An information processing account of implicit motive arousal[1]

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When McClelland, Atkinson, Clark and Lowell published their groundbreaking monograph "The achievement motive" in 1953, scientific research on human motives such as the needs for achievement, affiliation, or power was off to a great start as a respectable, promising and flourishing branch of psychology. It generated thousands of published research reports over the next three decades and spilled over into other disciplines such as political science, economics, history, or sociology. Roughly at the beginning of the 1980s, however, the former stream of research output had dwindled down to a trickle, and this development was foreshadowed by earlier reviews critical both of the construct validity of motives and their mode of measurement (e.g., Entwisle, 1972; Fineman, 1977; Klinger, 1966). Criticisms of the Thematic Apperception Test (TAT) and its variants as being unreliable motive measures turned out to be largely unfounded and based on methodological artifacts (e.g., Lundy, 1985; Winter & Stewart, 1977; see also Kuhl, 1978) as well as the inappropriate application of classical test theory to motivational phenomena (Atkinson, 1981; Atkinson & Birch, 1970; Cramer, 1999; McClelland, 1980) and will not be further reviewed here. Criticisms leveled at the validity of the motive construct in the McClelland-Atkinson tradition, however, may be more difficult to counter and, to the extent that they reflect the frustrations of many researchers who failed to find meaningful relationships between motives and behavior in their studies, may have contributed substantially to the demise of motive research.

For instance, Klinger (1966) noted in a review of studies focusing on achievement motivation that while roughly half of the then published studies obtained significant and meaningful relationships between the achievement motive and performance measures, the other half failed to obtain such relationships. This state of affairs led Klinger to question whether TAT-based achievement motive measures actually measure anything motivational at all. Lazarus (1961) summarized research showing either no or paradoxical relationships between the achievement motive and behavior. Taking an essentially Freudian stance, he concluded that the achievement motive is expressed in primary process-like fantasy (i.e., in TAT stories) only to the extent that it is blocked from behavioral manifestations or not filtered away by ego defenses when it is too strongly aroused. According to this point of view,

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[1]From: 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.

one should not expect to be able to predict performance and behavior from a TAT measure of the achievement motives (or any other motive) in any direct and straightforward way.

In the present chapter, I will argue that, contrary to the views of Klinger and Lazarus, motives do have a direct, motivating effect on behavior, and that this effect depends on the type of incentive present in a given situation. My main claim will be that motives are aroused by and respond to directly perceived and experienced incentives rather than to verbal-symbolic incentives. I will also argue that failure to present incentives in an experiential format or lack of control for features of the testing situation that cue motives experientially will produce the nonsignificant or sometimes even paradoxical effects cited by Klinger and Lazarus. In support of these claims, I will present an information-processing framework to account for the effects of incentives and motives on behavior, report findings from four experimental studies that support this model and illustrate a technique through which motives can be reliably aroused in experimental laboratory research, and conclude with some thoughts on the interplay between motivational systems in humans. To set the stage for these ideas, however, it might be informative to first take a look at what motives are and how previous researchers have (mis-)conceived the characteristics of motive-arousing incentives.

Previous views of motive-arousing incentives

Motives like the needs for achievement, power or affiliation are inherently affect-driven: they aim at gaining pleasure from the consummation of a motive-specific incentive (McClelland, 1987). In the case of the achievement motive, the incentive is doing something better or improving on a task; in the case of the power motive, it is having impact on other people or the world at large; and in the case of the affiliation motive, it is having close, friendly contact with others. Motives are aroused by situational cues that predict the availability of a motive-specific-incentive in a given situation and subsequently recruit and fuel behavior aimed at attaining the incentive. As individual-difference variables, motives indicate to what extent a person can become motivated by such cues and eventually gain pleasure from making contact with an incentive. For instance, a person with a strong power motive will experience having impact on somebody as more rewarding and desirable than a person with a weak power motive. This affect-amplifying function of implicit motives was recently documented by Brunstein, Schultheiss and Grässmann (1998), who found that individuals high in an implicit motive reported a greater sense of satisfaction after attaining a motive-specific incentive than individuals low in the same motive. According to McClelland (1987), individuals high in a motive will consequently strive more frequently or more intensely for a motive-specific incentive than individuals low in the same motive.

In the McClelland-Atkinson tradition, the needs for achievement, power and affiliation have also been termed implicit motives because they operate outside of a person's conscious awareness and cannot be validly assessed with self-report measures designed to tap these motivational domains (cf. McClelland, Koestner, & Weinberger, 1989). However, they are assumed to influence imagined and real behavior after being aroused by motive-relevant situational cues. Therefore, the strength of an individual's motive can be determined by analyzing the content of fantasies she or he reports in response to motive-relevant picture cues, as used in the TAT and similar measures.

However, despite over 50 years of research on implicit motives, the exact nature of motive-arousing cues is still not understood very well. McClelland et al's (1953; see also McClelland, 1958) original theory of motive-arousing stimuli was couched in the language of Pavlovian conditioning and stated that initially neutral stimuli that reliably predict a positive (or negative) affective end state will become conditioned stimuli that can evoke approach (or avoidance) motivation related to these end states. No further attempt was made to pinpoint what types of stimuli might or might not be suitable for such conditioning to occur and hence to arouse a motive.

McClelland (1980) essentially abandoned the 1953 model by using Skinnerian language and stating that motives influence operant behavior, that is, behavior that is spontaneously emitted and occurs in the absence of identifiable eliciting stimuli. He contrasted motives with the values individuals consciously endorse and which influence respondent behavior, that is, behavior in response to an identifiable eliciting stimulus. McClelland also proposed that the TAT is an operant measure of implicit motives: "I favor referring to these [TAT] thought samples as operant because in Skinner's sense it is not possible to identify the exact stimulus that elicits them. [...] the stimulus is vague [...]" (p. 12). Conversely, he considered the questionnaires typically used to assess how much value individuals place on achievement, power, or affiliation to be respondent measures because they present the testee with a specifiable stimulus (e.g., a self-descriptive item) and also specify the response mode (e.g., "agree" or "disagree").

These conclusions are in direct contradiction to the majority of theorizing and research on implicit motives. First, at the level of the terms used by McClelland (1980), the 1953 model of motive arousal would be that of a respondent rather than an operant process, since it explicitly takes motive-arousing stimuli into account. Second, McClelland and other motive researchers did not just use any TAT picture cues to collect stories from their subjects (as could be suspected on the basis of McClelland's assertion that it is impossible to determine which stimulus influences a story's content). From the outset, investigators employed pictures that were tailored to the assessment of the particular motive they were interested in measuring. For instance, in their pioneering work on the hunger motive, Atkinson and McClelland (1948) used pictures suggesting satiation, food deprivation, invitation to eat, place of eating, or food to elicit stories from food-deprived and non-deprived participants. McClelland et al (1953) employed pictures showing people in various achievement-related situations (e.g., two men in a shop working at a machine; a boy sitting at a desk with an open book in front of him) to assess their participants' achievement motive. Moreover, these researchers carefully analyzed the "pull" different pictures had for eliciting achievement imagery and found significant and reliable differences between pictures. Similar picture cue effects on motive imagery have recently been reported by Schultheiss and Brunstein (in press a) for the needs for power, achievement, and affilition. Thus, the TAT can hardly be termed an "operant measure" in the sense that it does not contain identifiable stimuli whose effects on subjects' fantasies can be measured reliably. Third and finally, researchers have relied heavily on their ability to control motive-arousing stimuli in experimental research on implicit motives. Again, two studies from McClelland et al's (1953) influential monograph on the achievement motive can serve as a case in point. These researchers experimentally varied participants' achievement arousal by providing no feedback, failure feedback, success feedback or success/failure feedback on a series of performance tests and then administered a TAT. They

found that participants' TAT achievement motive scores varied systematically as a function of the experimental condition – a clearcut demonstration of stimulus effects on achievement motivation. In another study, participants worked on a number of tasks under neutral, task-oriented, or achievement-oriented instructions and were then interrupted before they had completed the tasks. Individuals with a strong achievement motive in the achievement-oriented condition, relative to those in the neutral or task-oriented condition, subsequently remembered more uncompleted tasks than individuals with a weak achievement motive. These results then, too, document that a motive's influence on behavior depends on the presence of identifiable motive-arousing stimuli and that researchers, including McClelland himself, have made strategic use of such stimuli in their research.

Overall, then, McClelland's (1980) distinction between "operant" motives and "respondent" values seems to be an inaccurate and misleading one in that it suggests that motive-arousing stimuli can not be identified or may not even exist. Implicit motives clearly respond differentially to specific stimuli, be they TAT picture cues or experimental conditions and instructions; if this were not the case, research on implicit motives would have been impossible from the outset.

McClelland, Koestner and Weinberger (1989; see also Koestner, Weinberger & McClelland, 1991) made another attempt to come to grips with the nature of motive-arousing stimuli by discriminating between explicit, social-extrinsic and implicit, task-intrinsic stimuli. They argued that implicit motives respond to incentives that are inherent in performing a task or an activity whereas consciously endorsed values – now called explicit or self-attributed motives – respond to explicit social expectations, demands, rewards or prompts. Although this distinction has had some heuristic value for subsequent research on the separate and conjoint effects of implicit and explicit motives on behavior (e.g., Biernat, 1989; Brunstein & Hoyer, in press; Koestner et al., 1991), it is not without problems. First and foremost, while it clearly predicts that explicit task instructions will activate a person's self-attributed motives (e.g., the instruction "It is important that you work hard and excel at this task" should trigger a person's explicit achievement motive), it fails to identify what the "inherent" activity features are that supposedly engage a person's implicit motives. Since what cannot be pinpointed cannot be manipulated, either, it comes as little surprise that in a set of experiments which Koestner et al. (1991) conducted in order to support the social-extrinsic/task-intrinsic distinction, only the presence or absence of social-extrinsic incentives was varied experimentally, but not the presence or absence of task-intrinsic incentives.

Furthermore, placing motive arousal or satisfaction into the performance of an activity itself while excluding the social context of the activity may represent an adequate description of how the relatively non-social achievement motive, which is mainly about doing well or improving on a task, works. But in all likelihood this definition falls short in capturing the essence of stimuli to which the socially oriented needs for power or affiliation respond. For these motives, crucial stimuli are those that indicate whether one has had impact on others (power) or has established rapport with others (affiliation) and the activities leading to these outcomes may not necessarily be intrinsically motive-arousing or -rewarding by themselves, but rather follow the laws of means-end instrumentality (cf. Schultheiss & Brunstein, in press b).

The Koestner et al. (1991) studies also highlight another problem with the social-extrinsic/task-intrinsic

distinction, namely, that the same type of instructions that are used here as a social-extrinsic incentive to activate participants' self-attributed motives have been and continue to be employed to arouse participants' implicit motives in other studies. Compare the "social-extrinsic" instructions used by Koestner et al. (1991) in Experiment 1 to engage participants' explicit achievement motive (top) with those used by McClelland (1995) to arouse participants' implicit achievement motive (bottom):

> "People seem to remember words related to their personalities best. [...] People interested in achievement are better at remembering how hard people are working or how well they are doing on various tasks." (Koestner et al, 1991, p. 67; italics in original)
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> "Let's see how many [arithmetic problems] you can do in five minutes. Work as hard and correctly as you can. Do your very best. I want to see who can do the most problems in five minutes." (McClelland, 1995; p. 64)

In both studies, the effects of these instructions were compared to the effects of neutral instructions in a control group. In both studies, the interaction effect of arousal instructions with motivational dispositions on performance on a memory task was assessed. In the Koestner et al (1991) study, higher levels of self-attributed achievement motivation, but not of implicit achievement motivation, predicted better recall performance in the arousal condition. Conversely, in the McClelland (1995) study, higher levels of implicit achievement motivation, but not of explicit achievement motivation, predicted better recall performance in the arousal condition. It is hard to see in what sense McClelland's (1995) arousal instructions are any less social-extrinsic or more task-intrinsic than Koestner et al's (1991) arousal instructions. At the same time, the result patterns from these studies are completely at odds with each other. This suggests either that McClelland and colleagues' social-extrinsic/task-intrinsic distinction is not a valid or accurate way to conceive of motivational arousal processes, or that other, unidentified factors account for the differences in findings from these studies, or both.

This conclusion is also supported by the paradoxical motive-behavior relationships first pointed out by Lazarus (1961). Corroborating Lazarus's observation, Spangler (1992) found in a meta-analysis of the validity of implicit and explicit achievement motive measures that in the presence of social-extrinsic incentives, the implicit achievement motive correlates negatively with behavioral outcomes. He characterized this finding as a suppressor effect, because social-extrinsic incentives did not leave motive-behavior relationships unaffected but seemed to actively drive the implicit motive "away" from its normal behavioral manifestation. Such suppressor effects are not compatible with McClelland et al's (1989) prediction that social-extrinsic incentives should only interact with explicit motives, but not with implicit motives, and thus cast further doubt on the usefulness of the social-extrinsic/task-intrinsic distinction.

In summary, then, previous attempts to pinpoint the properties of stimuli that reliably arouse implicit motives have not been successful. The 1953 model described a process through which stimuli can acquire motivational significance but did not further specify which stimuli are most likely to be furnished with motivational properties. The 1980 distinction between operant and respondent measures of motivation and behavior is inconsistent with the extant motive research literature in that it denies the existence of identifiable motive-arousing

stimuli. And although the 1989 distinction between task-intrinsic and social-extrinsic incentives acknowledges that there must be a class or type of stimuli to which implicit motives respond, it fails to provide a convincing, valid and precise description of the properties of such stimuli. I do not deny that in many cases these attempts to come to grips with the nature of motivational incentives have had some value for thinking about and conducting research on motives. However, to the extent that these attempts have been inaccurate or even misleading, they inadvertently may have contributed to many researchers' frustration and dissatisfaction with the construct of implicit motives and thus eventually to a premature demise of research in this area.

An incentive-representation account of implicit motive arousal

The present approach to delineate the nature of motive-arousing stimuli is based on the notion that humans are simultaneously exposed to two separate, but superimposed forms of reality, one residing in the domain of the symbols of verbal language and the other in the domain of the physical world. Following other theorists of human information processing (most notably Epstein, 1994, Paivio, 1986, 1991, Wilson, 1985, and Zajonc, 1980), I suggest that humans are equipped with two independent systems to process and respond to information originating from these two domains, namely the verbal-symbolic system (VSS) and the experiential system (ES).

The ES processes a reality that is comprised of the sights and sounds, the smells and sensations that impinge on our senses every second. Stimuli from this domain can also be termed experiential stimuli because we perceive and experience them immediately and directly, without the necessity to convert them into a different representational format. A few illustrative examples of such experiential stimuli are: the sight of a friendly, smiling face; the sight of a snake; the sound of an angry voice; the smell of a person's scent; the sensation of an insect crawling on one's skin; the taste of a strawberry, etc. Some experiential stimuli can be directly meaningful for a limited number of needs ensuring the survival of the species and the individual, such as feeding, exploration, social bonding, dominance, sexual procreation, parental care, or harm avoidance. Their meaning for the organism is coded by specific emotional-motivational states, such as curiosity, affection, anger, joy, or fear, that these stimuli elicit unconditionally and that either aim at meeting these needs or indicate the fulfillment of a need. Other experiential stimuli may initially have no particular meaning for these needs, but become meaningful because they reliably cooccur with unconditional stimuli and thus acquire the power to elicit motivational states on their own. This process has also been termed incentive learning and is described by the laws of Pavlovian conditioning (cf. Berridge, 2001). The principles of instrumental conditioning, on the other hand, determine which behaviors the individual will use once a motivational-emotional state has been aroused. Behaviors that in the past have been instrumental in achieving a desired end state under a given set of situational conditions will be the most likely to be recruited, whereas behaviors that have failed in this regard will not be attempted. Which behaviors are instrumental for satisfying a particular need can also be learned through observational learning and imitation (cf. Mazur, 1998). In addition, the ES also hosts learning mechanisms that do not require stimuli to be emotionally significant, as the case of implicit learning demonstrates. Implicit learning, which is defined as learning without intention to learn or awareness of what is being learned, is based on the detection of covariations between stimuli in the environment, and this knowledge can be used to navigate and deal with the environment more effectively (cf. Reber, 1989).

The output of the ES results from these mechanisms of information processing and can simply be the correct prediction of stimuli in the case of implicit learning, but is typically characterized by strong motivational-emotional impulses urging the individual to engage in certain behavioral strategies or avoid others in the case of need-based learning mechanisms. These impulses can also be interpreted as the output of evolutionarily old "command" systems, because they make very strong "suggestions" as to which general course of action should be taken next or what feels "natural" to do (Panksepp, 1998). It is important to point out, though, that while the impulses, feelings, and emotions that they generate may become conscious, the stimuli giving rise to this output and the processing mechanisms that lead to it can remain completely nonconscious. For instance, Dimberg, Thunberg and Elmehed (2000) recently reported that individuals respond affectively to pictures of happy and angry faces that are presented outside of participants' conscious awareness. Öhman and Soares (1994, 1998) have repeatedly demonstrated that subliminally presented neutral stimuli that reliably predict an unconditional stimulus (shock) can acquire emotion-eliciting properties and thus become conditional stimuli without ever reaching conscious awareness. Working with an instrumental avoidance conditioning paradigm that involved an implicit learning task, Corr, Pickering and Gray (1997) found that highly anxious individuals show superior implicit learning of behavior that can stave off punishment (for other examples of nonconscious behavioral conditioning, see Corr, Pickering & Gray, 1995; Gupta & Shukla, 1989; Lieberman, Sunnucks & Kirk, 1998). Although I am not aware of studies dealing with the role of conscious awareness in observational learning in humans, the fact that observational learning can be demonstrated even in chicks makes it seem likely that this form of learning does not require high-level (i.e., self-reflective) consciousness, either (cf. Mazur, 1998).

In the aforementioned studies, psychophysiological and behavioral variables were the main and most strongly affected ES output measures and in many instances, participants themselves were not aware of any change in these variables. And in those studies in which participants consciously experienced a change in affective state in response to non-recognized stimuli, they were prone to attribute their feelings to irrelevant events (e.g., Murphy & Zajonc, 1993). But ES-based stimulus processing and response preparation can also occur in the complete absence of any conscious awareness of the stimuli involved or the motivational state elicited, as a recent study by Winkielman, Berridge, and Wilbarger (2001) shows. These researchers first measured participants' consumption of a fruit-flavored drink, then subliminally presented participants either with a happy face or with an angry face and subsequently assessed participants' drink consumption once more. Intriguingly, participants in the happy-face condition drank more and participants in the angry-face condition drank less after being exposed to the facial stimuli. Even more intriguingly, self-report measures of pleasure and arousal failed to show any change in mood as a function of experimental condition. Thus, conscious awareness of eliciting stimuli, mediating processes, or emotional and behavioral output does not seem to be a necessary requirement for the ES's operation (cf. Kihlstrom, 1999). An individual's ES can therefore process stimuli and generate emotional and behavioral responses without any participation of her or his consciousness.

In phylogenetic terms, the structures and processes constituting the ES are rather old and humans share many of them with other mammalian and non-mammalian species. Technically, they are housed mainly in paleo-

mammalian brain and parts of the reptilian brain, although neocortical structures undoubtedly play a significant role in the fine-grained analysis of stimulus information, too (cf. LeDoux, 1996; MacLean, 1987). There is also evidence that ES-based information processing may be lateralized to the right hemisphere (e.g., Springer & Deutsch, 1998). Because the ES is rooted in subcortical parts of the brain, a considerable part of its output becomes manifested in psychophysiological changes, such as the release of hormones, sweat gland activity, increases or decreases in heart rate and blood pressure, or immune system changes, which are driven by the hypothalamus, the pituitary, and associated structures. Note, however, that evolutionarily old does not mean crude and simple in this context. In fact, some argue that the ES has reached an unprecedented level of complexity, sophistication and openness to environmental influences and learning in humans (LeDoux, 1996; Panksepp, 1998) and it seems very likely that future research on the processes and structures involved in emotion and learning in humans will further add to this picture.

Ontogenetically, the structures and processes involved in the ES's operation maturate and function earlier than those involved in the VSS. For example, emotional responses to stressful and fear-eliciting stimuli can be observed in infants a few weeks after birth and probably even earlier (Kagan, 1994). Similarly, children are able to differentiate between and emotionally respond to emotional facial expressions long before they are able to verbally label those expressions (e.g., Serrano, Iglesias, & Loeches, 1995). Not suprisingly, then, children start to learn at an experiential-emotional level before they acquire language, and these early learning experiences may have long-lasting effects on adult behavior, even though individuals can not verbalize or consciously remember them (Jacobs & Nadel, 1985).

Implicit motives are at home in and part of the experiential system (ES), chiefly because they operate outside of a person's conscious awareness but can manifest themselves in a person's emotions, psychophysiological responses and behavior, and are rooted in socialization experiences in preverbal childhood (e.g., McClelland, 1958, 1987, 1989). Moreover, they have been assumed to modify behavior through Pavlovian and instrumental conditioning mechanisms (McClelland, 1958; Winter, 1996), a hypothesis that has only recently found some emprical confirmation (Schultheiss & Rohde, 2001), and their cross-cultural universality and limited number suggests that they are part of our evolutionary heritage. This general argument is not entirely new; McClelland (1987), McClelland et al (1989) and Weinberger and McClelland (1990) have also proposed that implicit motives are rooted in the older, emotional reaches and functions of the brain. What is new about the position presented here is the notion that if implicit motives are part of the ES, they should primarily be aroused by and respond to experiential stimuli. Thus, for instance, a person's power motive should more likely be triggered by another person's threatening gestures, loud voice and angry face than by the words "I am going to sue you for this!", a person's affiliation motive should respond more strongly to another person's smiles and affectionate touches than to the words "I really like you!", and a person's achievement motive should be more easily satisfied by having some tangible proof of doing well on a task, such as increased output or quicker performance, than by the words "You have done well on this task". A similar point was made by LeDoux (1996) with reference to unconscious and emotional information processing in general:

> "[Verbal stimuli] are the currency of the systems that are involved in conscious processing, which is an evolutionarily new system. Unconscious processing, on the other hand, is the stock-in-trade of evolutionarily old systems that are likely to be more readily studied with nonverbal measures." (p. 308). And: "We will probably not gain an accurate picture of how the more basic unconscious systems work as long as most work on unconscious processing is done using verbal stimuli." (p. 312)

Before I go into the ramifications and subtleties of my hypothesis, however, it is necessary to take a closer look at the properties of the VSS first to better understand how this system differs from the ES, why verbal stimuli and instructions may not be effective in activating implicit motives, and how the ES and VSS may interact in processing information and shaping behavior.

The reality processed by the verbal-symbolic system (VSS) is that of verbal language, of the written or spoken words that humans use to communicate with each other. One of the great advantages of language is that it frees its user from the constraints of the presently experienced situation and can refer to objects or events that happen or exist far away, or in the distant past or future, or to intangible ideas and concepts that may completely lack any direct manifestation in the experiential world (e.g., "virtue", "locus of control", "quantum"). It also provides symbolic "shortcuts" for whole classes of events, objects and situations and thus makes it possible to encapsulate very complex, rich, and extended experiences in one word or phrase (e.g., "Let's go wild-water rafting").

The VSS encodes information by translating nonverbal information into a symbolic format (i.e., naming an object or event) or directly from the verbal information received from others. This information is retained in verbal form in declarative memory and typically deals with spatial, temporal, or causal relationships between persons, objects, events or their attributes. In contrast to the learning mechanisms governing the ES, learning in the VSS does not depend on the survival value of an information or the covariation frequency of stimuli or events; rather, acquisition of new knowledge is primarily determined by its fit or lack of fit with existing knowledge in declarative memory, by its meaningfulness in the context of what is already known. Within these constraints, the contents of declarative memory are freely programmable and allow for a myriad of possible connections and associations between elements (Paivio, 1986).

As in the case of the ES, the output of information processing in the VSS can control behavior. In the simplest case, verbally represented knowledge forms the basis of choices and decisions of whether to engage in a behavior or not. Knowing that today is a Tuesday (a completely abstract, language-based concept, since the sun does not rise in the morning with a different color for every day of the week), I got up early this morning and went to my office. Had it been a Sunday, I would not have done that. In more complex cases, verbally based knowledge can help to schedule and pace elaborate behavioral sequences that are difficult or have never been executed before, such as baking a cake according to a recipe, or driving a car for the first time. It can also tell a person when to refrain from certain behaviors because they might be dangerous, even though the person may never before have actually experienced the danger or the danger itself may be completely intangible (exposing oneself to an activated X-ray machine for half an hour would be a case in point).

But this influence of the VSS on behavior immediately begs the question: Why is there a second behavior-

guiding system, if there already exists one system (the ES) that can adapt the organism's behavior to the demands of the environment in complex ways? A look at some of the emerging functions of language over the course of development may suggest an answer. When children start to acquire language at age 2 to 3 years, this process greatly expands their possibilities of social interaction. At the same time, it also opens the door for parents to better regulate their childrens' behavior by verbally instructing them about do's and don'ts and the norms and standards of social conduct. Typically, these rules aim either at making children do something they are not motivated to do, or at channeling their motivational-emotional impulses into socially accepted outlets, or at inhibiting such impulses altogether. Over time, children pick up such verbally transmitted rules, expectations and norms and use them to instruct themselves and regulate their own behavior, even in the absence of their parents or other authority figures. Initially, this process is readily observable, because children are audibly talking to themselves, but it becomes more covert in middle childhood when children learn to speak to themselves silently (cf. Vygotsky, 1986; Zivin, 1979). Thus, the acquisition of language introduces self-instruction as an important tool for the regulation of behavior in the service of complex social demands, a tool that has the capacity to override the output of an individual's ES and make his or her behavior consistent with others' expectations.

Language also has a second, more indirect, socializing function on behavior by helping children to wait for a reward for a longer time than they could if their behavior were completely ES-controlled. As Mischel's (1996; Mischel, Shoda, & Rodriguez, 1989) work on delay of gratification shows, language enables children to keep a representation of the desired incentive in their minds that is abstract enough to make it easy to wait for (rather than to get motivationally aroused and go for the next available substitute), but reminds them of the existence of the future incentive at the same time. The importance of this function of symbolic language can hardly be overstated as it enables humans to develop, mentally represent, and tenaciously pursue long-term goals and thus makes their social behavior more stable and dependable than it could ever be were it purely ES-driven. Not surprisingly, then, adolescents who have been particularly adept at delaying gratification in childhood are also likely to be described by others as deliberative, planful, dependable, persistent, competent and verbally skilled (Mischel, Shoda, & Peake, 1988; see also Funder, Block, & Block, 1983).

I suggest, however, that the VSS's very power to encapsulate a particular incentive in a string of symbols is a double-edged sword. Through the development of delay of gratification, individuals learn to use the verbal-symbolic mode of incentive representation and may grow used to the fact that goals represented in this way do not experientially arouse a strong motivational-emotional state. At the same time they may come to <u>expect</u> that they will experience such a state when they finally attain the incentive. Therefore, the development of gratification delay through symbolization not only enables them to pursue long-term goals, but may also make them more vulnerable to adopt and pursue goals that may not be emotionally rewarding in the end. I will present some evidence for this hypothesis below.

Verbal-symbolic language is also a necessary prerequisite of conscious thought and a sense of self, and both are closely related to each other. According to a theory presented by Jaynes (1986, 1990), one of the main reasons why language evolved in early hunter-gatherer communities was that it enabled early humans to modify

other group members' behavior through commands, which in turn may have served a behavior-stabilizing function and have increased the level and complexity of social coordination within the group. That simple verbal commands can have such power over another person's behavior is still evident today in, for instance, the phenomenon of hypnosis or studies of obedience to authority (e.g., Milgram, 1963; see also Miller, Galanter, & Pribram, 1960, chapter 8). Jaynes contends that early humans were not conscious and aware of themselves in the same way modern humans are, and speculates that their VSSs generated hallucinatory voices that they attributed to authority figures in their tribe or to gods and that controlled their actions when other group members were not around. He also points out that early languages did not start out with the vocabulary that would have enabled individuals to think of themselves in terms of an "I", a "Me" or as possessing a "Self". Rather, modern human consciousness and self-awareness evolved when language became more metaphorical and words that had originally been used for phenomena and processes of the outside world were applied to "spaces" and states inside a person, eventually giving rise to the metaphorical mind-space of an "I" and to a self. An example of this process is the word comprehend whose original literal meaning was "to get a firm grip on something", but was later used in Latin and in modern languages to denote the mental process of making sense of, grasping (!) something. Another example is the Greek word psychein, which originally meant "to breathe", but as a noun later was used to mean "mind" or "spirit" (this word, too, has its root in "breathing"). Thus, humans came to think about themselves and to develop a self only to the extent that they developed the necessary verbal-symbolic tools. At this point, Jaynes claims, they no longer hallucinated commanding voices that aligned their behavior with the demands of the group but could now instruct themselves about what to do.

While the specifics of Jaynes' theory (e.g., the concept of a bicameral consciousness) are often speculative and may be open to debate, its bottom line is highly compatible with developmental (cf. the previous section on the development of language) as well as social psychological (cf. Cooley, 1964; Mead, 1968) and cognitive (cf. Hunt & Agnoli, 1991; Mandelbaum, 1963; Whorf, 1971) accounts of the functions of language: symbolic language, and in its wake consciousness and the self, evolved to improve coordination within complex social groups and to represent the expectations, demands and goals of the group in the mind of the individual. It did not evolve to consciously represent the needs, emotions, and motivations of an individual within the individual. The ES would not require such a reduplication of its functions and outputs on a verbal-symbolic level to control behavior adaptively and efficiently.

According to this point of view, the self is basically and inherently an agent and representative of the social group within the skin of the individual and not a structure whose primary function is to read out and represent the individual's ES. This helps to explain why people may often not be in a better position than outside observers to understand themselves and need to rely on self-observation, feedback from others, or causal theories and emotional scripts to decipher (or reconstruct) their own feelings, motivations, and behaviors (cf. Bem, 1972; Nisbett & Wilson, 1977; Wilson, 1985). As LeDoux (1987) has pointed out, the functional independence between the VSS and the ES may be due to the fact that although those parts of the neocortex that are associated with language functions (i.e., the left-hemispherical areas of Wernicke and Broca) are extensively connected with other neocortical structures (e.g., frontal and prefrontal cortices; cf. Deacon, 1997), they only have few direct connections to limbic structures

involved in emotional processing of information.

Of course, inferring one's motivational-emotional states from indirect cues can be inaccurate and error-prone, especially if one is looking in the wrong place, lacking the words to identify them, or misattributing them (cf. Schachter & Singer, 1962), or only relies on general beliefs or sociocultural scripts (e.g., "I haven't slept much last night, therefore I must feel crummy now"; cf. Nisbett & Wilson, 1977). Individuals may thus develop views of themselves, their ways of responding emotionally to events or their enduring motivational aspirations that can be inconcongruent with the operating characteristics and preferences of their ESs. I suggest that this is the deeper reason why self-report measures of motives typically do not correlate with measures of implicit motivation.

In summary, the ES and the VSS are dissociable systems that process different kinds of information (experiential vs. verbal-symbolic) and serve different functions: the ES is primarily driven by the motivational-emotional needs of the individual, whereas the VSS has evolved to represent the needs of the social group and the wider sociocultural context one is part of.[1] I would like to point out in passing that evidence for the existence and dissociability of these two systems comes from a diverse range of psychological research outside the area of motivation. For instance, Brewin (1989; Brewin, Dalgleish, & Joseph, 1996) has pointed out that traumatic experiences split up in memory into an emotional component that is reactivated by experiential cues and a declarative component that is accessible to consciousness and can be verbalized. Importantly, the emotional component is likely to become dissociated from the verbal one and lead a life of its own, manifesting itself in spontaneous flashbacks and intrusive imagery. Bechara, Damasio, and Tranel (1995) have presented an elegant study that focuses on some of the brain structures and learning processes that presumably underly such ES-VSS dissociations. They compared normal individuals with amygdala-lesioned, hippocampus-lesioned, and amygdala/hippocampus-lesioned individuals in a study in which participants could learn both verbally and experientially a contingency between a visual stimulus and a subsequent startling noise. After learning, normal participants were able to verbally report the contingency (an indicator of information processing in the VSS) and also showed an anticipatory change in skin conductance in response to the noise-predicting stimulus (an indicator of information processing in the ES). Notably, hippocampus-lesioned participants were unable to consciously detect the contingency, although they showed an anticipatory skin conductance response; amygdala-lesioned participants were able to verbally report the contingency but did not show the skin conductance response; and participants with lesions in both structures showed no verbal or experiential learning at all. The Bechara et al (1995) study therefore provides direct neurological evidence for the existence and functional as well as anatomical independence of two fundamentally different information processing systems, one entailing consciousness and the use of symbolic language and the other operating at a nonconscious, experiential level.

Motive-goal dissociations in experiments and everyday life

At this point, let's return to the problem precipitating the aforegoing theoretical analysis: Why have, as Klinger (1966) stated, so many experimental studies failed to find any direct and straightforward effects of implicit motives and behavior? Why have researchers sometimes obtained paradoxical effects where a motive had effects on behavior that were diametrically opposed to those hypothesized (cf. Lazarus, 1961)? I believe that the two-systems

model of information processing presented above provides an answer to these questions if it is used to carefully dissect the mode of incentive presentation in a typical laboratory experiment.

Consider the case of an experimenter assigning an achievement goal to a participant with the words: "Next, you will work on an arithmetic task. Try to give your best and solve as many arithmetic problems in five minutes as possible" and trusting that this instruction will serve to engage the participant's implicit achievement motive in the subsequent task. The participant's verbal-symbolic system (VSS) readily processes this instruction and understands that the experimenter is placing value on high performance at this task. However, this information is not registering with the participant's experiential system (ES) and therefore not arousing her or his implicit achievement motive, because it is not presented in a format that the ES can process. Rather, the participant's ES is responding to experiential aspects of the situation, such as the experimenter's facial expression, tone of voice or behavior or other participants' behavior. This does not necessarily preclude that the participant's achievement motive (or another motive) may become aroused by situational cues in some other way, but these cues are most likely not under the experimenter's deliberate control. In fact, since the achievement motive also has a strong autonomy component which involves resistance to influence and conformity pressures (deCharms, Morrison, Reitman, & McClelland, 1955; McClelland et al, 1953), uncontrolled experiential features of the testing situation, such as an experimenter's nonverbal "pushiness", can actually make participants with a strong achievement motive less willing to collaborate on an achievement-related task than participants low in achievement motivation. This line of reasoning may provide an explanation for the suppressor effects found by Spangler (1992), but further research is needed to clarify their nature and origin.

On the other hand, the experimenter's nonverbal behavior may also happen to be genuinely motive-arousing in some way. Interestingly, this notion is supported by some findings of a study that Klinger (1967) reports. In this study, an actor played either an achievement-oriented, an affiliative, or a neutral experimenter. Participants in a sound condition were in the same room with the experimenter and were exposed to his verbal instructions and behavior, while participants in a no-sound condition observed the experimenter in another room on a television monitor but could not hear his instructions. Afterwards, all participants were administered a TAT. Participants in the sound condition wrote TAT stories highly saturated with achievement imagery when the experimenter had acted in an achievement-oriented manner, but not if he had remained neutral or shown affiliative characteristics. Surprisingly, participants in the no-sound condition produced exactly the same differences in achievement imagery in response to the three different behavioral styles after just watching, but not hearing, the experimenter. This pattern of findings demonstrates that it may not actually be the content of an experimenter's instructions but other, nonverbal features of her or his behavior that arouse a person's implicit motives.

While this general analysis of experimental studies on implicit motives may, from the vantage point of the present information processing account, help explain why in the past researchers have sometimes obtained reasonable and predicted findings with motive measures (even though they may not have been aware of the situational factors that truly aroused participants' motives) and sometimes no or even paradoxical results (because they were unaware of these factors), it also highlights a central problem arising from the different operating

characteristics of the ES and the VSS. As I have pointed out before, the ES responds to experienced features and stimuli of the present situation, whereas the VSS can receive, transmit, and deal with information that symbolically codes future (or past, or far-away) situations that cannot presently be experienced and processed by the ES. Since the goals that researchers assign to their participants in experimental studies, and even more so the goals people adopt from or negotiate with others in their everyday lives, typically precede the actual situation in which the goals are pursued and realized, the ES and the VSS do not process the same kind of information in parallel at the moment of goal choice or adoption. Rather, the VSS is now dealing with the future in the form of a potential goal that the individual can choose, adopt, or become committed to while the ES continues to process stimuli and incentives in the present situation. As a consequence, a person's goal choice or level of commitment to an assigned goal may not be influenced at all by the motivational contents inherent in the pursuit of goal but depend on experiential features of the goal-choice/adoption situation which, of course, can be completely dissimilar from the goal-enactment situation.

This account of goal-related information processing in experimental studies and real-life situations ties in with research demonstrating that individuals may use the output of their ES, namely, moods, feelings and affect, as input for their VSS and thus as information upon which they base their judgments and decisions, even though the ES's output may not be triggered by anything related to the decision at all (cf. Schwarz, 1990; Schwarz & Bohner, 1996). According to Schwarz, individuals often use a "How do I feel about it?" heuristic when asked to make a particular judgment or decision. The effects of this heuristic are nicely illustrated by a study by Saavedra and Earley (1991). They found that individuals exposed to a funny Woody Allen movie were more than twice as likely to continue pursuing an assigned goal than to change to a new goal, whereas individuals exposed to a documentary about torture were more than three times as likely to switch to a new goal than to stick to the assigned goal. Needless to say, the goals involved in this study (evaluations of the work of fictitious employees) were not in any way related to the mood-inducing content of the film clips shown. Thus, consistent with Schwarz' feelings-as-information model, the positive or negative emotions that the ES emits in response to experiential features of the goal-choice situation can influence the individual's goal choice, although not in a way that has anything to do with the goal itself.

This conclusion is also supported by findings regarding the role of implicit motives in goal choice and goal commitment. With the exception of a study by Emmons and McAdams (1991), who reported motive-goal correlations in the .30 to .40 range, survey studies of people's personal goals and strivings have consistently failed to produce significant or substantial correlations between individuals' sense of commitment to a goal or the motivational content of a goal and their implicit motives (Brunstein et al., 1998; Brunstein, Lautenschlager, Nawroth, Pöhlmann & Schultheiss, 1995; King, 1995). For instance, King (1995) found that the motivational content of her participants' goals and their TAT stories correlated only .18, -.07, and .17 for the domains of achievement, affiliation, and power. Similarly, Brunstein et al (1998) reported that students' implicit agency motive (i.e., need for power + need for achievement) correlated at -.06 with their commitment to agentic goals (i.e., goals related to mastery and social influence) and their implicit communion motive (i.e., need for affiliation + need for intimacy) correlated at -.09 with their commitment to communal goals (i.e., goals related to interpersonal closeness and friendly relationships). Consistent with the findings of these survey studies, more highly controlled laboratory

studies on the role of implicit motives in goal-choice situations also fail to show any influence of motives on participants' decisions (e.g., Brunstein & Hoyer, in press; Locke & Latham, 1990, p. 214).

However, while these studies document that, by and large, individuals' personal goals are not well-aligned with their implicit motives, Brunstein et al. (1998) found that progress on motive-congruent goals translated into enhanced emotional satisfaction, whereas progress on motive-incongruent goals did not provide individuals with an increased sense of satisfaction and contentment. Thus, although motives may not contribute to individuals' commitment to a goal, they determine how much pleasure they can draw from its enactment, which involves the consummation of motive-specific incentives. Viewed from a different angle, these results suggest that by pursuing motive-incongruent goals, a person is more likely to expose his or her ES to situations that do not contain motive-relevant incentives, and by allocating time to the pursuit of such goals to reduce his or her exposure to situations containing motivationally stimulating or rewarding stimuli. This notion is supported by Brunstein et al's (1998) finding that high levels of commitment to motive-incongruent goals led to slow progress on motive-congruent goals, which in turn was associated with increased feelings of dissatisfaction.

Taken together, these findings indicate that whether a person chooses or becomes committed to, for instance, an achievement goal does not depend on that person's implicit achievement motive, but whether a person can become happy with the chosen goal does. Thus, the VSS's capability to represent and deal with verbally coded future actions and end-states that are not accessible for the ES seems to put individuals at risk for choosing and pursuing goals that are not backed up by their implicit motives. The above analysis would suggest that even in those instances in which a chosen or adopted goal does correspond to a person's implicit motives, the choice may only indicate that the incentives present in the goal-choice situation for some reason happened to arouse the same motive that the goal is tailored to, but not necessarily that the person's ES is responding to the content of the verbally presented goal itself. But is there a way to make the ES process goal-related information that has been fed in symbolic form to the VSS and thus to ensure that a person's implicit motives are responding to the goal? In other words: Is it possible to pull the verbally coded future into the experiential present and make a person see, hear and feel what it would be like to pursue a goal, be it in a lab experiment or in real life?

The goal imagery technique in research on implicit motives

I propose that goal imagery, defined as the perception-like mental representation of the pursuit and attainment of a goal (Schultheiss & Brunstein, 1999), can serve this function and be put to fruitful use in experimental research on implicit motives. Research on mental imagery has provided ample evidence that imagining an object, event or even a complex situation can be equivalent to actually perceiving it, both in terms of the information processing systems involved in and the emotional responses triggered by it. For instance, visual and auditory imagery activate the same brain areas that are involved in processing incoming visual and auditory information, which can sometimes even lead to direct competition between imagery and perception for processing resources (Farah, 1985, 1988; Farah, Peronnet, Gonon, & Giard, 1988; Kosslyn, 1994; Kosslyn et al., 1993; Zatorre & Halpern, 1993). Moreover, studies using neuroimaging techniques, psychophysiological measures, self-reported mood or facial expressions as indicators of the emotional impact of mental imagery demonstrate that imagining an

affectively charged situation can be just as emotion-arousing as actually experiencing it (Qualls, 1982/1983; Richardson, 1984; Schwartz, Weinberger, & Singer, 1981; Shin et al., 1997; Sirota & Schwartz, 1982). For example, Sirota and Schwartz (1982) found that individuals responded with increased corrugator activity (involved in furrowing the brow) to imagining a sad scene and with increases zygomatic activity (involved in smiling) to imagining an uplifting scene, and activity in these same muscles also accompanies the perception of negatively and positively valenced stimuli (cf. Caccioppo, Petty, Losch, & Kim, 1986). Further evidence for the efficacy of imagery to elicit strong emotional responses comes from studies with clinical populations. Individuals suffering from generalized anxiety disorder show a preponderance of verbal-symbolic and a lack of imaginal thought, presumably because they try to avoid anxiety-inducing mental images (Borkovec & Inz, 1990). Snake phobics deteriorate in their ability to extract information from an imagined object once they are instructed to combine the object in their mind's eye with a snake or a snake-like piece of rope (Suler & Katkin, 1988). But the emotional power of mental imagery can also be used fruitfully in clinical settings, as, for instance, in the desensitization and treatment of patients suffering from a variety of anxiety disorders (e.g., Drobes & Lang, 1995). All in all, these findings suggest that mental imagery of an object or situation is equivalent to the direct perception of that object or situation in its ability to induce experiential processing and arouse motivational-emotional impulses.

Based on these lines of evidence, it seems plausible that vividly imagining the pursuit and realization of a potential goal should have the capacity to elicit a positive affective response and thus to motivate an individual to pursue a goal (cf. Paivio, 1985), provided that the goal fits, and resonates with, her or his implicit motive dispositions. A lack of fit, on the other hand, should become apparent by an absence of such emotional-motivational states in response to goal imagery or, in the case of goals that are directly opposed to a particular motive (e.g., an assertive power goal assigned to a person high in intimacy motivation), even by feelings of aversion. While the emotions triggered by goal imagery can have a direct, motivating effect on behavior, thus priming the individual for the pursuit of the goal, the individual can also use them to make an informed decision about whether or not to adopt and pursue a particular goal, because now her or his affective response to the goal actually reflects the goal's fit with her or his implicit motives. Without the translation of the verbal representation of a goal into imagery, however, the person's implicit motives cannot be aroused by the incentives associated with the goal, and her or his decision and motivation to pursue the goal should therefore not be influenced by the goal's match or mismatch with her or his motives.

I have tested these hypotheses in a series of four studies in which I used goal imagery as an experimental technique to engage participants' implicit motives in the adoption and enactment of an assigned goal by letting them explore the goal under the guidance of carefully constructed, tape-recorded imagery scripts (the appendix provides an example from Study 4). All goal imagery exercises were introduced by a short relaxation exercise in the course of which participants were asked to close their eyes and focus on their inner feelings and images. In the subsequently presented goal imagery scripts highly concrete and detail-rich language was used to describe the pursuit and attainment of the assigned goal, but participants' emotional or motivational response to various aspects of the goal were not specified. Rather, in each script the listener was prompted several times to pay close attention to his or her

feelings and affective states after the description of a key sequence or element in the pursuit of the goal. The total length of the goal imagery exercises was typically around 10 min. Table 1 provides an example of a goal imagery script.

The effect of goal imagery on participants' motivation and behavior was assessed by a self-report measure of goal commitment (Study 1), task performance (Study 2), verbal and nonverbal behavior (Study 3) and hormonal changes (Study 4). In all studies, participants' motives were measured with a TAT-type measure at the beginning of a session and the goal imagery exercises (or control group procedures) were conducted after the experimenter had assigned participants the goal with precise and detailed verbal descriptions of the motivational incentives involved in its pursuit. Dependent measures were obtained subsequently.

Study 1: Implicit power and affiliation motivation and commitment to a directive counseling goal

In an initial study, we (Schultheiss & Brunstein, 1999, Study 1) tested whether individuals' commitment to an assigned goal would reflect their implicit motives more closely after they had explored the assigned goal in their imagination than if they had only received the experimenter's description of the goal. The experiment was described

Table 1.

Sample goal imagery script (used by Schultheiss, Campbell, & McClelland, 1999).

The following goal imagery script was read by a native English speaker in a neutral tone of voice and tape-recorded. The speaker paused for 5 sec after each sentence and for 15 sec after each affect-focus question to give participants time to update their mental pictures and become aware of their emotional responses.

"Can you feel the weight of your body? Can you feel your hands and your feet? Can you feel that one arm is less relaxed than the other? Can you feel that one leg is more relaxed than the other? Can you close your eyes? Can you keep your eyes closed during the next few minutes? Can you imagine the distance between the top of your head and your chin? Can you imagine looking at someone who is standing far away from you? Can you feel the tension dissolve? Can you imagine the space inside your mouth? Can you feel a warm sensation somewhere in your body? Please keep your eyes closed and allow yourself to feel comfortably warm.

You are sitting on an uncushioned metal chair, the pencil is in your hand and the first test form is in front of you on the table. You can hear your competitor, who is sitting at the other desk, shuffling his feet. The air in the room is dry and carries the smell of old books and papers. You position the pencil on the number one on your test form. The experimenter says "Go!" and you start tracking the numbers as fast as you can. You can hear the other guy's pencil racing across his test form. He is fast — but you are faster. You can see that you are closing in on the highlighted last number. You are three numbers away, two numbers, one number - you reach the final number and cry "Stop". The other guy drops his pencil and exhales audibly. What do you feel right now?

You turn the page and position your pencil on the next test form. "Go", the experimenter says, and already you are tracking the numbers as fast as you can, your fingers tightly gripping the pencil. Again, you can see that you are approaching the highlighted final number. Suddenly your competitor cries "Stop" - and you have to stop and drop the pencil, still a few numbers away from the last number. What do you feel right now?

And off you go for a third time, racing through the numbers like a devil, determined to outspeed your competitor this time. And yes - now it's you who finishes first and cries stop. You hear the other guy grunting, but you are already eager for yet another test. And on and on you go, being the first to finish and keeping the other guy from finishing first more and more often. Finally, you have worked your way through all the tests. You realize that you scored first more often than the other guy and that you have won the competition. The other guy couldn't keep up with you in the end. What do you feel right now?

Now come back into this room slowly. Try to concentrate on your body. Take some deep breaths. And open your eyes."

to male and female participants (N = 50) as a comparative study of experts' and laymens' use of directive techniques in counseling a client. The experimenter explained that they were to meet another person (the "client") who was willing to discuss with them a problem that was currently troubling her or him. Participants were instructed to counsel their client in a directive manner, that is, to interrupt and advise the client whenever necessary, to keep her or him focused on the problem and to take an assertive lead in the conversation. The experimenter explained that prior research had proved this strategy to be useful in helping people cope with their problems effectively.

We expected this goal to provide an incentive for individuals high in the implicit needs for power and affiliation, because helping allows to both have impact on and to establish a positive, friendly relationship with someone. It should be less suitable for individuals high only in power or only in affiliation, though, because it required too much social moderation for the former and too indirect an opportunity to make friends for the latter. Finally, for individuals low in both motivational dispositions, the incentives associated with the goal should not be motivationally arousing at all.

After the experimenter had assigned the directive-counseling goal to all participants, half of them (the experimental group) listened to a goal-imagery exercise that described the expected counseling session from the "therapist's" point of view, featuring a model scenario that contained all the elements of directive counseling that the experimenter had described before. Participants in the control group did not receive this treatment. Subsequently, all participants filled out a six-item goal commitment questionnaire that queried them about their affective involvement in the ascribed goal (e.g., "I am thrilled by the prospect of counseling my client in a directive manner"), the importance of the goal (e.g., "I find it important to counsel my client in a directive manner") and the effort they intended to invest in the goal (e.g., "I will try as hard as I can to counsel my client in a directive manner"). The experiment was then stopped and all participants were debriefed.

The results of this study were fully in line with our hypotheses. As Figure 1 shows, participants in the experimental group who were high in power and affiliation motivation were strongly committed to the goal of counseling a client in a directive manner (it seems notable that they obtained an average score of 40.59 on a scale that ended at 42). Experimental-group participants who did not have this set of motivational dispositions, however, reported considerably less commitment to the assigned goal. In control-group participants, on the other hand, the power and the affiliation motive did not have any detectable conjoint influence on goal commitment. These findings suggest that participants' inclination to adopt an assigned goal reflected and was consistent with their implicit motives only after they had translated the goal into an experiential format through imagination. Without goal imagery, their decision to vigorously pursue the goal was unrelated to their motive dispositions, despite the experimenter's detailed verbal description of the motivational incentives inherent in the goal.

The results from the control group closely resemble those from many previous laboratory and survey studies on the influence of implicit motives on goal commitment. They thus reinforce the notion that feeding motivational incentives into the VSS without attempting to also make them accessible to the ES can readily lead to discrepancies between an individual's motivational needs and her or his goals. As the experimental-group findings demonstrate, however, this outcome is not inevitable and can be changed through an active effort to help the ES

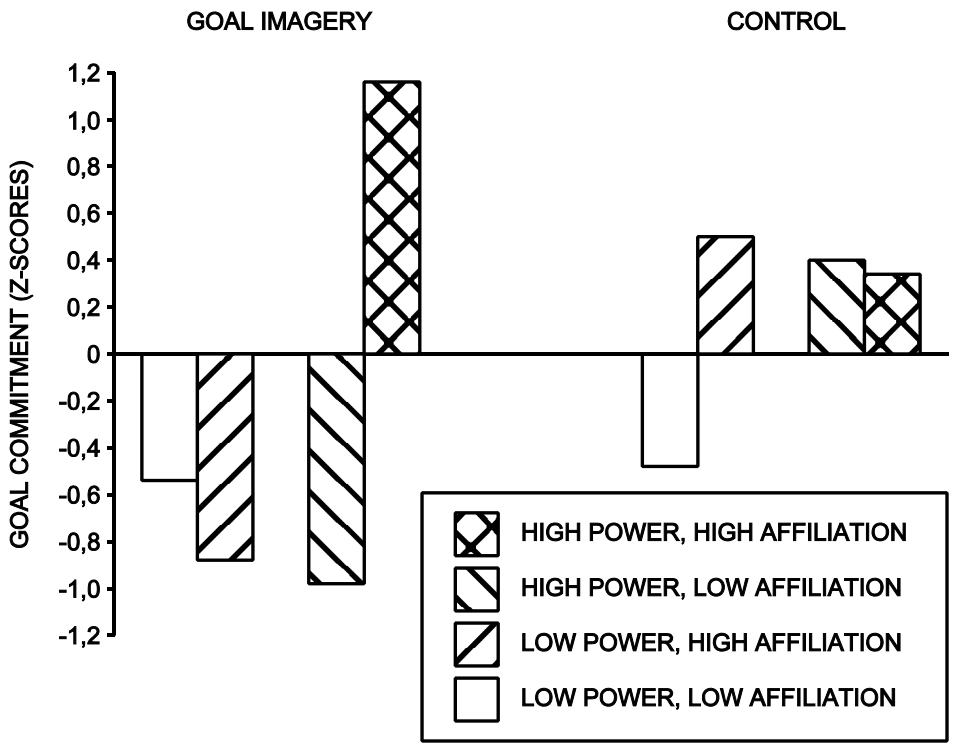

Figure 1. Regression-estimated goal commitment as a function of experimental condition (goal imagery vs. control), power motive, and affiliation motive for values 1 SD above (high) or below (low) the means of the motive variables. From: Schultheiss, O. C., & Brunstein, J. C. (1999). Goal imagery: Bridging the gap between implicit motives and explicit goals. Journal of Personality, 67, 1-38. Copyright (c) 1999 by Blackwell Publishers. Reprinted with permission.

process the goal's incentives. But will the synchronizing effects of goal imagery on VSS and ES functioning also emerge for behavioral indicators beyond self-reported goal commitment? And is it really the motivational content of goal imagery that establishes between-systems alignment or is it simply the fact that a person relaxes or engages in imaginal activity, regardless of its content?

Study 2: Implicit power motivation and performance in a competitive computer game

To address these questions, we (Schultheiss & Brunstein, 1999, Study 2) conducted a second study in which we explored the effect of goal imagery on performance in a speed- and coordination based task. This time, we developed a task that contained only power-related and no affiliation incentives. Specifically, participants (N = 52) played a simple computer game ("Tetris") which allowed them to collect points on each game. Depending on the total amount of points won in each game, they could enter their name in a highscore list presented at the end of each game. The goal assigned for this task was to surpass the current number one player on the highscore list (an entry at 52,087 points signed "Andreas Fischer") and thereby becoming the new number one player. The experimenter explained to participants that other indivduals had already played this game and thus created the highscore list they saw at the end of the first game. He went on to mention that he had been very impressed by the performance of the top-ranked player Andreas Fischer whose score had been truly outstanding and who, after becoming number one, had expressed his confidence that nobody would be able to beat him. He then suggested that the participant might try

his luck and attempt to surpass Andreas Fischer. We expected that ascending in the highscore list and trying to beat the top-ranked player would provide an incentive for individuals with a strong implicit power motive because of their strong concern with social ranking and prestige (McClelland, 1987). This assumption is consistent with previous research documenting that power-motivated individuals often use performance goals as a means to gain recognition and fame (e.g., Veroff, Depner, Kulka, & Douvan, 1980). Because this outlet of the need for power may be more characteristic of men than of women, however, only male participants were recruited for this study.

Participants in the goal imagery condition listened to a goal imagery script that described how, after some initial setbacks, they eventually managed to score high enough to enter their own name in the highscore list. Over the course of the next games, they were getting better and better until finally their performance surpasses that of the current number one and they eliminate his name from the highscore list by entering their own. In contrast, participants in the neutral imagery condition were presented a scenario in which they focused on the movements and properties of the game elements of Testris and their attempts to maneuvre these elements across the screen. Neutral-imagery participants listened to the same relaxation exercise as goal-imagery participants before the imagery script.

After that, participants were allowed to play Tetris for a maximum of 30 min and the computer unobtrusively recorded their performance and highscore list entries on each game. As depicted in Figure 2, the results obtained for the performance measure supported our general hypotheses. Using the highest score participants

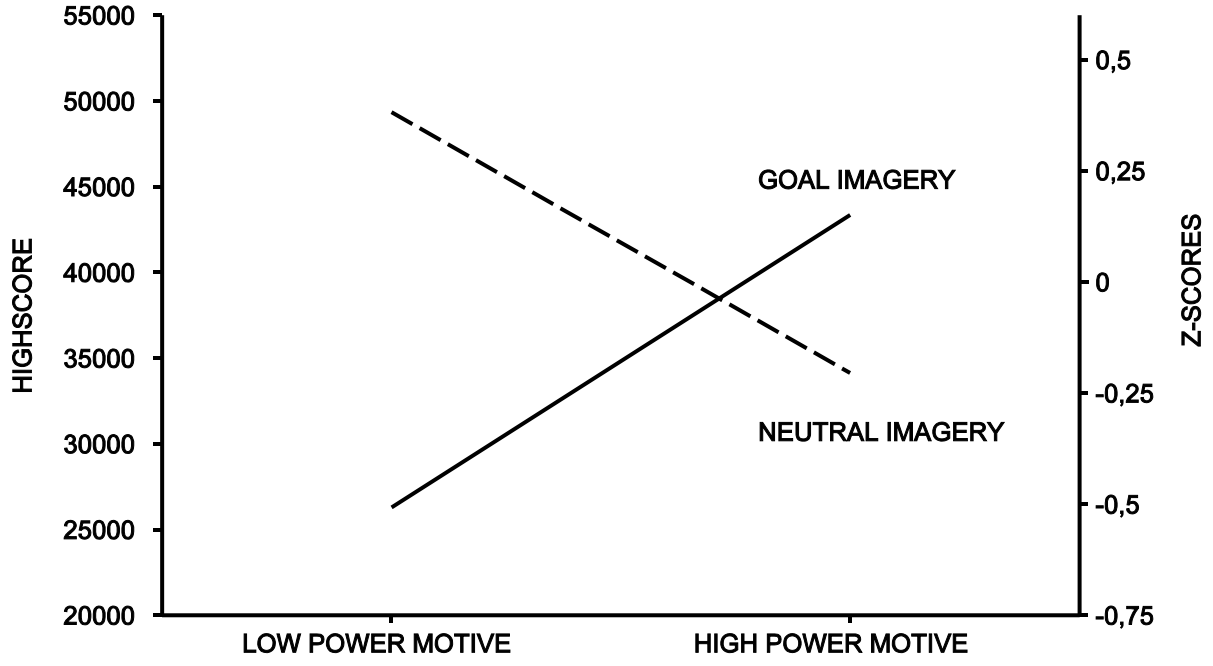

Figure 2. Regression-estimated performance score on best game as a function of experimental condition (goal imagery vs. neutral imagery) and power motive for values 1 SD above (high) or below (low) the mean of the motive variable. From: Schultheiss, O. C., & Brunstein, J. C. (1999). Goal imagery: Bridging the gap between implicit motives and explicit goals. Journal of Personality, 67, 1-38. Copyright (c) 1999 by Blackwell Publishers. Reprinted with permission.

obtained in any of their games as a measure of their motivation to reach the top of the highscore list, we found that among goal-imagery participants, higher levels of implicit power motivation significantly predicted better performance and were also associated with a higher likelihood to become the new top-ranking player. In neutral-imagery participants, in contrast, the power motive was a negative but insignificant predictor of performance and top-rank attainment.[2] Notably, goal-imagery participants high in power motivation were also more likely than those low in power motivation or high- and low-power participants in the neutral-imagery group to "leave their mark" in the highscore list by signing their best game with their full or last name.

Complementing the finding from Study 1 that goal imagery makes individuals' commitment to a goal contingent on their motive dispositions, the results of this study thus demonstrate that translating a goal into an experiential representational format also generates the motivation in the ES that is necessary to pursue and realize an assigned goal, provided that it matches a person's implicit motives. Furthermore, this study yields evidence that it is not relaxation combined with imaginal activity per se that is "opening up" the ES for a verbal-symbolic goal but the actual content of individuals' imaginations. As the results in the neutral-imagery group show, relaxation plus mental imagery of motivationally irrelevant aspects of a goal fails to arouse a person's implicit motive and engage it in the enactment of the assigned goal.

Study 3: Inhibited power motivation and behavior in a persuasive communication task

In a subsequent third study, we (Schultheiss & Brunstein, in press b) explored the effect of goal imagery on the expression of implicit motives in complex social behavior. To do this, we used a persuasive communication task in which male and female participants ($N = 68$) were instructed to present their point of view on a controversial topic (i.e., ethical limits for experimentation with animals) to another person as convincingly as possible. Based on previous findings suggesting that power-motivated individuals may be especially adept at influencing others, provided that they can curb their more impulsive, antisocial impulses (e.g., McClelland & Boyatzis, 1982), we reasoned that this task would represent a strong incentive for individuals characterized by high levels both of implicit power motivation and activity inhibition, a TAT-derived measure of impulse control (cf. McClelland, 1979).

A goal-imagery condition, in which participants first listened to a relaxation exercise and then to a goal imagery script, was pitted against a relaxation condition, in which participants listened to the relaxation exercise only. The goal imagery script led participants to imagine how they presented convincing arguments in favor of their own point of view, while at the same time taking apart the opponent's position, and how the opponent becomes increasingly less confident of her or his own position. Afterwards, participants met their opponent (who was actually a confederate of the experimenter) in another room and started the discussion by presenting their own point of view for as long as they liked. Throughout this presentation, the "opponent" remained neutral, but attentive, and never commented participants' statements. After participants were finished, he stopped the experiment and debriefed them.

Participants' presentations were videotaped and later coded for a variety of verbal and nonverbal behaviors, such as number of arguments presented, balance of pro and con arguments, speech fluency, gesturing, eye contact, etc. Each videotaped speech was also judged by four observers on scales assessing the overall persuasiveness of participants' presentation. Once more, the results provided support for the validity of the information processing

account of motive arousal and the goal imagery technique derived from it. As Figure 3 shows, it was only among goal-imagery participants that implicit power motivation and activity inhibition combined in the expected manner to predict observers' assessments, with participants high in both variables being judged to have given the most persuasive presentation of all participants. In contrast, we did not obtain similar or substantial effects of personality variables on judged persuasiveness for participants in the relaxation group.

We were also able to identify behaviors that mediated the effect of participants' personality dispositions on judged persuasiveness in the goal-imagery group. Specifically, individuals with an inhibited power motive were judged to be highly persuasive because they spoke more fluently, were more likely to raise their eyebrows and gestured more than most other participants. These findings are in line with past research identifying these behaviors as effective peripheral indicators of the importance and persuasiveness of a message (e.g., Mehrabian & Williams, 1969; Miller, Maruyama, Beaber, & Valone, 1976). Notably, we did not find any substantial effects of participants' implicit motives on the verbal content (e.g., the number or extremity of arguments presented) of their presentations.

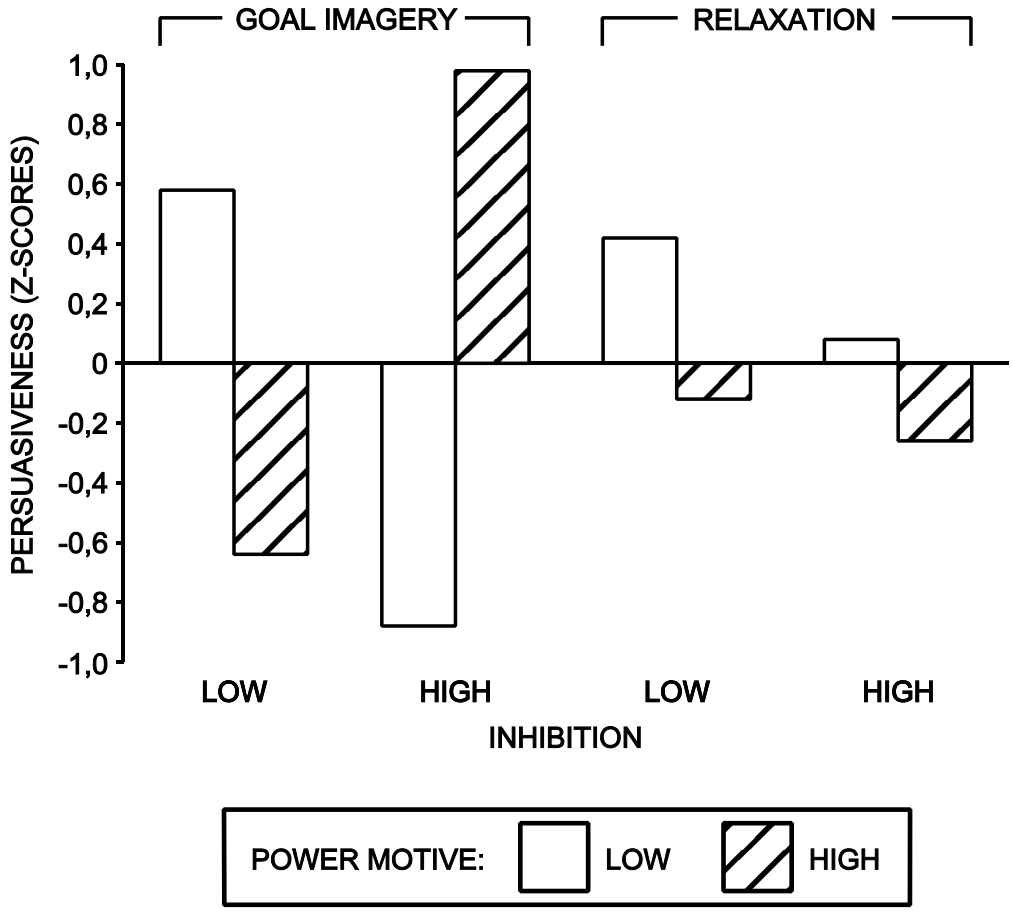

Figure 3. Regression-estimated persuasiveness ratings as a function of experimental condition (goal imagery vs. relaxation), power motive, and activity inhibition for values 1 SD above (high) or below (low) the means of the personality variables. From: Schultheiss, O. C., & Brunstein, J. C. (in press b, pending on revisions). Inhibited power motivation and persuasive communication: A lens model analysis. Journal of Personality.

Although such an influence might still be detected using more fine-grained measures of message content, this finding is fully compatible with and provides additional evidence for the notion that implicit motives operate at a nonverbal, experiential-expressive level.

Thus, the results of this study not only corroborate the general finding of the previous two studies that assigned goals can engage individuals' implicit motives only once they have been translated into an experiential format through goal imagery, but also demonstrate that the goal imagery technique can be used successfully to study the effects of implicit motives on complex and subtle social behavior in the laboratory. Since the predicted results of motives on dependent measures have never been obtained in the various control conditions of studies 1 through 3, I decided at that point to employ the goal imagery technique as a basic tool to get at individuals' implicit motives in my subsequent research.

Study 4: Personalized power motivation and testosterone changes in response to imagined success in a competition

The primary aim of this study was to test the hypothesis that the steroid hormone testosterone may represent a substrate of power motivation reward. More specifically, we (Schultheiss, Campbell, & McClelland, 1999) predicted that individuals with an egoistical-assertive power motive (called personalized power or p Power) should show a testosterone increase in response to winning a competition against an opponent, whereas no such increase should be observable in winners lacking this type of power motivation or losers in general. The results of this study supported these assumptions, but more pertinent to the issues discussed in this chapter, they also provided evidence that goal imagery can have a direct effect on hormones.

Before participants (42 male students) competed against each other on a paper-and-pencil speed task in a one-on-one contest situation, they were first assigned the goal to beat their opponent in the contest and then listened to a goal imagery exercise which described the contest from the winner's perspective (cf. Table 1). Testosterone levels were assayed from saliva samples collected at the beginning of the session and immediately after the goal imagery exercise was over, but before the actual contest started. Regression analyses revealed that while among individuals showing signs of socialized power motivation (s Power), which is thought to act as a check on personalized power concerns, p Power was not associated significantly with testosterone changes from before to after the goal imagery exercise, higher levels of p Power strongly predicted increases in testosterone in no-s Power participants (see Figure 4).

For lack of a non-imagery control group in this study, I cannot rule out that these changes in hormone levels may have been caused fully or in part by the experimenter's instructions before the goal imagery excercise. However, the persistent failure of verbal goal assignments to arouse implicit motives in control-group participants in the previous studies makes this an unlikely conclusion and strongly suggests that it was the goal imagery exercise and not the preceding instructions by the experimenter that instigated the observed motive-hormone relationships. To the extent that the results of this study can be interpreted as an extension of the previous findings, then, they make a compelling case for the efficacy of goal imagery to engage ES processing of a goal, because they demonstrate that goal imagery can affect the endocrine system, which is a major output of the ES, but not of the VSS.

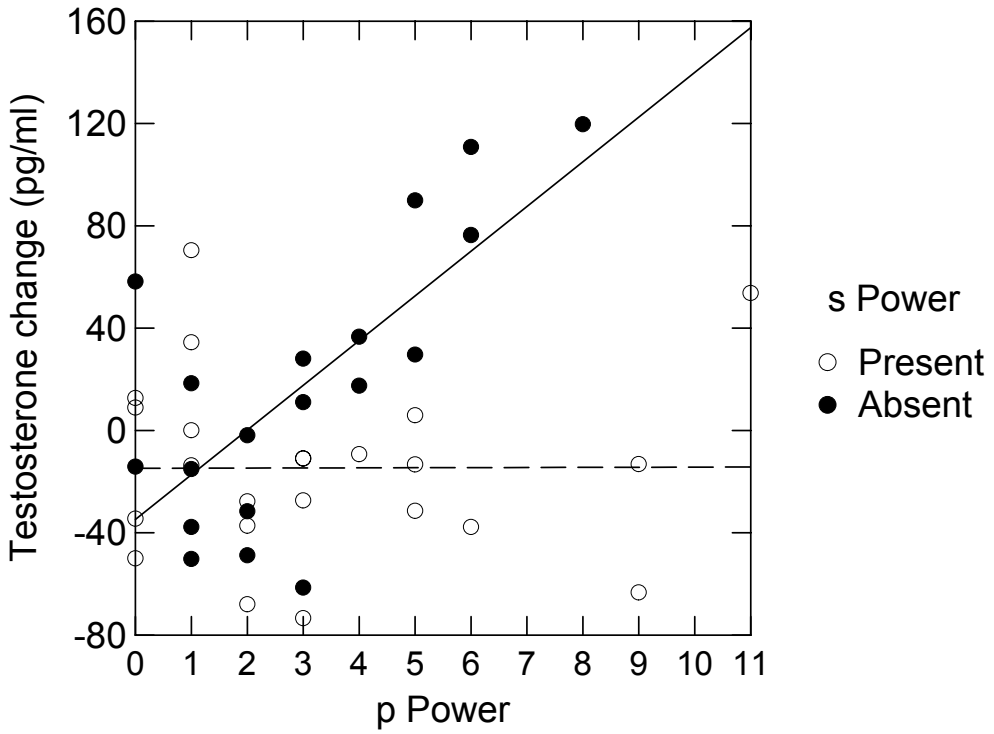

Figure 4. Residualized changes in salivary testosterone (post-imagery minus baseline) as a function of s Power (present vs. absent) and p Power. From: Schultheiss, O. C., Campbell, K. L., & McClelland, D. C. (1999). Implicit power motivation moderates men's testosterone responses to imagined and real dominance success. Hormones and Behavior, 36(3), 234-241.Copyright (c) 1999 by Academic Press. Adapted with permission.

Summary and Conclusion

Taken together, the results of these four studies consistently demonstrate that it is only after verbally assigned goals have been converted to an imagistic-experiential representational format that they can interact with implicit motives to shape a person's motivation, performance and psychophysiological responses. Without goal imagery, and even despite clear-cut and detailed verbal descriptions of the motivational incentives associated with them, goals do not per se arouse an individual's implicit motives. At a more general level, these findings also support the distinction between a verbal-symbolic and an experientially driven information processing system. At a minimum, they suggest that under circumstances in which the verbal-symbolic system (VSS) deals with information pertaining to future states and actions, VSS and experiential system (ES) functioning are prone to become dissociated, because the ES continues to process features of the immediate environment and present situation, and that a realignment between the two systems requires an active effort to translate the content of one system into the format of the other. Finally, the results of these studies may help dissipate some of the concerns that Klinger, Lazarus and others have raised about the validity of implicit motive measures and better understand why researchers in the past may often have failed to obtain predicted motive-behavior relationships in experimental studies. I believe that it is one of the strengths of the present account that null effects and substantial and meaningful effects of motives on a variety of measures can be obtained side by side within one and the same study, which shows that presenting motivational incentives in the right format can make all the difference for success or failure in

experimental research on implicit motives. I therefore suggest that the goal imagery technique described here may represent a valuable tool that researchers can use to study implicit motives en detail even in laboratory experiments which typically rely strongly on verbal instructions and experimenter-assigned behavioral goals.

Coda: Between-systems independence and communication

In closing, I would like to return to the independence between the VSS and the ES once more. Throughout this chapter, I have emphasized that these systems differ in the kinds of information they process and the degree to which their inputs, operations, and outputs are reflected in a person's consciousness. Yet guided goal imagery, which after all relies on verbal language for instructing a person about what to imagine, has the power to bring the VSS in contact with the ES. Does this contradict the notion that the ES does not deal in verbal symbols or that the ES and the VSS are independent by virtue of their design and their origins?

I believe that this is not the case. As Paivio's (1986) research on verbal and nonverbal information processing shows, experiential stimuli always have an advantage over words when it comes to evaluating the valence or emotional meaning (and many other attributes) of a stimulus. Although this effect may be less pronounced for concrete words (like the ones that were used to construct the goal imagery scenarios in the studies described above) than for abstract words, it is robust and never completely abolished. According to Paivio, it is due to the fact that the processing of words for emotional meaning involves an active translation of a word into an imagistic format and thus requires additional time – time that is not needed for the processing of experiential information. Thus, to the extent that verbal language is highly concrete, it may help build a bridge from the VSS to the ES, but it still requires an extra effort to cross that bridge. I suspect that such active bridge-building efforts are more the exception than the rule in everyday life and depend on training and an awareness of its value. In order to efficiently coordinate our activities with others, we usually prefer highly condensed symbolic shortcuts to represent and communicate our goals and intentions and leave it to professional writers of fiction to delight us with the art of using concrete and epic language to evoke mental images and emotional experiences. Likewise, we also comparatively rarely make an effort to build bridges from the ES to the VSS and attend and carefully name the sensations, impulses, and emotions generated by the ES. According to the position presented in this chapter, the VSS has not developed to fulfill this function in the first place, neither phylogenetically nor ontogenetically. It therefore may require an active educational effort to train children in accurate "reading" of the ES and thus to make them emotionally and motivationally literate (cf. Buck, 1983).

In adulthood, people may differ intra- and interindividually from each other in their ability to build such bridges due to differences in their socialization, their neurobiological setup, but also because of situational factors (see Bucci, 1995, for a measure of inter- and intraindividual variations in cross-modal connections). It is an intriguing but unexplored possibility that the better "bridge-builders" may also show a higher degree of correspondence between their implicit motives and their personal goals or explicit needs, or that goals that are represented in a person's mind as images and experiential scenarios are more likely to be congruent to the person's implicit needs than those that are coded in a primarily verbal format. The same idea, if applied to the TAT as the quintessential measure of implicit motives,[3] could mean that the motive scores of individuals who write very

concrete and "visceral" TAT stories may be more valid indicators of their underlying needs than of those who write comparatively abstract and "brainy" stories. However, these ideas remain to be tested empirically.

All in all, I am firmly convinced that the implicit motive construct has suffered undue neglect in recent times, and that a better understanding of the nature and conditions of implicit motivational processes can open up new and fruitful avenues for research in motivational psychology. I hope that the information processing account presented here contributes to this goal and may help resolve some crucial issues and persistent problems in the study of implicit motives.

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Acknowledgment

I would like to thank Kent Berridge, Joachim Brunstein, Martin Maehr, Bill McKeachie, Paul Pintrich, and Wendy Treynor for their helpful comments and suggestions on an earlier draft of this mansucript. The studies reported in this chapter were conducted while the author was supported by a doctoral stipend from the Studienstiftung des deutschen Volkes and by postdoctoral grants from the Deutsche Forschungsgemeinschaft (SCHU 1210/1-1, 1-2, 1-3). Correspondence concerning this chapter should be sent to Oliver C. Schultheiss, Department of Psychology, 3241 East Hall, 525 East University Ave., University

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Footnotes

[1] Like the present theoretical account, Bargh and Ferguson's (2000; see also Bargh & Chartrand, 1999) model of controlled and automatic processes in goal-directed behavior emphasizes the fact that behavior can be triggered by environmental stimuli without the intervention of conscious volitional acts. However, Bargh and Ferguson base their conclusion on a body of research which typically involved activating individuals' verbally represented self-concepts and goals by external cues (usually words) and studying their effects on behavior. Thus, this research essentially demonstrates that the verbal-symbolic system can be triggered automatically and nonconsciously and that not all of its operations occur in a controlled fashion, a point that I do not debate. In contrast to their position, though, I contend that implicit motives are fundamentally distinct from verbally represented goals or self-schemata because they are represented nonverbally and usually do not show up in individuals' views of themselves or their goals. I should also point out that the conscious/nonconscious-distinction may not be the most critical one for differentiating implicit motives from other personality constructs. The more basic issue is, in my view, the independence between (or lack of fit of) an evolutionarily new system, which specializes on coordinating the individual's behavior with others' behavior through the use of symbolic language, and a more ancient system, which guides the organism's behavior based on experiential information processing.

[2] In this study, as well as in Study 3, there is actually some evidence that without goal imagery, the power motive tends to be a negative predictor of power behavior, partly because individuals low in power motivation actually show more power behavior than those high in power motivation in their group or those low in power motivation in the goal imagery group. Although these trends never became significant in any single study, they come up consistently enough across studies (see also Spangler, 1992, for related results for the achievement motive) to require some explanation. I suggest that very low levels of a motive, especially when obtained with TAT pictures that have a considerable pull for this motive, reflect not just an indifference towards the motive's incentive, but may actually indicate a considerable level of fear or avoidance of the incentive (for related arguments, see Atkinson, 1957; Fenz & Epstein, 1962; Scott, 1956). In the case of the power motive, such a fear of having impact may be the result of early punishment for assertive behavior (cf. McClelland & Pilon, 1983) and, perhaps as a consequence of such punishment, be associated with increased obedience and conformity. This might explain why low-power individuals in this and other studies seemed to be relatively eager to follow the experimenter's instructions when they had not imagined the pursuit and attainment of the power incentive associated with the assigned goal, but seemed to shrink away from executing those instructions after realizing, by means of the goal imagery exercise, that the goal was to have impact on others. Clearly, however, these issues merit further research.

[3] Although the TAT procedure relies on individuals' verbal reports of their fantasies, I would like to point out that this does not necessarily contradict the main hypothesis presented here, namely, that implicit motives operate at the experiential, not at the verbal-symbolic level. The position taken in this chapter, namely that the VSS, but not the ES, is activated by and processes verbal symbols, does not rule out that spoken language as an instance of the behavioral output of information processing can be influenced both by the VSS and by the ES. However, whereas language should be primarily VSS-driven in response to verbal stimuli, particularly if aimed at the content of the VSS such as a person's self-schemata, goals, and other forms of declarative knowledge, and characterized by a self-reflective, declarative quality, it should be primarily ES-driven in response to nonverbal stimuli, particularly if they are in some way emotionally or motivationally arousing, and express the behavioral impulses elicited by the impinging stimuli. TAT stories clearly belong to this second category, and the way language is used in telling a TAT story has little to do with how it is used when a person is describing her or his personality, aspirations and motivations. Moreover, while in VSS-driven language the semantic content and self-relatedness of a message (i.e., self-reported preferences, attitudes, goals, etc.) are the important features and not necessarily the frequency with which the message is conveyed, it is precisely the frequency with which a particular concern shows up in language, typically in the absence of any reference to the self, that characterizes ES-driven language and which is assumed to be an index of the strength and thus arousability of an underlying motive disposition. Most researchers therefore assume that counting motive images in a person's TAT stories is equivalent to measuring the frequency of the person's motivational impulses in response to a particular situation (e.g., Atkinson & Birch, 1970; see also Cramer, 1999). This point of view has been summarized by Heckhausen (1968): "[...] we regard the apperception of a TAT picture situation – and the weaving of a story or plot in response – as operant behavior in a kind of miniature life situation." (p. 110)..