, in both studies joy faces were judged to express dominance and friendliness alike, whereas anger was seen as a hostile dominance signal.

In the motivational field theory (MFT) of FEEs we present here, we extend on this line of work and integrate it with the interpersonal field approach to personality. The basic premise of interpersonal field theory is that people elicit and constrain each other's behavior (Wiggins & Trobst, 1999). Behavior is seen as intrinsically determined by the interdependent relationship between two people, never just as the effect of only one individual's personality. Interpersonal behavior can be described by two fundamental dimensions that are orthogonal to each other and form a circumplex (see Fig. 2): dominance (also variously called agency, power, mastery, or assertion) and affiliation (also called communion, love, intimacy). These dimensions entail different behavior-regulating principles. Dominance behavior is characterized by *complementarity*; that is, if one interactant asserts his or her dominance, this automatically forces

the other interactant into the submissive role. And vice versa: Taking a submissive stance toward another person puts that person in a dominant position. Affiliation behavior, in contrast, is characterized by the principle of *reciprocity*. The friendlier one interactant behaves, the friendlier the other will respond. Conversely, cold detachment and hostility in one person will elicit hostile behavior in the other.

In MFT, we add to these basic assumptions a motivational perspective, which owes a large debt to one of the pioneers of interpersonal field theory, Harry Stack Sullivan (1953). Specifically, we extend interpersonal field theory by three hypotheses that guide our theorizing and research on the role of FEEs as motivational incentives.

1. The Sender's Aroused Motivational Need Determines the Nonverbal Signal He or She Sends.

A person whose affiliation motive has been aroused is likely to send friendly affiliative signals, such as looking and smiling at the interaction partner. Likewise, a person high in *n* Power who perceives a dominance challenge may frown or look outright angry, speak in a loud voice, and perhaps close in on the challenger. However, which signal is sent depends not only on the sender's motive but also on the context in which the motive is aroused. For instance, high-affiliation individuals who are faced with the task of arguing against another's point of view—who essentially have to keep or increase their distance from another person—can also show a frown (Schultheiss, 1996). They are also known to become downright prickly and hostile if they perceive another person as being too dissimilar to themselves (Winter, 1996), a finding that is very much in line with the notion that hostile behavior represents the pole opposite of friendliness on the affiliation axis of interpersonal behavior. Thus, there is not necessarily a static one-to-one relationship between implicit motivational needs and specific nonverbal signals.

2. The Incentive Value of Nonverbal Signals for the Perceiver Depends on Their Location on the Dominance/Affiliation Circumplex.

In line with the complementary nature of behavior revolving around dominance, MFT predicts that a sender's dominance signal acts as a disincentive for the perceiver, forcing her or him to either passively adopt a submissive stance in the interaction or to actively fight against the sender's assertion of dominance. Conversely, a sender's signal of low dominance or submission is an incentive for the perceiver, allowing her or him to take a dominant position in the interaction. For the affiliation dimension, behavior is ruled by the principle of symmetry: friendly signals are incentives for the perceiver, whereas hostile signals are disincentives. Thus, MFT explains the behavioral patterns between interactants based on the motivational properties of signals sent on the dominance and the affiliation axis of interpersonal behavior.

3. The Incentive Value of Nonverbal Signals Depends on Perceivers' Implicit Motives.

The degree to which submissive and affiliative signals are positively reinforcing and dominant and hostile signals are aversive is not only a function of the signal itself, but also of the motivational needs of the perceiver. This position of MFT reflects Sullivan's (1953) early insight that one person's need satisfaction depends on the cooperation and complementary motivational states of another person. Thus, for a person who gets a kick out of being dominant herself or himself (i.e., a person high in *n* Power), another's dominance signal is much more aversive and another's submissive signal much more rewarding than for a person who doesn't care for dominance at all. Likewise, for a person who cherishes intimacy and close, friendly relations with others (i.e., a person high in *n* Affiliation), friendly nonverbal signals are more rewarding, and hostile signals more punishing, than for a person who lacks the capacity for finding pleasure in affiliative closeness.

It is readily apparent that these three predictions of MFT correspond to a basic *sender → signal → receiver* model of social communication that can be chopped up for research purposes into a *sender → signal* and a *signal → receiver* component. However, the model can also be tested as a whole using a Brunswickian lens model approach (see, for instance, Schultheiss & Brunstein, 2002). Moreover, by adding a recursive component, it can be used to study the complex back-and-forth in social interactions in which the receiver of a signal subsequently sends a signal that impinges on the former sender, who now becomes the receiver, which in turn elicits a response from her or him, etc., etc.

In the following, we will apply the *signal → receiver* component of MFT to the analysis of FEEs as motivational incentives. In so doing, we proceed on the assumption that FEEs can be located on the circumplex represented by the axes "dominance" and "affiliation," as has been suggested by Knutson's (1996) and Hess et al.'s (2000) work. Figure 2 provides an overview of the hypothesized positions of seven fundamental FEEs—joy, sadness, fear, surprise, disgust, anger, and neutral—on the circumplex. We will first discuss the conceptual and empirical reasons for placing each FEE on the circumplex and then review research that illustrates the interplay between perceivers' implicit motives and the incentive value inherent in FEEs.

Neutral Expression

Neutral expressions generally do not hold positive or negative incentive value for perceivers. They are not dominant or friendly, nor do they signal submission or hostility. They therefore represent meaningful control stimuli in experiments examining the effects of FEEs on the perceiver. One caveat is in order, however: Some research suggests that neutral expressions can be viewed as slightly negative (e.g., Lee, Kang, Park, Kim, & An, 2008). From the perspective of implicit motives, we would expect this to be particularly the case for power-motivated perceivers, whose overarching goal is to gain dominance by having impact on others.

A neutral expression directed at the perceiver signals that the perceiver has no impact on the sender, a state of affairs that should be unsatisfactory to the high-power individual.

Joy

Research participants rate joy faces as high on affiliation and dominance (Hess et al., 2000; Knutson, 1996). This suggests that the facial expression of joy represents a positive incentive for individuals high in *n* Affiliation, but a disincentive for individuals high in *n* Power. The latter prediction is also consistent with the hypothesis that baring one's teeth in a grin represents a display of weapons among primates. A lot may depend on context factors, however. For instance, a smile by a member of the opposite sex may be interpreted as less dominant and more affiliative than a smile displayed by a member of one's own sex, and thus by a potential competitor for attention from the other sex. The exact meaning of a smile may also depend on whether it is displayed with a lifted chin (= high-dominance signal; see Tracy & Robins, 2004) or as a "sheepish" smile indicating shame, with a slightly lowered head and gaze directed away from the observer (= low-dominance signal; see Keltner, 1995). In general, however, and other factors notwithstanding, expressions of joy have ambiguous incentive properties: positive from the perspective of the affiliation-motivated perceiver, negative from the perspective of the power-motivated perceiver.

Sadness

In placing the FEE of sadness on the circumplex, we follow the frequently made argument that sadness and crying represent appeals for help and thus for the restoration or utilization of close relationships with others (see Barr-Zisowitz, 2000, for a discussion of this issue). The sad face is therefore primarily a positive affiliation incentive. However, sadness also communicates that the sender is not in charge of her or his situation and perhaps even that the

person she or he is looking at may be the source of this deprivation of control. For this reason, the sad face also represents a slightly positive incentive for the power-motivated perceiver.

Fear

Fear directed at the perceiver is a highly ambiguous emotional signal. Many theorists interpret it as a communication of imminent danger (e.g., Öhman, 2002). But what is the source of the danger? Most emotion researchers use fear-face stimuli to invoke a state of fear in the observer, too, an effect that is plausible to the extent that FEEs tend to elicit similar FEEs in the perceiver and thus may make him or her experience the same emotion as the sender (Lakin & Chartrand, 2003). But that does not explain why the sender is looking at the perceiver in the first place. Part of it may be an appeal for help, similar to the sad face, only more intense and calling for immediate action. We think that this explanation has some plausibility, and we therefore place the fear face slightly on the positive incentive side of the affiliation dimension. However, we also think that a fear expression directed at the perceiver suggests to the perceiver *that the sender fears the perceiver*, that perhaps the moment before the perceiver has done something to profoundly intimidate the sender. This is a scenario that may happen relatively frequently in childhood, when a child learns that he can have power over other children by threatening them, but which can also occur in adolescence and even in adulthood, such as in situations of bullying or spousal abuse. For that reason, and also because fear is a defensive, withdrawal-oriented emotion, we place the fear FEE at the lower end of the dominance dimension, where it becomes a positive incentive for the power-motivated perceiver.

Surprise

Surprise is displayed when the surprisee's expectations have been violated (Camras et al., 2002). In the case of a social interaction, such a violation is likely to have been committed, either verbally or nonverbally, by the person to whom the sender directs the surprised expression. Thus,

surprise can reflect a power differential between sender's and perceiver's control over the interaction, with the surpriser having power over the surprised (cf. Conway, DiFazio, & Mayman, 1999). We therefore place the surprise expression at the low end of the dominance dimension. Because surprise communicates neither a clear appeal for succor to the sender, nor does it signal hostility, it is located on the neutral midpoint of the affiliation dimension.

Disgust

Although the most basic function of disgust is the withdrawal from, or expulsion of, contaminated substances (see, for instance, Berridge, 2000), in humans the disgust face represents a strong signal of moral or social rejection (Rozin, Haidt, & McCauley, 2000). We therefore categorize it as a clear affiliation disincentive and place it on the low end of the affiliation dimension. However, the open expression of rejection toward another person also signals the sender's superiority over the perceiver, whereas a lower-ranking person would tend to inhibit such expressions toward the perceiver (Conway et al., 1999; Tiedens, 2001). Thus, a side effect of expressing disgust toward another person is that the sender signals her or his dominance, which should make this expression a negative incentive for power-motivated perceivers.

Anger

Anger directed at the perceiver represents a threat to the perceiver and thereby also signals the sender's claim to dominance in the relationship. This function of the anger expression has been amply documented in humans and primates (Eibl-Eibesfeldt, 1995) and places anger at the high end of the dominance dimension. Anger also suggests a rejection of the perceiver, which makes this expression an affiliation disincentive. However, anger is more ambiguous in this regard than disgust, which signals outright rejection of the person this expression is directed at. Anger, in contrast, does not necessarily signify the final dissolution of a relationship; rather, it is a signal that the relationship is in trouble, and the outcome of the conflict can go either way:

reconciliation or repulsion. Therefore, anger is expected to be a moderately negative, but salient affiliation incentive.

Moderators of Signal → Perceiver Effects

Our overview of incentive effects of FEEs on the perceiver presents only a first approximation to the true state of affairs. As we have already pointed out, the *perceiver's motives* play a crucial role in whether an FEE can actually have motivational impact on her or him and whether the FEE acts as an incentive or disincentive. A perceiver low in power and affiliation motivation, for instance, will have no particularly strong response to a joy face, whereas a perceiver high in *n* Affiliation may feel attracted to it, a perceiver high in *n* Power may feel repelled by it, and a perceiver high in both motives may have conflicted feelings about it. Thus, we argue that *the incentive value of a face lies neither in the face nor in the perceiver alone, but rather in the interaction between the specific expression displayed in the sender's face and the motivational needs of the perceiver.*

Another critical moderator of an FEE's incentive value is, in people with heterosexual preferences, *the perceiver's gender vis-à-vis the sender's gender*, particularly from the perspective of intrasexual and intersexual competition (see Wilson, 1980). We suggest that perceivers should be particularly sensitive to the dominance dimension of FEEs displayed by a member of their own gender because dominance needs to be established within one's gender first if one wants to attract the attention of the other gender. Conversely, perceivers should be particularly sensitive to the affiliation dimension of FEEs signaled by a member of the other gender because FEEs high or low in affiliation incentive value reflect the likelihood of the perceiver getting closer to the opposite-sex sender. Of course, we expect these hypothesized gender effects to be compounded by the motivational needs of the perceiver: power-motivated individuals should be most sensitive to dominance signals of a same-sex sender, affiliation-

motivated individuals (particularly if they are high in intimacy motivation, the love dimension of the need to affiliate) should be most sensitive to affiliation signals of sender from the other sex.

A third critical moderator of signal → perceiver effects is *head orientation and/or gaze direction* (e.g., Adams & Kleck, 2005). A joy expression flashed at the perceiver has a very different meaning from a joy expression that the perceiver happens to observe but that is directed at someone else. In the former case, the affiliative and dominance-related meaning of joy is directly relevant for the perceiver's relationship with the sender; in the latter case, it is not. Accordingly, we would generally expect FEEs directed at someone else to represent weaker incentives than facial expressions directed at the perceiver.

Finally, the *strength of the emotional signal conveyed in an FEE* determines how a motivated perceiver will respond to it. Consider the case of anger. A full anger display—furrowed brow, glaring eyes, bared teeth—represents a clear-cut high-dominance and low-affiliation signal and, as we pointed out before, will be aversive for power- and affiliation-motivated perceivers. But what if the expression appears only fleetingly on the face (e.g., as a so-called microexpression; see Ekman & O'Sullivan, 1991) or in a much milder form, barely different from a neutral expression? Research suggests that eliciting low-level anger in others—teasing—may actually have positive incentive qualities for the perceiver (Keltner, Young, Heerey, Oemig, & Monarch, 1998), particularly if he or she has a strong need to dominate others. A study by Wirth and Schultheiss (2007) revealed that individuals high in testosterone, a hormonal marker of *n* Power (see Schultheiss, 2007b; Stanton & Schultheiss, in press), showed enhanced instrumental learning of behavior that was reinforced with 12 ms displays of anger faces. This effect did not occur when the anger faces were shown for longer durations. It is important to recall in this context that power-motivated individuals are characterized by a need to have emotional impact on others, a need that could in principle be satisfied by any FEE, as long

as it does not threaten the perceiver's need for dominance. Thus, a low-intensity or very short dominance display can actually have positive incentive qualities for the power-motivated perceiver because it does not represent an open dominance challenge as a full-fledged anger display would. It is noteworthy, too, that lower-ranking individuals typically restrain or inhibit their negative emotional displays toward a higher-ranking individual (e.g., Conway et al., 1999). For this reason, an inhibited anger expression, if detected and recognized as such, may represent a validation and reinforcement of the perceiver's own claim to dominance. This example illustrates that the incentive value of a given FEE for the perceiver's motivational needs can be related in a nonlinear fashion to the FEE's intensity.

Our discussion of moderators of *signal → perceiver* effects has highlighted what we consider the most critical factors that influence the interpretation of FEEs from a motivational point of view. It is not exhaustive. Other factors, such as sender attractiveness, or the age and ethnicity of sender and perceiver, are likely to influence the effect of FEEs on the perceiver, too, and therefore deserve to be explored conceptually and empirically in future work.

Empirical Findings in Support of MFT

Early evidence suggesting that emotions could be construed as motivational incentives emerged from the previously described study by Klinger (1967) and from another study by Atkinson and Walker (1958). In the already described study by Klinger (1967), nonverbal aspects of the experimenter's behavior by themselves were already fully effective at arousing participants' *n* Achievement and *n* Affiliation. However, the specific cues that elicited these effects (i.e., whether it was the experimenter's facial expression, body language, or a combination of both) were not studied. Atkinson and Walker (1958) reported that individuals with higher *n* Affiliation levels were more perceptually sensitive to facial stimuli, but not to neutral control stimuli (i.e., pictures of home furnishings). This study therefore provides the first specific clue

that, from the perspective of the implicit motivational needs of the perceiver, faces represent a special class of stimuli.

Several recent studies provide more specific corroborating evidence for MFT. Schultheiss, Pang, Torges, Wirth, and Treynor (2005) tested the incentive value of FEEs as a function of individuals' implicit motives, using an implicit learning task that measured the extent to which participants learned a behavior that was followed by an FEE. The FEE thus acted as an operant reward or punishment, depending on the person's implicit motives. Schultheiss and colleagues found that power-motivated individuals showed enhanced learning of visuomotor sequences that were followed by the low-dominance surprise expression and impaired by the high-dominance joy expression (see Fig. 3). In line with the hypothesized moderating effect of sender and perceiver gender, these effects emerged only for FEEs displayed by a same-sex sender. Anger faces, another high-dominance signal, led to general learning impairments in power-motivated participants, regardless of the match between perceivers' and senders' gender. Effects of *n* Affiliation on learning responses to FEEs were less pronounced. The hypothesized incentive effect of joy faces for affiliation-motivated individuals could not be detected, and anger (affiliation disincentive) had complex effects on affiliation-motivated participants' learning that were primarily due to impaired learning in response to neutral faces relative to emotional faces.

Schultheiss and Hale (2007) further explored motivational incentive effects of FEEs by measuring how much participants attended to FEEs. Using a dot-probe task to assess attentional orienting to emotional versus neutral faces presented for very short durations (between 12 and 231 ms), they found that individuals' motivational needs influenced how much attention they allocated to anger, joy and surprise expressions (see Fig. 4). Across two studies, power-motivated participants attended toward the low-dominance surprise expression, but away from the high-dominance anger and joy (Study 2 only) expressions. Affiliation-motivated individuals attended

toward angry faces, but were again indifferent to joy faces. One explanation for the lacking effects of joy faces on affiliation-motivated individuals in this study and the previously described study by Schultheiss et al. (2005) may be the use of a content coding system (Winter, 1994) that may have captured only the fear-of-rejection component of affiliation motivation, but not the hope-for closeness or love component, which presumably would make individuals more sensitive to positive affiliation incentives.

Stanton, Wirth, and Schultheiss (2006) extended research on the attention-grabbing effects of motivational incentives by demonstrating that Pavlovian-conditioned predictors of FEEs influence the allocation of attention similar to actual FEEs. They found that high-power individuals orient their attention away from conditioned stimuli (CS) that predicted the presentation of high-dominance FEEs (anger and joy faces). The incentive value of the FEE had been transferred to the CS, and the CS alone became sufficient to shape attentional orienting. Incidentally, this research also provided empirical support for McClelland et al.'s (1953) affect-redintegration model by demonstrating that implicit motives respond to conditioned cues that predict an affectively charged outcome.

Finally, in a study using functional magnetic resonance imaging, Schultheiss et al. (2008) tested effects of individuals' *n* Power, high-dominance anger faces, and low-dominance surprise faces on activation of brain areas involved in motivation and incentive processing. Relative to participants low in power motivation, power-motivated participants showed more activation of the anterior caudate, the insula, and the lateral orbitofrontal cortex in response to angry faces. They also had greater insula activation in response to surprised expressions.

Taken together, these studies provide encouraging support for the hypothesis that implicit motives respond to nonverbal incentives in general and specifically for the main tenet of MFT that the incentive value of facial expression is a joint function of the specific emotion displayed

and the motivational needs of the perceiver. Research findings are particularly strong for *n* Power, whereas results for *n* Affiliation are limited and only in partial agreement with the predictions of MFT. However, this may be due to the limited validity of the *n* Affiliation measure used in the studies reviewed above. Switching to a more suitable measure of the need to bond, such as McAdams's (1992) *n* Intimacy coding system, may yield findings more consistent with MFT in future research.

The Role of n *Achievement*

What about the role of *n* Achievement in the perception of FEEs? *n* Achievement represents a motivational dimension that is independent of *n* Power and *n* Affiliation and therefore cannot be readily fit into the same interpersonal field framework that these two motives, due to their profoundly social nature, naturally occupy. After all, *n* Achievement represents a need to do well on tasks, not with people. Nevertheless, it is interesting to note that the achievement motive has its origins in early childhood learning experiences that deal with the autonomous mastery of challenges and that are reinforced by parents' praise for successful mastery, and rejection and punishment for failing to master challenges (cf. McClelland & Pilon, 1983; Rosen & d'Andrade, 1959; Winterbottom, 1958). Thus, while the achievement motive may later be expressed in nonsocial life domains, its roots are social, and it therefore appears plausible that achievement-motivated individuals remain sensitive to social signals of emotion beyond the initial training that gave rise to their need to achieve.

Suggestive evidence in support of this conjecture comes from a reanalysis of data collected by Schultheiss and Hale (2007). When we scored participants' PSEs for *n* Achievement in Schultheiss and Hale's (2007) Study 2, we found that higher levels in this motive were associated with more attentional orienting toward joy faces ($r = .29$, $p < .05$). In an earlier pilot study on the effects of motives on attentional orienting to faces, Schultheiss and Hale

(unpublished data) found that individuals high in *n* Achievement oriented attention away from female faces showing anger ($r = -.38$, $p < .01$, $N = 61$) and that this effect was stronger for very short face presentation durations (12 ms, 23 ms) than for longer presentations (up to 370 ms). Evidence that high-achievement individuals may be sensitive to facial expressions also comes from a study by Riebel (2004; $N = 60$), who found that *n* Achievement predicted attentional orienting toward emotional (fear, sadness, disgust, contempt) faces presented for 12 ms ($r = .42$, $p < .001$), but attentional orienting away from such faces and toward neutral faces when they were presented for 231 ms ($r = -.28$, $p < .05$).

The specific significance of these findings is presently unclear because attentional orienting is not a straightforward measure of the rewarding and aversive qualities of a stimulus, only its overall motivational salience. Using instrumental-learning paradigms in future studies may provide more straightforward answers in this regard. Also, the difference between very short and longer FEE presentations for achievement-motivated perceivers is puzzling. Does it suggest that individuals high in *n* Achievement are highly sensitive to even the minutest of facial expressions, but tend to shut out others' emotions if they become too intense? And how exactly are these effects of FEEs on achievement-motivated perceivers related to their need to master challenging tasks on their own? Are the effects related to the early childhood socialization of achievement-motivated individuals? We think that these are intriguing questions that may provide important new impulses to research on *n* Achievement.

Future Directions

As we have indicated previously, our discussion of the implications of MFT and all supporting research so far have focused on the *signal → perceiver* portion of MFT. We have not touched on the role of motivation in the *sender → signal* path of the communication model

underlying MFT or the more complex predictions for dynamic interpersonal behavior that would result if the entire *sender → signal → perceiver* model were taken into account. After all, the signal a person perceives from a sender may be the harvest of what she or he sowed as the sender of another signal just the moment before. Although charting out these aspects of MFT in depth is beyond the scope of this chapter, their consideration in future research is likely to provide important insights into implicit motivation and the dynamics of interpersonal behavior.

For instance, we have already pointed out that power-motivated individuals are keen on having an emotional impact on others. But if showing an emotion is an acknowledgment of another's impact on oneself, how do power-motivated persons handle the display of their own emotions? We would predict that in general, they would try to show a "poker face" and be reluctant to show any emotion at all. If they cannot avoid expressing an emotion, then joy may be the FEE of choice because it signals relaxed, nonaggressive dominance and thus states a claim to other dominance seekers without necessarily eliciting a dominance struggle as the anger face would. Another advantage of the joy FEE is that it may serve to bring all affiliation-motivated perceivers on the side of the sender, an effect that could help power-motivated individuals rally support for their claim to dominance. Clearly, however, joy is also expressed by senders high in the need for affiliation, and in this case not for the sake of appearing dominant, but for making and keeping friends.

This example illustrates the complexities emerging from a motivational analysis of the factors that determine the presentation of an FEE. It also highlights the need to search for and pinpoint subtle differences in the presentation of FEEs (e.g., How does the joy expression displayed by a power-motivated sender differ from the joy expression displayed by an affiliation-motivated sender?) as well as the contexts in which individuals with specific motivational needs

typically display an FEE (e.g., In what kinds of social situations are power-motivated or affiliation-motivated individuals more likely to smile?).

Because MFT is a theory of the general role of emotional signals in motivation and interpersonal behavior, we think that it might also be fruitful to apply the principles and hypotheses we have sketched out here to other nonverbal communication channels. Clearly, power or affiliation is not only communicated by FEEs, but also by vocal characteristics, body language, and the dynamic interplay of different nonverbal channels (see, for instance, Schultheiss & Brunstein, 2002). We believe that the systematic exploration of these issues presents a rich, fascinating, and fruitful field for future research.

Conclusion

In this chapter, we have chronicled the history of incentive concepts in research on implicit motives, starting with the general mechanism of charging stimuli with incentive value (McClelland et al., 1953), moving on to dual-systems approaches (McClelland et al.., 1989), and all the way to the most recent (but likely not the last) conceptualization that emphasizes the nonverbal nature of implicit-motive incentives (Schultheiss, 2001, 2008). By presenting MFT, a spin-off of classic interpersonal field theories, we have also tried to illustrate how a careful analysis and conceptualization of motivational incentives can lead to clear-cut predictions about which stimuli should be rewarding or aversive for specific implicit motives and why. It is our hope that the arguments and hypotheses laid out in this chapter will help other researchers conduct rigorous and systematic research on implicit motives based on sound and testable principles and concepts. It turns out that implicit motivational incentives *can* be pinpointed, after all, and we believe that this insight is critical for further substantive advances in experimental research on implicit motives.

Adams, R. B., Jr., & Kleck, R. E. (2005). Effects of direct and averted gaze on the perception of facially communicated emotion. *Emotion, 5*(1), 3–11.

Argyle, M. (1975). Non-verbal communication in human social interaction. In R. A. Hinde (Ed.), *Non-verbal communication* (pp. 243–269). Cambridge, UK: Cambridge University Press.

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64,* 359–372.

Atkinson, J. W., & Walker, E. L. (1958). The affiliation motive and perceptual sensitivity to faces. In J. W. Atkinson (Ed.), *Motives in fantasy, action, and society: A method of assessment and study* (pp. 360–366). Princeton, NJ: Van Nostrand.

Barr-Zisowitz, C. (2000). "Sadness"—is there such a thing? In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 607–622). New York: Guilford.

Berridge, K. C. (2000). Measuring hedonic impact in animals and infants: Microstructure of affective taste reactivity patterns. *Neuroscience and Biobehavioral Reviews, 24*(2), 173–198.

Bindra, D. (1978). How adaptive behavior is produced: A perceptual-motivational alternative to response-reinforcement. *Behavioral and Brain Sciences, 1*, 41–91.

Brunstein, J. C., & Gollwitzer, P. M. (1996). Effects of failure on subsequent performance: The importance of self-defining goals. *Journal of Personality and Social Psychology, 70,* 395–407.

Brunstein, J. C., & Hoyer, S. (2002). Implizites und explizites Leistungsstreben: Befunde zur Unabhängigkeit zweier Motivationssysteme [Implicit versus explicit achievement strivings: Empirical evidence of the independence of two motivational systems]. *Zeitschrift fur Pädagogische Psychologie, 16,* 51–62.

Brunstein, J. C., & Maier, G. W. (2005). Implicit and self-attributed motives to achieve: Two separate but interacting needs. *Journal of Personality and Social Psychology, 89*(2), 205–222.

Brunstein, J. C., & Schmitt, C. H. (2004). Assessing individual differences in achievement motivation with the Implicit Association Test. *Journal of Research in Personality, 38*(6), 536–555.

Bucci, W. (1984). Linking words and things: Basic processes and individual variation. *Cognition, 17*, 137–153.

Bucci, W. (2002). The referential process, consciousness, and the sense of self. *Psychoanalytic Inquiry, 22*, 766–793.

Camras, L. A., Meng, Z., Ujiie, T., Dharamsi, S., Miyake, K., Oster, H., et al. (2002). Observing emotion in infants: Facial expression, body behavior, and rater judgments of responses to an expectancy-violating event. *Emotion, 2*(2), 179–193.

Conway, M., Di Fazio, R., & Mayman, S. (1999). Judging others' emotions as a function of the others' status. *Social Psychology Quarterly, 62*, 291–305.

Craig, J. A., Koestner, R., & Zuroff, D. C. (1994). Implicit and self-attributed intimacy motivation. *Journal of Social and Personal Relationships, 11*, 491–507.

Curran, T. (1998). Implicit sequence learning from a cognitive neuroscience perspective: What, how, and where? In M. A. Stadler & P. A. Frensch (Eds.), *Handbook of implicit learning* (pp. 365–399). Thousand Oaks, CA: Sage.

deCharms, R., Morrison, H. W., Reitman, W., & McClelland, D. C. (1955). Behavioral correlates of directly and indirectly measured achievement motivation. In D. C. McClelland (Ed.), *Studies in motivation* (pp. 414–423). New York: Appleton-Century-Crofts.

Eibl-Eibesfeldt, I. (1995). *Die Biologie des menschlichen Verhaltens: Grundriß der Humanethologie [The biology of human behavior: Principles of human ethology]* (3rd ed.). Munich, Germany: Piper.

Eisenberger, R. (1992). Learned industriousness. *Psychological Review, 99,* 248–267.

Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist, 46*, 913–920.

Entwisle, D. R. (1972). To dispel fantasies about fantasy-based measures of achievement motivation. *Psychological Bulletin, 77,* 377–391.

Gazzaniga, M. S. (1985). *The social brain: Discovering the networks of the mind*. New York: Basic Books.

Hess, U., Blairy, S., & Kleck, R. E. (2000). The influence of facial emotion displays, gender, and ethnicity on judgments of dominance and affiliation. *Journal of Nonverbal Behavior, 24,* 265–283.

Job, V., & Brandstätter, V. (in press). Get a taste of your goals: Promoting motive-goal congruence through affect-focus goal fantasy. *Journal of Personality*.

Johnsen, B. H., Thayer, J. F., & Hugdahl, K. (1995). Affective judgment of the Ekman faces: A dimensional approach. *Journal of Psychophysiology, 9,* 193–202.

Keltner, D. (1995). Signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. *Journal of Personality and Social Psychology, 68,* 441–454.

Keltner, D., Ekman, P., Gonzaga, G. C., & Beer, J. (2003). Facial expression of emotion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 433–456). New York: Oxford University Press.

Keltner, D., & Haidt, J. (1999). Social functions of emotions at four levels of analysis. *Cognition and Emotion, 13,* 505–521.

Keltner, D., Young, R. C., Heerey, E. A., Oemig, C., & Monarch, N. D. (1998). Teasing in hierarchical and intimate relations. *Journal of Personality and Social Psychology, 75*(5), 1231–1247.

Klinger, E. (1967). Modeling effects on achievement imagery. *Journal of Personality and Social Psychology, 7*, 49–62.

Knutson, B. (1996). Facial expressions of emotion influence interpersonal trait inferences. *Journal of Nonverbal Behavior, 20*, 165–182.

Koestner, R., Weinberger, J., & McClelland, D. C. (1991). Task-intrinsic and social-extrinsic sources of arousal for motives assessed in fantasy and self-report. *Journal of Personality, 59*, 57–82.

Kolb, B., & Whishaw, I. Q. (2003). *Fundamentals of human neuropsychology* (5th ed.). New York: Worth.

Lakin, J. L., & Chartrand, T. L. (2003). Using nonconscious behavioral mimicry to create affiliation and rapport. *Psychological Science, 14*(4), 334–339.

Lee, E., Kang, J. I., Park, I. H., Kim, J. J., & An, S. K. (2008). Is a neutral face really evaluated as being emotionally neutral? *Psychiatry Research, 157*(1–3), 77–85.

Lilienfeld, S. O., Wood, J. E., & Garb, H. N. (2000). The scientific status of projective techniques. *Psychological Science in the Public Interest, 1*, 27–66.

Luria, A. R., & Homskaya, E. D. (1964). Disturbances in the regulative role of speech with frontal lobe lesions. In J. M. Warren & K. Akert (Eds.), *The frontal grabular cortex and behavior* (pp. 353–371). New York: McGraw-Hill.

Mazur, J. E. (1998). *Learning and behavior* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

McAdams, D. P. (1992). The intimacy motive. In C. P. Smith (Ed.), *Motivation and personality: Handbook of thematic content analysis* (pp. 224–228). New York: Cambridge University Press.

McClelland, D. C. (1980). Motive dispositions. The merits of operant and respondent measures. In L. Wheeler (Ed.), *Review of personality and social psychology* (Vol. 1, pp. 10–41). Beverly Hills, CA: Sage.

McClelland, D. C. (1987). *Human motivation*. New York: Cambridge University Press.

McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.

McClelland, D. C., Koestner, R., & Weinberger, J. (1989). How do self-attributed and implicit motives differ? *Psychological Review, 96*, 690–702.

McClelland, D. C., & Pilon, D. A. (1983). Sources of adult motives in patterns of parent behavior in early childhood. *Journal of Personality and Social Psychology, 44*, 564–574.

McGaugh, J. L. (2002). Memory consolidation and the amygdala: A systems perspective. *Trends in Neurosciences, 25*(9), 456.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247–259.

Murray, H. A. (1938). *Explorations in personality*. New York: Oxford University Press.

Nissen, M. J., & Bullemer, P. (1987). Attentional requirements of learning: Evidence from performance measures. *Cognitive Psychology, 19*, 1–32.

Öhman, A. (2002). Automaticity and the amygdala: Nonconscious responses to emotional faces. *Current Directions in Psychological Science, 11*, 62–66.

Paivio, A. (1986). *Mental representations. A dual coding approach*. New York: Oxford University Press.

Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology, 45*, 255–287.

Paivio, A., Clark, J. M., Digdon, N., & Bons, T. (1989). Referential processing: Reciprocity and correlates of naming and imaging. *Memory & Cognition, 17*(2), 163–174.

Poldrack, R. A., Clark, J., Pare-Blagoev, E. J., Shohamy, D., Creso Moyano, J., Myers, C., et al. (2001). Interactive memory systems in the human brain. *Nature, 414*(6863), 546–550.

Poldrack, R. A., & Foerde, K. (2008). Category learning and the memory systems debate. *Neuroscience and Biobehavioral Reviews, 32*(2), 197–205.

Riebel, K. (2004). *Implicit motives modulate attentional orienting to facial expressions of fear, disgust, contempt, and sadness*. Unpublished diploma thesis: Johannes-Gutenberg University, Mainz, Germany.

Rolls, E. T. (1999). *The brain and emotion*. Oxford, UK: Oxford University Press.

Rosen, B. C., & D'Andrade, R. (1959). The psychological origins of the achievement motive. *Sociometry, 22*, 185–218.

Rozin, P., Haidt, J., & McCauley, C. R. (2000). Disgust. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 637–653). New York: Guilford.

Schacter, D. L. (1987). Implicit memory: History and current status. *Journal of Experimental Psychology Learning, Memory, and Cognition, 13*, 501–518.

Schultheiss, O. C. (2001). An information processing account of implicit motive arousal. In M. L. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement. Vol. 12: New directions in measures and methods* (pp. 1–41). Greenwich, CT: JAI Press.

Schultheiss, O. C. (2007a). A memory-systems approach to the classification of personality tests: Comment on Meyer and Kurtz (2006). *Journal of Personality Assessment, 89*(2), 197–201.

Schultheiss, O. C. (2007b). A biobehavioral model of implicit power motivation arousal, reward and frustration. In E. Harmon-Jones & P. Winkielman (Eds.), *Social neuroscience: Integrating biological and psychological explanations of social behavior* (pp. 176–196). New York: Guilford.

Schultheiss, O. C. (2008). Implicit motives. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 603–633). New York: Guilford.

Schultheiss, O. C., & Brunstein, J. C. (1999). Goal imagery: Bridging the gap between implicit motives and explicit goals. *Journal of Personality, 67,* 1–38.

Schultheiss, O. C., & Brunstein, J. C. (2002). Inhibited power motivation and persuasive communication: A lens model analysis. *Journal of Personality, 70,* 553–582.

Schultheiss, O. C., & Brunstein, J. C. (2005). An implicit motive perspective on competence. In A. J. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 31–51). New York: Guilford.

Schultheiss, O. C., & Hale, J. A. (2007). Implicit motives modulate attentional orienting to perceived facial expressions of emotion. *Motivation and Emotion, 31*(1), 13–24.

Schultheiss, O. C., Kordik, A., Kullmann, J. S., Rawolle, M., & Rösch, A. G. (2009). Motivation as a natural linchpin between person and situation. *Journal of Research in Personality, 43,* 268-269.

Schultheiss, O. C., Liening, S., MacInnes, J. J., Patalakh, M., & Rawolle, M. (2009). *Referential competence predicts congruence between implicit motives and explicit goals*. Manuscript in preparation, Friedrich-Alexander University, Erlangen, Germany.

Schultheiss, O. C., Pang, J. S., Torges, C. M., Wirth, M. M., & Treynor, W. (2005). Perceived facial expressions of emotion as motivational incentives: Evidence from a differential implicit learning paradigm. *Emotion, 5*(1), 41–54.

Schultheiss, O. C., & Rohde, W. (2002). Implicit power motivation predicts men's testosterone changes and implicit learning in a contest situation. *Hormones and Behavior, 41*, 195–202.

Schultheiss, O. C., Wirth, M. M., Torges, C. M., Pang, J. S., Villacorta, M. A., & Welsh, K. M. (2005). Effects of implicit power motivation on men's and women's implicit learning and testosterone changes after social victory or defeat. *Journal of Personality and Social Psychology*, *88*(1), 174 188.

Schultheiss, O. C., Wirth, M. M., Waugh, C. E., Stanton, S. J., Meier, E., & Reuter-Lorenz, P. (2008). Exploring the motivational brain: Effects of implicit power motivation on brain activation in response to facial expressions of emotion. *Social Cognitive and Affective Neuroscience, 3*, 333–343.

Spangler, W. D. (1992). Validity of questionnaire and TAT measures of need for achievement: Two meta-analyses. *Psychological Bulletin, 112*, 140–154.

Squire, L. R. (2004). Memory systems of the brain: A brief history and current perspective. *Neurobiology of Learning and Memory, 82*(3), 171–177.

Stanton, S. J., & Schultheiss, O. C. (in press). The hormonal correlates of implicit power motivation. *Journal of Research in Personality*.

Stanton, S. J., Wirth, M. M., & Schultheiss, O. C. (2006, January). *Effects of perceivers' implicit power motivation on attentional orienting to Pavlovian-conditioned cues of anger and joy.* Paper presented at the Society for Personality and Social Psychology, Palm Springs, CA.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: Norton.

Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: The effect of negative emotion expressions on social status conferral. *Journal of Personality and Social Psychology, 80,* 86–94.

Toates, F. (1986). *Motivational systems*. Cambridge, UK: Cambridge University Press.

Tracy, J. L., & Robins, R. W. (2004). Show your pride: Evidence for a discrete emotion expression. *Psychological Science, 15,* 194–197.

Weinberger, J., & McClelland, D. C. (1990). Cognitive versus traditional motivational models: Irreconcilable or complementary? In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 562–597). New York: Guilford Press.

Wiggins, J. S., & Trobst, K. K. (1999). The fields of interpersonal behavior. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 653–670). New York: Guilford.

Wilson, E. O. (1980). *Sociobiology: The abridged edition*. Cambridge, MA: Belknap/Harvard.

Winter, D. G. (1994). *Manual for scoring motive imagery in running text* (4 ed.). Department of Psychology, University of Michigan, Ann Arbor: Unpublished manuscript.

Winter, D. G. (1996). *Personality: Analysis and interpretation of lives*. New York: McGraw-Hill.

Winterbottom, M. R. (1958). The relation of need for achievement to learning experiences in independence and mastery. In J. W. Atkinson (Ed.), *Motives in fantasy, action, and society: A method of assessment and study* (pp. 453–478). Princeton, NJ: Van Nostrand.

Wirth, M. M., & Schultheiss, O. C. (2007). Basal testosterone moderates responses to anger faces in humans. *Physiology and Behavior, 90*(2–3), 496–505.

Woike, B. A. (2008). A functional framework for the influence of implicit and explicit motives on autobiographical memory. *Personality and Social Psychology Review, 12*(2), 99–117.

Author Notes

We thank Andreas G. Rösch for comments and suggestions on an earlier version of this chapter.

Parts of the research summarized in this chapter were supported by Deutsche Forschungsmeinschaft grants SCHU 1210/1_2, 1-3, and 2-2, NIMH grant 1 R03 MH63069-01, NSF grant BCS 0444301, and a Rackham Predoctoral Fellowship.

Figure Captions

Figure 1. Information-processing model of implicit and explicit motivation (solid lines: significant correlation/influence; dashed lines: no significant correlation/influence). Adapted with permission from Schultheiss, O. C. (2008). Implicit motives. In O. P. John, R. W. Robins & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (3 ed., pp. 603-633). New York: Guilford.

Figure 2. Motivational field theory circumplex model of the incentive value of nonverbal signals of emotion. Expressions of anger, disgust, and joy signal high dominance and expressions of surprise, fear, and sadness signal low dominance. Expressions of anger and disgust signal low affiliation and expressions of joy, sadness, and fear signal high affiliation. The extent to which these expressions then represent a positive or a negative incentive depends on the perceiver's needs for power and affiliation.

Figure 3. Effects of facial expressions as reinforcers in a differential implicit learning task during extinction. Solid lines: sequences were reinforced with emotional face; striped lines: sequences were reinforced with neutral face; dotted lines: sequences were not reinforced with face stimuli. Adapted with permission from Schultheiss, O. C., Pang, J. S., Torges, C. M., Wirth, M. M., & Treynor, W. (2005). Perceived facial expressions of emotion as motivational incentives: Evidence from a differential implicit learning paradigm. *Emotion, 5*(1), 41-54.

Figure 4. Effects of facial expressions and implicit motives on attentional orienting in a dot-probe task. Positive bias scores: attentional orienting towards emotional face; negative scores: attentional orienting towards neutral face. Illustration of data reported by Schultheiss & Hale (2007, Study 2).

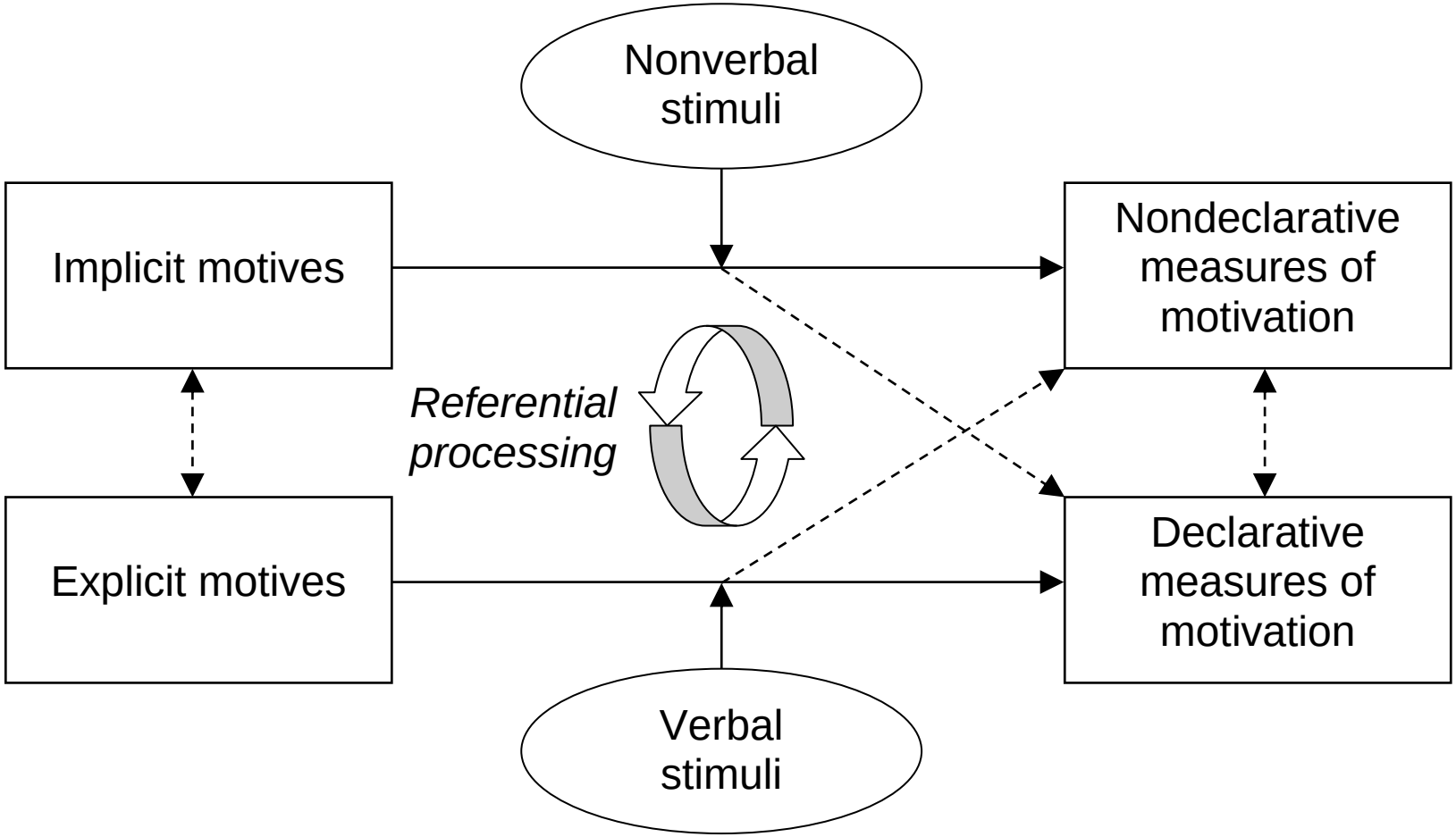
Nonverbal stimuli
Implicit motives
Nondeclarative measures of motivation
Referential processing
Explicit motives
Declarative measures of motivation
Verbal stimuli

Figure 1

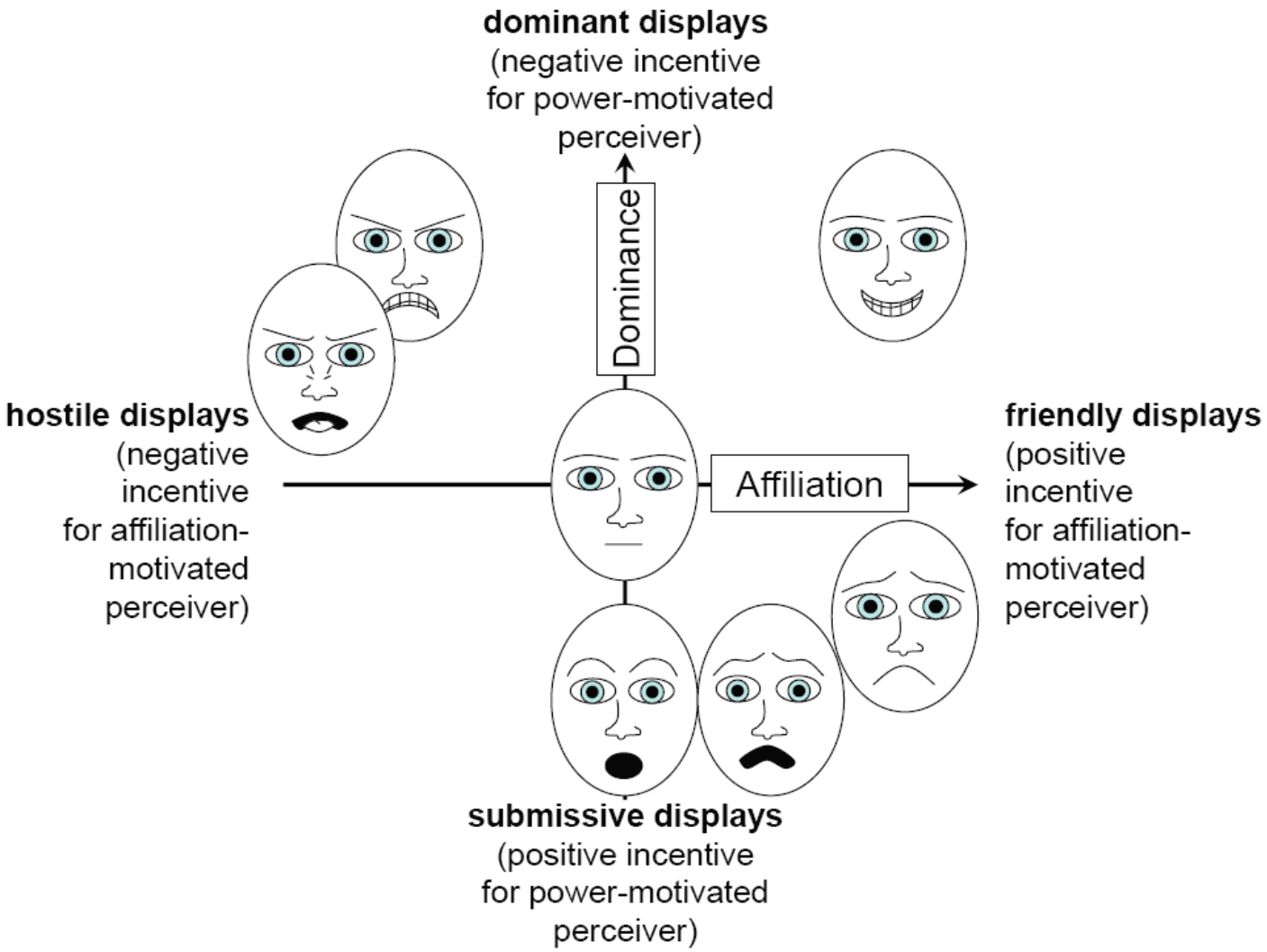
dominant displays
(negative incentive
for power-motivated
perceiver)
Dominance
hostile displays
(negative
incentive
for affiliation-
motivated
perceiver)
Affiliation
friendly displays
(positive
incentive
for affiliation-
motivated
perceiver)
submissive displays
(positive incentive
for power-motivated
perceiver)

Figure 2

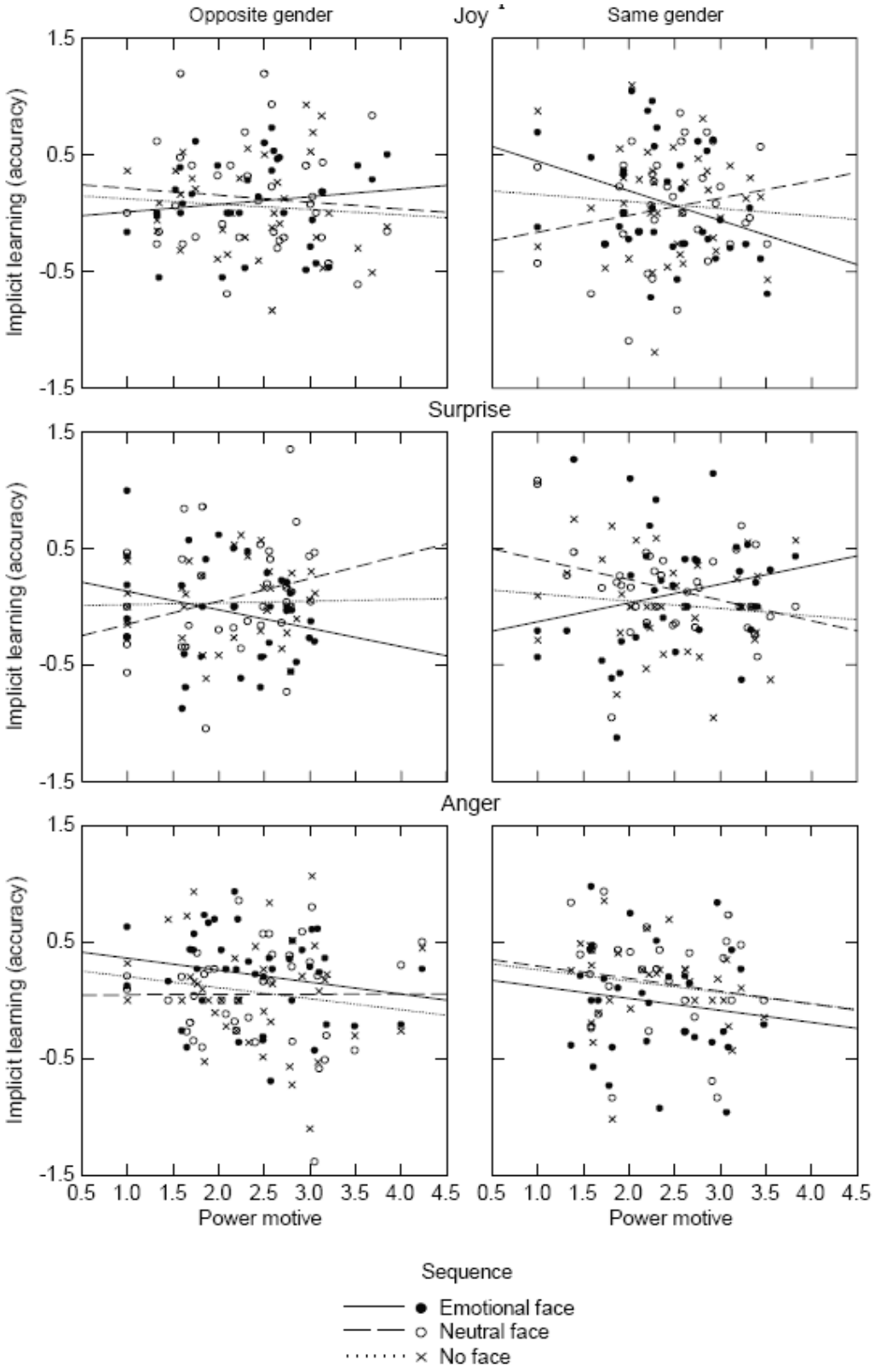
Opposite gender
Joy
Same gender
Surprise
Anger
Implicit learning (accuracy)
1.5
0.5
-0.5
-1.5
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5
Power motive
Sequence
Emotional face
Neutral face
No face

Figure 3

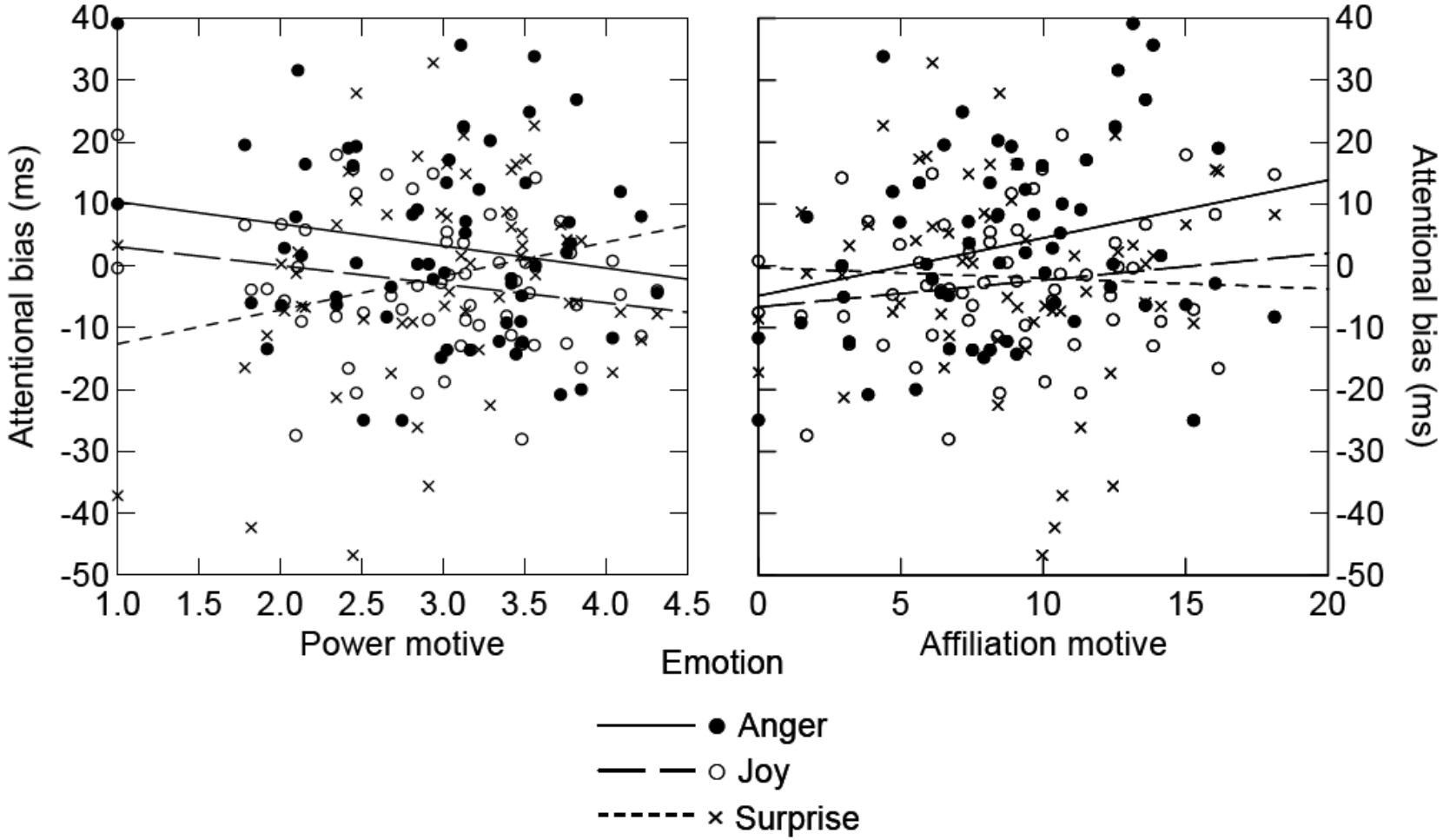
Attentional bias (ms)
40
30
20
10
0
-10
-20
-30
-40
-50
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Power motive
0
5
10
15
20
Affiliation motive
Attentional bias (ms)
Emotion
Anger
Joy
Surprise

Figure 4