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Beyond Verbal Self-Report: Priming Methods in Relationship Research

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How do we know in advance that our partner will soothe us when we are sad or that our child will like a birthday present? Sure, we are not always correct, but we do fairly well in predicting the behavior of relationship partners. This capacity is due to a mental representation of personal relationship that has been termed *internal working model* in attachment theory (Bowlby, 1969), or *relational schema* in a more general perspective on relationship representation (Baldwin, 1992). Because relationship research traditionally relies on behavior observation and verbal self-report data, the cognitive representation of relationships has mainly had the status of a postulated background concept and has not been an object of investigation in its own right. This has changed since the 1990s when relationship researchers became increasingly interested in using experimental methods such as affective and semantic priming to study relational schemata. In this chapter I review this work and some of its historical precursors. The aim is to show how priming has been successfully used in relationship research, to discuss the limitations of this approach, and to make some suggestions for future research.

According to Baldwin's (1992) conceptualization of the relational schema this knowledge structure is composed of three distinct parts: relationship-specific representations of the relationship partner, the self, and the interaction between them. Relationship experiences are stored in this knowledge structure not as a record of the historical truth, but as they were seen, interpreted, and memorized by the individual. Based on these stored past experiences the relational schema can be used to simulate interaction

sequences in order to predict reactions of the partner. In happy relationships the relational schema provides continuity, security, and trust. Also malfunctioning relationships are reflected in the relational schema. Of course, if the representation of the relationship partner and his or her expected behavior are unrealistic, the relational schema can lead to dysfunctional interactive behavior.

THREE APPROACHES TO STUDY RELATIONAL SCHEMATA

There is a limited number of ways to study the general structure and individual differences in the content of relational schemata. One can observe relationship partners when they interact, one can ask people about their relationships, or one can access the relational schema using experimental methods. All three approaches allow only for indirect inferences about relational schemata, each has specific virtues, problems, and limitations.

Behavior observation has been extensively used to study infant–parent relationships in preverbal infants (Ainsworth, Blehar, Waters, & Wall, 1978) and children up to age 6 (Main & Solomon, 1986). Although this research tradition has resulted in an elaborate theory of mental representation, different types of relational schemata (i.e., working models) were inductively inferred from typical patterns of behavior in mother–child interactions (e.g., of secure, avoidant, and anxious-ambivalent children). However, it seems difficult to use behavior observation alone to empirically test predictions about the structure and content of relational schemata.

The most commonly used method in relationship research is the *explicit* verbal self-report. There is compelling evidence that this approach is an economical, efficient, reliable, and fairly valid way to study relational schemata. However, *explicit* verbal self-reports of relationship quality are often distorted by positive self-presentation, and they are limited to features of relationship quality that can be consciously accessed and verbally reported. These problems can be circumvented using *indirect* verbal self-report measures such as the Adult Attachment Interview (AAI, George, Kaplan, & Main, 1985). In the AAI it is not the content, but rather the relation between content of the interview and formal characteristics, such as incoherence, lack of detail, or inappropriate affect, that are used to infer attachment-specific features of the relational schema. This approach bears many similarities to the diagnosis of the veridicality of eye-witness testimonies used in forensic psychology (e.g., Lamb, Sternberg, & Esplin, 1994; Trankell, 1971). Although based on verbal reports, both approaches are intended to assess mental representations in a way that is robust against voluntary or involuntary distortions of the verbal account. The major disadvantage of the AAI and similar interview techniques is that they are extremely time-consuming.

Finally, the third approach uses experimental methods and response time measures to make inferences about the structure and content of mental representation of relationships. Although the experimental toolbox contains several potentially suitable experimental paradigms such as the Stroop-task (McLeod, 1991), the affective Simon task (De Houwer & Eelen, 1998; De Houwer, Hermans, & Eelen, 1998) or the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998; see also De Houwer, chap. , this volume), almost all research reviewed here used various priming paradigms. Priming is a standard method in cognitive psychology and has recently attracted growing interest also in social psychology as an implicit measure of attitudes, stereotypes, and prejudice (e.g., Devine, 1989; for an overview see Brauer, Wasel, & Niedenthal, 2000). More interesting, the first studies using priming of relational schemata date back to the 1960s (Silverman & Silverman, 1964), and built on the "New Look" research tradition of the 1940s rather than the development of priming methods in cognitive psychology (e.g., Meyer & Schvaneveldt, 1971; Neely, 1977).

PRIMING IN RELATIONSHIP RESEARCH

Rationale of the Priming Method

Priming approaches are attractive in the context of relationship research because they may circumvent the two critical problems of verbal report measures, namely their reactivity and limitation to information that can be consciously accessed and verbalized. The term *priming* is used for a broad class of experimental techniques that are used to study the effects of the activation of a specific mental content on subsequent behavior. In general it is assumed that mental representations are organized in some form of associative network. According to such network models, the activation of one node spreads to other nodes as a function of association strength and the distance between nodes. If a node of the network is pre-activated or *primed* by activation spreading from a connected node, it is easier to activate this node subsequently. The facilitation of activating a target concept (or node) can be measured by shortened response latencies or reduced error rates as compared to priming with unrelated concepts or no priming at all. Taking advantage of this basic effect, the priming method uses measures of response facilitation to draw inferences about the content and structure of the associative network.

Priming effects are generally conceived of as reflecting automatic processes (i.e., processes that unfold without requiring awareness), intentionality, or the allocation of attentional resources. Although the behavior that is influenced by the priming can be controlled in principle, priming effects in well-designed experiments are unlikely to be controlled because partici-

pants are unaware of the priming or of the relation between the priming and its effects on subsequent behavior (Bargh, 1994).

There are very different methods to activate a specific mental content. These range from procedures that require the active participation of the participant, such as writing down a story (e.g., about rejecting versus supportive friendship experiences, Miller & Noirot, 1999), imagining a supporting versus critical significant other (Baldwin, 1994), or resolving a scrambled sentence task, in which grammatically correct sentences have to be built by choosing four words out of sets of five. If many scrambled sentences contain words relating to the target concept, an unobtrusive priming of this concept can be achieved (Bargh, Chen, & Burrows, 1996; Higgins, Rholes, & Jones, 1977). When using these approaches, care is taken that participants are unaware about the influence of the priming on subsequent behavior by using a cover story that makes it plausible that the priming task and the subsequent task belong to different experiments or are unrelated.

In other approaches, pictures, names or words are presented as primes using a tachistoscope or a computer monitor. The priming procedure can take place before the subsequent task (e.g., Bornstein, Leone, & Galley, 1987), or primes and subsequent task can be presented intermixed (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). To make certain that controlled cognitive processes cannot influence priming effects, targets are presented very shortly after the onset of the prime (e.g., 300 ms), or primes are presented outside of conscious awareness or *subliminally* (*lat.* for "below threshold"). Priming procedures are called subliminal if primes are presented above an objective perception threshold evidenced by an experimental effect of the primes, but below a subjective perception threshold evidenced by ". . . the person's own report of a lack of phenomenal experience of the stimulus" (Bargh, 1992, p. 237), or the incapacity to recognize primes in a direct discrimination task (Cheesman & Merikle, 1986; Greenwald, Draine, & Abrams, 1996; Merikle & Reingold, 1992). More interesting, it has been found often that supraliminal priming produces similar results as subliminal priming. According to Bargh (1994) the crucial point is *not* whether or not participants are aware of primes, but whether they are aware of a possible influence of primes on subsequent behavior. The use of subliminal priming is just an elegant method to eliminate any suspicion that priming effects are influenced by conscious or deliberate cognitive processes.

Three Research Programs

Empirical studies that have used priming methods to investigate the mental representation of relationships can be grouped into three categories. A first line of research has investigated the effects of a subliminal activation of relational schemata on very global outcome measures such as therapy success.

A second line has used the priming method to study the architecture of relational schemata, as well as the connections between relational schemata and other constructs, such as the self-concept, self-esteem, mood, or coping behavior. In a third approach affective priming has been used as a nonreactive, indirect or implicit *measure* of relational schemata (e.g., Banse, 1999; 2001). This approach is conceptually akin to priming methods for assessing implicit attitudes or prejudices (e.g., Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Fazio, Jackson, Dunton, & Williams, 1995; Wittenbrink, Judd, & Park, 1997).

SUBLIMINAL PSYCHODYNAMIC ACTIVATION

Somewhat surprisingly, the historically earliest and, up to now, largest research program using subliminal semantic priming in the context of personal relationships is rooted in psychoanalysis and has been conducted in a clinical context. Silverman and Silverman (1964) presented a subliminal psychodynamic activation (SPA) method to experimentally test hypotheses derived from psychoanalytic views of psychopathology. Although this research program has produced an impressive number of studies its impact has been limited. Both relationship researchers and scholars of unconscious cognition have been reluctant to accept the results of this research as empirical facts. This skepticism was probably raised by both ". . . the lack of widespread enthusiasm for the SPA result's proposed psychodynamic interpretation" (Greenwald, 1992, p. 769), and perhaps more important, by the very unusual methodological approach using entire sentences as primes in a subliminal priming procedure. In an informal opinion survey among experts in unconscious cognition (Greenwald, 1992, Appendix B), only a small minority considered the claimed subliminal psychodynamic activation as empirically established.

The evaluation of the empirical status of SPA research could not be more contradictory. Hardaway (1990) presented a meta-analytic review of SPA studies that confirmed a significant SPA effect and concluded somewhat apodictically "Future research designed to replicate basic experimental effects is deemed superfluous" (p. 177), whereas Fudin (1999) raised serious concerns about the internal validity of SPA experiments and underscored ". . . the need to start anew research in this area" (p. 234). So not only the psychoanalytical explanation of subliminal psychodynamic activation, but also the mere existence of the SPA effect have been contested.

According to psychoanalytic theorizing, many adults harbor fantasies to be one or to merge with the comforting, protective, and nurturing "good mother of early childhood" (Silverman & Weinberger, 1985). In a therapeutic setting SPA is claimed to activate such fantasies and to enhance the beneficial effects of the therapy. In typical SPA experiments, the sentence

"Mommy and I are one" is presented repeatedly by a tachistoscope for 4 ms during one or several therapeutic sessions, and a neutral sentence such as "People are walking" is used as a control prime in another session. The priming procedure is double-blind; The experimenter does not know whether the experimental or the control prime is used, and the patient is unable to consciously recognize the prime due to the short exposure time. The priming effects have been assessed using pre–post treatment difference scores in various measures including ratings of psychopathology, well-being, projective tests, smoking abstinence, physiological reactions, or behavior accuracy measures. Most studies have been conducted with participants diagnosed as schizophrenics, other studies included depressive, phobic, or nonclinical samples.

In his meta-analysis Hardaway (1990) reviewed 56 studies containing results of 111 independent samples. Besides the prime sentence "Mommy and I are one" other sentences relating to the mother were used (e.g., "Mommy and I are two", "Mommy feels fine"), and also stimuli that alluded to oneness but did not contain the word *Mommy* (e.g., "my girl and I are one," "Daddy and I are one"). Besides the type of stimuli and the number of priming repetitions, Hardaway coded several potential moderator variables such as sample characteristics, methodological quality, and the laboratory affiliation of the authors.

The effect size of the "Mommy and I are one" primes as compared to control primes was significant and of moderate size ($d = .41$). The effect size for other Mommy stimuli ($d = .14$), and other oneness stimuli ($d = .22$) was still significant but substantially smaller. This result suggests that the "Mommy and I are one" primes activated a specific relational schema and elicited particularly strong effects for primes related to mother *and* oneness. The remaining variance between studies could be attributed to sampling error and the unreliability of measures. No significant influence was found for the researcher's laboratory affiliation or the other potential moderators. Virtually identical results were reported in published and unpublished studies (Weinberger, 1992), and a file-drawer analysis revealed that 2,237 more unpublished studies with zero-effects would be needed to attribute the overall effect to a publication bias for significant results. In another meta-analysis, Bornstein (1990) showed that for patients subliminal priming had significantly larger effects than supraliminal priming, whereas no difference was found for normal controls. Hardaway (1990) stated that experimental effects were also found for normal controls, but unfortunately failed to report the corresponding effect sizes. However, the results of Hardaway's meta-analysis provide evidence that the prime "Mommy and I are one" did positively influence the outcomes of therapeutic and educational interventions, and that the effect sizes of studies were independent of the author's affiliation to Silverman (but see Fudin, 1999).

The most interesting result of the meta-analysis was that the sentence "Mommy and I are one" had more positive effects than primes relating either to Mommy or to oneness. But how is it possible that some extremely brief exposures of a sentence can influence molar constructs such as therapy effects? Weinberger (1992) tried to demystify SPA-results by relating them to accepted phenomena of contemporary mainstream psychology. He proposed that the moderation of therapy effects by subliminal priming may be mediated by a positive mood induction, leading to more flexibility in thinking, better problem solving, and eventually to more positive therapy outcomes (but see Sohlberg, Samuelberg, Sidén, & Thörn, 1998). Weinberger maintains that the genuine psychoanalytic contribution to SPA-effects is the identification of potent stimuli. In fact, whereas one does not need to adhere to psychoanalytic theorizing to accept the word *Mommy* as positive, hardly any other theoretical framework would predict *oneness* to be a potent positive stimulus. This fact may be partly responsible for the vivid scepticism SPA-results have encountered outside the psychoanalytic community.

In this respect a recent study by Glassman and Andersen (1999) is particularly interesting. In this study subliminal multiple word primes were used to activate relational schemata of significant others without referring to psychodynamic assumptions. The primes were short descriptions of significant others (e.g., is usually very insightful, gets depressed sometimes, is very sensitive) that had been generated by the participants at least 1 week before the priming session in an allegedly different experiment. A series of such describing sentences were briefly (71 to 100 ms) presented in parafoveal vision during a mock interactive computer game with a fictitious second person. A subsequent forced choice discrimination task showed that the prime sentences were indeed presented outside of awareness. As in previous research using written person descriptions of significant others (Andersen, Glassman, Chen, & Cole, 1995), participants erroneously assigned attributes of the significant other to a fictitious person who shared some descriptors with the significant other. This was the case although the critical traits were *not* used for priming. This result suggests that the entire significant other schema was activated and then used "to go beyond the information given" about the fictitious interaction partner. Less false positive memory was found in two control groups who were subliminally primed either with descriptions of nonsignificant others, or someone else's significant others. Overall, these results provide strong evidence that schema effects can be attributed to the mental representation of significant others, and not to the self-generation of primes, or specific features of significant-other descriptions.

The results of Glassman and Andersen (1999) have several important implications. First it is noteworthy that the psychoanalytical concept of

transference can be empirically demonstrated and explained as a "normal" schema effect that can occur with any significant other even if the significant other schema is activated outside of awareness. Second, in two experiments, subliminally presented four-word sentences elicited specific and theoretical meaningful effects. Unlike the "Mommy and I are one" prime in SPA research no controversial theoretical assumptions are required to interpret the observed priming effects. The idiographic prime sentences generated by the participants can be straightforwardly interpreted as a readout of individual relational schemata. However, the basic problem of the complexity of the used primes remains. Is it plausible that subliminally presented sentences can be processed? Greenwald (1992) noted that nothing more complex than "a partial analysis of the meaning of single words" has been empirically established, but that "the task of demonstrating that attentionless unconscious cognition can extract the meaning of a two word sequence poses a theoretically significant challenge (p. 775)".

Unfortunately up to now there is little systematic research taking up Greenwald's "two word-challenge". Draine (1997) and Greenwald and Liu (1985, cf. Greenwald, 1992) found no evidence that subliminal two-word primes had any sentence level priming effects over and beyond the additive effects of individual prime words. However, it may be possible to reconcile the controversy about multiple word primes. I return to this point at the end of this chapter.

EXPLORING THE STRUCTURE AND CONNECTIONS
OF RELATIONAL SCHEMATA

Role Schemata, Relational Schemata, and Self-Esteem

A second research program using subliminal priming for studying the structure and connections of relational schemata has mainly been conducted by Mark W. Baldwin and colleagues. These authors have published a series of studies that have explored the effects of chronic individual differences or temporal experimental activation of relational schemata on several cognitive and affective constructs such as the self-concept, self-esteem, anticipated partner reactions, or reported mood and coping behavior during an imagined stressful event.

In an initial study, Baldwin, Carrel, and Lopez (1990) aimed to demonstrate that the cognitive representation of an authority figure can be unobtrusively activated using a subliminal priming procedure, and that the person schema can have a specific effect on the self-concept in an academic context. The experiment began with asking advanced students in psychology to note several research ideas. They then performed a mock reaction

time task that consisted in pressing a button as quickly as possible after seeing a light flash before they had to evaluate the quality of one of the previously noted research ideas. The light flash was in fact the picture of the scowling face of a familiar academic authority (Robert Zajonc), the face of a friendly looking postdoctoral fellow, or a blank control slide.

The primes were repeatedly presented for 2 ms and immediately followed by a pattern mask for 10 ms in a fully double blind experimental procedure. The results showed that a subliminal priming with the disapproving face of the academic authority elicited more negative self evaluations than a priming with the friendly face of the research assistant. Although this result confirmed the hypotheses, it did not exclude the possibility that the effect was caused by the facial expressions rather than the social roles of the persons. This point was addressed in a second experiment with catholic female students not familiar with Robert Zajonc. After having read a text describing a sexual dream implying a woman's permissive attitude toward sexuality, the participants were subliminally primed with either the picture of the disapproving Robert Zajonc, a photo of an equally disapproving Pope John Paul II, or a blank control slide. Additionally the participants were asked to describe themselves as "nonpracticing" versus "practicing" Catholics.

As expected, those subliminally primed with the disapproving face of the Pope reported a more negative self concept, and this effect was found only for participants who described themselves as practicing Catholics. The data show that a negative expression *combined* with the status of an authority (academic or religious) was sufficient to lower self-esteem, but not a negative expression alone. In a follow-up study, Baldwin (1994) investigated whether the self-concept lowering effect of common authority figures would generalize to individually chosen significant others. Participants were asked to provide the names of a number of persons including an accepting and a critical significant other that were then used as subliminal primes. After the priming, participants were surprisingly asked to remember and to write down the items presented in a prior incidental learning task, which was much more difficult than expected. Measures of mood, self-esteem, and a self rating on the performance in the memory-task were assessed. The results showed that the self-esteem scores were significantly lower after priming with the individual names of *critical* persons than after priming with the names of *accepting* persons. No effect was found for the self-evaluation of performance or the mood-scales. The latter null-finding made it unlikely that the priming effect of significant other names was mediated by a mood induction, thus suggesting that relational schemata are directly linked to the representation of the self and self-esteem, and not indirectly via affective processes. To investigate whether subliminality was critical for obtaining the observed priming effects, the name of a critical or a supportive significant other was presented supraliminally in a second experiment. Additionally, a

self-awareness manipulation was introduced by using a mirror besides the experimental computer that was turned to the participants for half of the sample, and turned away for the other half (Carver & Scheier, 1981), inducing high or low self-awareness, respectively.

Previous research had shown that supraliminal primes have a stronger influence on self-aware participants (Baldwin & Holmes, 1987), and that supraliminal primes yield assimilation effects when presented incidentally, but contrast effects when focused upon (Strack, Schwarz, Bless, Kübler, & Wänke, 1993). In consequence, it was expected that the analysis of self-esteem would show an interaction effect between the factors self-awareness and type of significant other. Only under conditions of high self-awareness should a critical other lower self-esteem. This predicted interaction effect was in fact marginally significant. In the high self-awareness condition (with mirror) self-esteem significantly decreased in the critical other condition, and no significant effect was found for the accepting other condition. In the low self-awareness condition, an opposite trend was found that was presumably due to an overcompensation of the priming effect. In this experiment the manipulation also influenced mood, but a mediation analysis revealed that the effects found for self-esteem remained marginally significant when controlling for mood. The observed cross-over interaction between self-awareness and critical versus supportive relationship underlines the virtue of the subliminal priming technique. Although supraliminal primes may have similar effects as subliminal primes (Bargh, 1994), this is only to be expected if participants are not aware of a possible influence of the prime on subsequent behavior, which is guaranteed if primes are presented outside of awareness.

Navigating in the Social Space: Predicting Behavior of Relationship Partners

The stored knowledge about the partner, the self, and past interaction patterns between them open a mental theater, in which own actions and partner reactions can be simulated. Attachment theory (Ainsworth et al., 1978; Bartholomew, 1990; Bowlby, 1969; Collins & Read, 1994) provides an elaborated theory of different types of internal "working models" or relational schemata. For example, as compared to secure individuals anxious-ambivalent individuals are characterized by a strong need for closeness and the expectation to be rejected when searching for closeness. This characteristic should be reflected in relational schemata containing corresponding *if–then* contingencies that link own actions to expected partner responses. Baldwin, Fehr, Keedian, Seidel, and Thomson (1993) conducted an elegant study showing that the experimental cognitive approach is in fact a viable method to reveal specific features of relationship representations by using explicit and implicit approaches in parallel.

It was expected that individuals with secure attachment would indicate more optimistic interaction expectations than insecure individuals. Explicit interpersonal expectations in a romantic relationship were measured in three different contexts (trust, dependency, and closeness) using sentences such as "You want to spend more time with your partner . . .". The participants then indicated the frequency of positive (. . . he/she accepts you) and negative outcomes (. . . he/she rejects you).

As expected, anxious-ambivalent individuals reported more negative expectations in the domains of trust and closeness seeking (but not dependency), and avoidant individuals reported more negative expectations in the trust domain. However, these results could be accounted for by individual differences in social desirability or by semantic overlap between reported interpersonal expectations and attachment measures. In a second experiment, these alternative explanations were eliminated by using a lexical decision task to assess interpersonal expectancies. To prime specific interpersonal contexts, sentences were displayed word by word (600 ms each), followed by targets that had to be classified as words or nonwords. As expected, secure individuals responded relatively faster to words denominating positive, and avoidant individuals relatively faster to target words denominating negative partner behavior (the number of anxious-ambivalent participants was not sufficient for analysis). This result is important for attachment theory because it shows that different adult attachment styles are indeed characterized by specific if–then contingencies at the representational level. From a more general perspective it is noteworthy that the priming with the interpersonal contexts facilitated specifically lexical decisions for those target words that represented probable partner behaviors for each attachment style and not just relationship unspecific semantic proximity between primes and targets.

Interpersonal Expectancies and Self-Esteem

Many theories ranging from symbolic interactionism (Cooley, 1902; Mead, 1934) to recent functional accounts of self-esteem (Leary, Tambor, Terdal, & Downs, 1995) have postulated that individual differences in the self-concept and self-esteem reflect the individual's perception of evaluations by significant others. The self is not a homogeneous construct and can be better described as composed of several specific selves (e.g., social, academic, sport, etc.) with corresponding specific self-esteem (Marsh, 1993; Marsh & Yeung, 1998; Pelham & Swann, 1989). In extending the approach described previously, Baldwin and Sinclair (1996) investigated the often postulated relation between interpersonal contingencies and self-esteem in the context of success and failure. Individuals with low self-esteem were expected to have a chronically accessible relational schema in which success is

associated with acceptance, and failure with rejection. Individuals with high self-esteem, however, should instead by default expect unconditional acceptance.

In analogy to the study reported previously, Baldwin and Sinclair (1996) postulated that the representation of an individual's own behavior (related to success and failure) should be connected to the representation of responses of the social environment (acceptance vs. rejection) in relational schemata. To prime the first part of these *if–then* contingencies, Baldwin and Sinclair (1996) used words relating to success (e.g., success, win), failure (e.g., lose, incompetent), or control words (begin, estimate). To assess the automatically expected reactions, target words relating to acceptance (e.g., cherished, accepted), rejection (e.g., abandoned, ridiculed), neutral words (e.g., listened, hammer), and nonwords (e.g., lisrened, hammen) were used. A self-esteem measure was obtained and the sample was split at the median in a low and high self-esteem group. As expected, individuals with low-self esteem showed faster responses to rejection targets after failure primes than after success primes.

Because success and failure primes and acceptance and rejection targets are affectively polarized, the results may have been caused by a valence congruency effect (positive primes speed up responses to positive and negative primes to negative targets), making the assumption of a mediating relational schema superfluous. This alternative explanation was excluded in a second experiment by showing that priming effects were specific to interpersonal words and did not occur for other valenced words (e.g., freedom, amuse vs. stealing, decay).

Many developmental theories of self-esteem postulate that self-esteem is shaped by many episodes of acceptance or rejection by significant others contingent on success and failure (e.g., Leary et al., 1995; Rogers, 1959). If this conjecture is true, it should be possible to demonstrate this relation when focusing on a single interaction episode. This hypothesis was tackled in a third experiment. This time Baldwin and Sinclair (1996) did not take an individual difference perspective investigating individuals with high and low trait self-esteem, but manipulated the postulated determinant of self-esteem experimentally. To activate an accepting versus criticizing significant other schema, they asked participants to vividly imagine appropriate significant others. Immediately afterward, participants performed the same lexical decision task as in the second experiment. The results confirmed that the priming effect was again specific to the critical significant other prime and interpersonal target words.

In summary, the study by Baldwin and Sinclair (1996) provides strong evidence for the hypothesis that contingency expectations are part of relational schemata, that an activation of either a specific relational schema or of specific types of interactions can trigger related contingency expectan-

cies, which are in turn related to self-esteem. For the architecture of relational schemata this result suggests that relationship specific if–then contingencies can be generalized and activated in the form of an interaction script with the "generalized significant other."

If–Then Contingencies and Coping Behavior

Although the effects of relational schemata on self-esteem are interesting, one may object that the presumably temporal and subtle changes of self-concept and self-esteem are of academic interest only. The practical relevance of schema activation effects would be much greater if those would directly influence relationship relevant behavior. Pierce and Lydon (1998) have extended the work of Baldwin and colleagues by investigating how priming with elements of relational schemata influences behavior intentions. An unwanted pregnancy situation was chosen as a meaningful stressful situation that could be easily imagined by female students. To prime different interaction expectancies, words indicating either support (e.g., helpful, supportive, caring), rejection (e.g., critical, rejecting, hurtful), or random consonants as control stimuli were presented in alternation with masks similar to Baldwin (1994). Immediately after the priming, participants listened to a scenario describing an unwanted pregnancy, and then answered questions about support seeking and coping strategies they would adopt in this situation.

The significant effects of subliminal priming on reported affect and coping behavior were generally small but in the expected direction. Women primed with negative interaction descriptors reported less positive affect, and marginally less growth-oriented coping than women in the control condition. Women primed with positive interaction descriptors reported more seeking of emotional support, and less self-denigrating coping than women in the control condition. The chosen coping intentions appeared as if the participants would adapt to a social environment showing the primed behavior.

AFFECTIVE PRIMING AS AN IMPLICIT MEASURE OF RELATIONAL SCHEMATA

The research presented previously used priming as a method to explore the internal structural properties of relational schemata, or connections of relational schemata and other constructs. However, besides the empirical demonstration that two mentally represented entities are connected, the priming method can also be used to *measure* specific aspects of relational schemata, thus providing an interesting methodological complement to

verbal self-report or behavioral measures commonly used in relationship research. As compared to these methods, the priming approach may be more robust against self-presentation concerns and therefore provide an alternative method to assess strongly socially valued relationship qualities. However, the usefulness of this approach for the analysis of individual differences depends crucially on the psychometric properties of the priming measures. The studies presented in the following used different priming paradigms to investigate whether person-related primes do elicit person-specific priming effects, and whether these effects are sufficiently reliable for the analysis of individual differences.

A very basic aspect of the relational schema is the evaluation of or attitude toward a relationship partner. There is ample evidence that the mere activation of attitude objects or person schemata is sufficient to automatically activate an evaluation that is associated with the object (e.g., Fazio et al., 1986; Fiske, 1981). Under certain circumstances this automatic evaluation can influence subsequent behavior. Affective priming methods take advantage of this effect to measure the automatic evaluation of prime stimuli. Depending on the nature of the subsequent task two affective priming paradigms can be distinguished. In the affective priming paradigm proposed by Murphy and Zajonc (1993) affectively polarized primes (e.g., positive and negative facial expressions) are subliminally presented and immediately followed by affectively neutral target stimuli (Chinese ideographs) that have to be evaluated on a liking scale. Murphy and Zajonc showed that the valence of subliminal primes systematically influenced the subsequent liking rating, positive primes leading to more positive, and negative primes to more negative ratings of the neutral targets.

Banse (1999) adapted this paradigm for measuring the implicit evaluation of relationship partners in a large sample (N = 201). Instead of facial expressions of emotions, the names and affectively neutral faces of good friends or romantic partners were used as critical primes along with the names and faces of the participants and control primes. Deviating from Murphy and Zajonc (1993) who presented the face primes for 4 ms with a tachistoscope, Banse (1999) used PCs to present face and name primes relating to a significant other, the self, and a control for 10.5 ms. Immediately after the primes either a mask or a blank screen followed for 31.5 ms. The visibility of primes was varied using first masked and then unmasked primes. Pretests had shown that unmasked face and name primes relating to self and significant others were relatively easy to recognize. The masked or unmasked primes were then followed by Chinese ideographs that had to be rated on a 6-point liking scale.

To explore the relations between individual differences in affective priming effects and explicit measures of relationship quality, questionnaire measures of relationship satisfaction and adult attachment were ob-

tained. There is an ongoing controversy whether implicit and explicit measures of mental representations should be considered as the same or distinct constructs (e.g., Greenwald & Banaji, 1995; Fazio & Towles-Schwenn, 1999; Wilson, Lindsey, & Schooler, 2000), and in consequence it is not yet clear whether substantial correlations between these measures can be expected. In either case, correlation coefficients can be meaningfully interpreted only if the reliability of both explicit and implicit measures are sufficient. To estimate the retest reliability of the priming procedure, the priming experiment was repeated for a subsample of participants ($N = 66$) 1 to 4 weeks later.

The results showed that masked primes relating to significant others elicited significantly more positive ratings of the Chinese ideographs than primes relating to self, whereas intermediate effects were obtained for control primes. This pattern replicated across relationship types (romantic partners and good friends), and more important, the priming effects were identical for names and faces, thus providing strong evidence that effects were in fact due to an activation of person schemata and not to other features of the primes (e.g., the attractiveness of faces). The unmasked priming block showed a different pattern: For faces, the partner-related primes had much stronger positive effects than self-related primes, for unmasked names no difference was found.

Why was the affective reaction toward the self less positive than toward the partner? It is likely that the implicit partner schema is more positive due to idealization (Murray, Holmes, & Griffin, 1997), and that the self schema contains more negative attributes. The differential priming effect for the self and the other schema was statistically reliable but very small. The priming effect obtained with angry versus happy faces reported by Murphy and Zajonc (1993) was about 20 times stronger. This difference in effect size was most likely due to the much stronger affective difference between angry and happy emotional expression as compared to a significant other and the self.

The results show that the Murphy and Zajonc paradigm can be used to assess partner-specific automatic evaluation at the group level. However, the aim of using the priming effects as a measure of *individual differences* in automatic partner evaluation clearly failed. The retest reliabilities of individual priming indices were marginal at best (ranging from –.06 to .28), and no substantial correlations were found between individual priming measures and explicit measures of relationship quality or adult attachment. The lack of any substantial correlations between individual affective priming effects and explicit measures of relationship quality in Banse (1999) could indicate that this measure is *essentially* uninformative because it reflects only a gross positive–negative distinction, but bears no information about a differentiated evaluation of the relationship partner. Alternatively, the indirect assessment of implicit person evaluation via an evaluation of

neutral stimuli could lack sensitivity. As a potentially more sensitive indicator for automatic evaluation, Banse (2001) used an adaptation of the Fazio et al. (1986) affective priming paradigm with an evaluative decision task that had been successfully used as a measure of individual differences in racial prejudice (Fazio et al., 1995).

In this affective priming paradigm participants are briefly presented with affectively polarized prime words (Fazio et al., 1986) or faces of ingroup and outgroup members (Fazio et al., 1995). They then have to decide whether subsequently presented target words have a positive or negative meaning. The response latencies (or error rates) are then used as an indicator of the automatic evaluation of primes. Most studies using this paradigm have found congruency priming effects (i.e., positively evaluated primes facilitate the evaluative decision for positive as compared to negative target words, and negatively evaluated primes for negative as compared to positive target words; for an overview see Klauer & Musch, chap. 2, this volume).

The priming procedure used by Banse (2001) closely paralleled the previous experiment (Banse, 1999) except for three major changes. First, instead of a like–dislike rating task, a good–bad evaluative decision task was used. Participants had to decide whether clearly positive and negative target words had a positive or negative meaning. Second, the name and the face of a disliked person (Saddam Hussein) were added to the three person identities (self, partner, and control) used before. Third, masked and unmasked primes were not blocked but presented intermixed. Some procedural features differed from the standard procedure used by Fazio et al. (1986). A shorter prime exposure time (10.5 ms instead of 200 ms), and prime-target SOA (42 ms instead of 300 ms) was used. As in the previous study, relationship satisfaction and adult attachment self-report measures were obtained to explore the relation between individual differences in priming effects and explicit measures of relationship quality or personality.

The response time difference between negative and positive target word conditions for each prime category was used as priming index. These difference scores were not subtracted from control prime effects because the face control prime (the portrait of an unknown person) was likely to be evaluated more positively than the name control prime (the neutral word *occasion*). Referencing priming effects to the control primes might have been misleading for the analysis of group level treatment effects, as well as for the analysis of individual differences. For example, people reacting more positive to their relationship partner may also tend to react more positively to unknown persons than people with more negative partner schemata.

It was expected that primes relating to significant others (friends or romantic partners) would facilitate the evaluative decision for positive as compared to negative target words, and that primes relating to disliked persons

would facilitate the evaluative decision for negative as compared to positive target words. This hypothesis was confirmed for unmasked primes (Fig. 10.1, Panel A). As in the previous study (Banse, 1999), priming effects were very similar for face primes and name primes, providing strong evidence that the effects were caused by the evaluation of person identities and not by other characteristics of the primes such as physical attractiveness of faces. Surprisingly, for masked primes both the liked and the disliked person facilitated the evaluation of positive targets more than self-related and control primes. This unexpected finding was difficult to interpret. Because

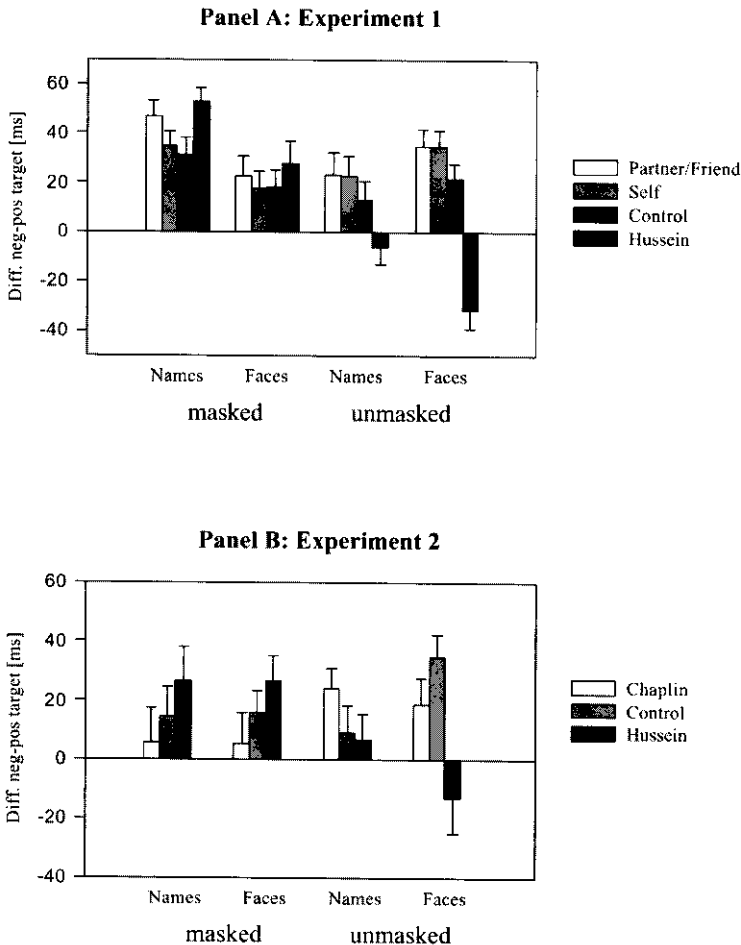## Panel A: Experiment 1

Panel B: Experiment 2

FIG. 10.1. Mean answer latency differences between negative and positive targets as a function of person identity, prime modality, and masking of primes (Banse, 2001; Reprinted by permission of Psychology Press Ltd., Hove, UK).

the positively evaluated significant others were also more familiar than the negatively evaluated Saddam Hussein, prime valence and prime familiarity were confounded.

In a second experiment a liked and a disliked person of roughly comparable familiarity (Charlie Chaplin and Saddam Hussein) were used as primes. The idiographic primes relating to the self and significant others were omitted. With this set of primes a very clear pattern of results emerged (Fig. 10.1, Panel B). Whereas the congruency priming effects of the first experiment could be replicated for unmasked primes, reverse priming effects were found for masked primes. Masked primes relating to the liked person facilitated the evaluation of negative compared to positive targets, and primes relating to the disliked person facilitated the evaluation of positive compared to negative targets. Although such reverse priming effects have been occasionally observed in affective priming studies (see Klauer & Musch, chap. 2, this volume), it is not yet clear why and under which conditions such effects occur (see also the chapters by Glaser, chap. 4, this volume; and Wentura & Rothermund, chap. 3, this volume).

The results show that it is possible to assess the automatic evaluation of persons with the Fazio et al. (1986) affective priming paradigm at the group level. To test the suitability of this approach for the study of individual differences, the reliability of the priming measure and its correlations with questionnaire measures of relationship quality were explored. The consistency coefficients (Cronbach's α) for positive split-half test correlations ranged from .0 to a maximum of .57 in the condition of unmasked priming with the name of the relationship partner. In general, unmasked priming conditions tended to show somewhat higher consistencies than masked priming conditions. Additional analysis with the priming index referenced to control primes yielded similar priming effects, but the internal consistencies were still lower.

Although the consistencies seem to be more substantial than those found in the Murphy and Zajonc paradigm (Banse, 1999), they clearly fall short of the conventionally required standard of .80. In consequence, when the priming indices were simultaneously regressed on the four attachment scales (secure, fearful, preoccupied, and dismissing attachment), few significant regression coefficients were found. Unlike the group level priming effects, regression coefficients were not consistent across name and face primes. Interestingly enough, two out of three significant regression coefficients in Experiment 1 that could be conceptually replicated in Experiment 2 were in fact replicated: Anxious attachment was related to more positive priming effects of the masked face of Hussein (Exp. 1: $b = 46.7$, $p < .01$; Exp. 2: $b = 28.1$, $p < .05$), and dismissing attachment was related to the more positive priming effects of the clearly visible faces of the relationship partner in

the first ($b = 28.0$, $p < .05$), and of the clearly visible face of Charlie Chaplin in the second experiment ($b = 29.4$, $p < .01$). As one might expect, significant regression coefficients were generally found for those priming effects with relatively high reliability. It is puzzling, however, that the sign of these regression coefficients was just opposite to expectations. The fact that anxiously attached individuals showed a more positive automatic evaluation of the masked face of Saddam Hussein may be due to the fact that priming effects for masked primes were generally reversed. However, the finding that more dismissive individuals show a more positive automatic evaluation of relationship partners (and Charlie Chaplin) is difficult to reconcile with attachment theory, because according to Bartholomew (1990; Bartholomew & Horowitz, 1991) dismissing attachment is characterized by a relatively *negative* evaluation of the relationship partner.

Although these individual differences results are interesting and certainly merit further investigation, it is obvious that the reliability of the measure of automatic evaluation should be substantially increased. This could be achieved in several ways: First, future studies should limit the number of experimental conditions and maximize the number of trials per condition. Second, in the standard procedure of the evaluative decision task presented here, there is a trade-off between reaction latencies and error frequencies. Greenwald (1995; cf. Musch, 1999) has developed an adaptive "response window technique" that forces participants to react extremely quickly. This approach has been found to concentrate priming effects on error rates, thus providing larger and more robust effects than the standard procedure (e.g., Draine & Greenwald, 1998; Musch, 1999; Otten & Wentura, 1999). Third, experimental standard techniques such as trial order randomization and counterbalancing across subjects are *not* optimal for the analysis of individual differences. In order to maximize the reliability of individual differences all experimental conditions should be kept constant across subjects. One has to chose between optimizing the experimental design for the analysis of treatment effects, or for the analysis of individual differences, both aims are partially incompatible.

An alternative experimental approach for measuring automatic evaluation of relationship partners is the Implicit Association Task (IAT, Greenwald, McGhee, & Schwartz, 1998), which uses a double discrimination task to assess the association between a pair of target concepts and an evaluation dimension or any other attribute dimension (for details see also De Houwer, chap. 9, this volume). It has been shown that IAT measures reach not only psychometrically satisfactory reliability levels (Banse, Seise, & Zerbes, 2001; Cunningham, Preacher, & Banaji, 2001), but also convergent and criterion validity when used as an implicit measure of attitude toward relationship partners (Banse, 2000; Zayas & Shoda, 2001).

PUTTING THE PIECES TOGETHER:
THE ARCHITECTURE OF RELATIONAL SCHEMATA

The empirical studies presented so far have investigated single features of relational schemata, their internal structure, or connections between the relational schema and other constructs. To conclude this chapter I would like to show that many pieces of the presented evidence can be integrated into a coherent picture of the mental representation of relationships schematically illustrated in Fig. 10.2.

As a core concept of the mental representation of relationships we have introduced the relational schema as proposed by Baldwin (1992). The relational schema is composed of the relationship specific representation of the partner (Pa) , the self (S), and the interaction (Int) between the self and the partner. Each of these three elements is in itself conceived of as a
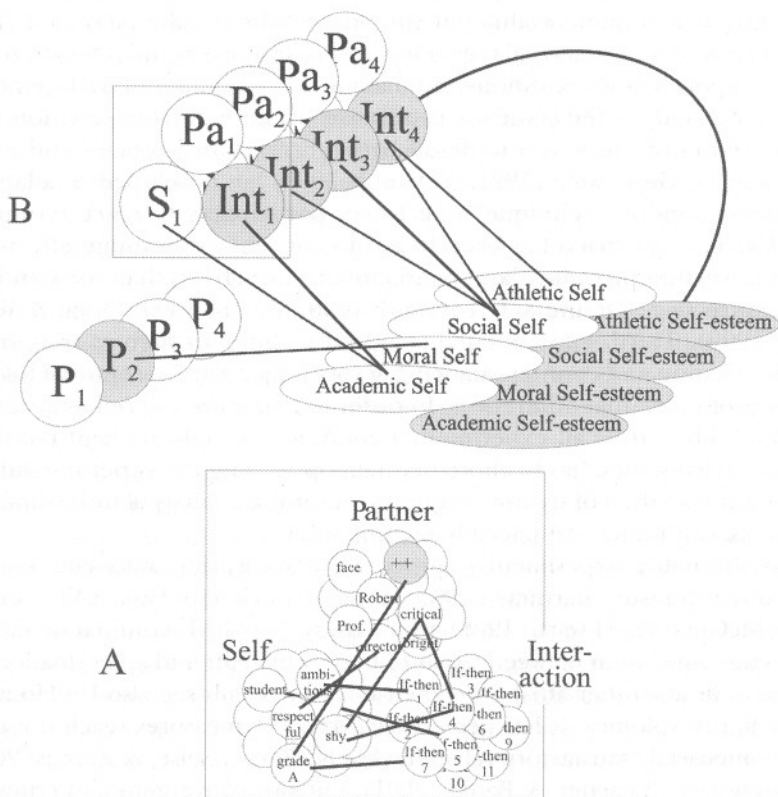

FIG. 10.2. An associative network containing a relational schema (Panel A), and its interconnections with other relational schemata, person schemata, and the cognitive representation of the self (Panel B).

complex knowledge structure containing declarative knowledge relating to the self and to the partner, as well as procedural knowledge or if-then contingencies in the interaction part (Fig. 10.2, Panel A).

We have seen that the representation of significant others (e.g., romantic partners and friends) and known persons who are not relationship partners (e.g., Saddam Hussein or Charlie Chaplin) contain an evaluative component (++) that can be automatically activated on the mere presentation of the name or the face of this person (Banse, 1999, 2001). In Fig. 10.2, person schemata (P) and the person part of relational schemata (Pa) are conceptualized as basically similar knowledge structures. However, the results of Glassman and Andersen (1999) suggest substantial differences in the internal organization of person versus partner schemata. A priming with the self-generated descriptions of significant others caused transference, whereas primes relating to nonsignificant others did not. This result indicates better accessibility and/or higher interconnectedness of stored person information within relational schemata as compared to mental representations of nonsignificant others (see also Andersen, Glassman, & Gold, 1998).

Due to their asymmetric nature, the cognitive representation of some role relationships have an intermediate status between relational schemata and the representation of unacquainted persons. The representation of distant authorities (e.g., the Pope) may lack the interaction part of a relational schema but nevertheless be connected to the representation of the self. As nicely shown by Baldwin et al. (1990), even a subliminal exposure to a critical moral or academic authority may suffice to temporarily lower self esteem, provided that the moral or academic context is made salient. Panel B in Fig. 10.2 depicts some of the connections between different relational schema, other person schemata, and the self. The different types of relationships are illustrated by the link between a person schema (P_2) symbolizing the Pope and the moral self, and a link between the first relational schema (symbolizing an academic authority) and the academic self/self-esteem. Although the results of Baldwin et al. (1990) did not conclusively show that relational schema were differentially related to those aspects of the self that are directly pertinent for the relationship, other studies have shown that domain-specific selves and self-esteem can be empirically distinguished (e.g., Marsh, 1993; Marsh & Yeung, 1998). It seems therefore reasonable to assume that these different aspects of the self and of self-esteem are more or less related to different significant others. The relational schema of an academic supervisor should be more closely related to the academic self than the schema of the pope, even for practicing Catholics.

There is substantial evidence supporting the representation of interaction as part of specific relational schemata. Baldwin and Sinclair (1996, Exp. 3) demonstrated that if–then contingencies or interpersonal expectancies are relationship-specific. After priming with an evaluative person, a

contingency between success and acceptance as well as between failure and rejection became apparent in a lexical decision task. When primed with an unconditionally accepting significant other, no contingency was found.

Baldwin and Sinclair (1996, Exp. 1) have also demonstrated that the representation of if–then contingencies are meaningfully related to individual differences in self-esteem. Only individuals with low self-esteem showed a contingency between success and failure and acceptance and reaction. If–then contingency representations were not only demonstrated for specific relationships but also at a more abstract level. Baldwin et al. (1993) showed that individual differences of secure versus avoidant attachment were meaningfully related to the expectation of positive versus negative partner behavior. Pierce and Lydon (1998) showed that subliminal priming with words describing supportive versus rejecting interaction was related to different intended coping strategies and anticipated affect in a stressful situation. These results strongly suggest an activation of the interaction part of relational schemata *across relationships*, and a connection with *general* self esteem. The organization of such generalized features are illustrated in Fig. 10.2 by the two gray shaded connected rows of interaction units and specific self-esteem units. This simultaneous representation of specific relationships and the "generalized other" is conceptually akin to a hierarchical models of internal working models in attachment theory (e.g., Collins & Read, 1994).

Up to now there seems to be little empirical support for the third postulated element of relational schemata (i.e. a set of different relationship specific representations of the self). It is theoretically plausible that the self-representation of individuals may differ between relationships. For example, a female executive may represent herself as dominant, assertive, and competitive in a close work-relationship, and as nondominant, insecure, and caring in a romantic relationship. However, due to the highly idiosyncratic nature of intra-individual differences of self representations an experimental demonstration using the priming method remains a challenge for future research.

Limitations of the Associative Network Approach

Most of the empirical findings presented previously can be translated into simple structural features of an associative network representation as shown in Fig. 10.2. However, some of the presented results seem to require a more complex model. For example, the results of SPA research as summarized by Hardaway (1990) suggest that the relational schema representing the mother relationship may have a privileged status. SPA researchers presume that the power of the "Mother and I are one" prime lies in the unconscious motive to merge with "the good mother of early childhood" (Silverman &

Weinberger, 1985), and that the specific priming effects of this schema on therapy success and other global outcome measures is mediated by positive mood (Weinberger, 1992). Moreover, these priming effects seem to be stronger under subliminal than under supraliminal priming conditions (Bornstein, 1990). Although it may be possible to handle such conditional activation effects as well as general effects of mood and motivation in an associative network model, alternative approaches such as connectionist or parallel distributed processing models could prove to be more adequate (see for example Smith, 1996).

APPARENT INCONSISTENCIES, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

Multiple Word Primes

Scholars of unconscious cognition (e.g., Draine, 1997; Greenwald, 1992) have raised serious doubts that the multiple word primes used in SPA research (e.g., "Mommy and I are one") have any effects at sentence level that go beyond the additive effects of individual words. Draine (1997) noted that the existence of sentence level effects has in fact never been explicitly tested in SPA research. He concludes from his own research that it is very improbable that sentence level information can be processed outside of awareness. However, perhaps these apparently contradictive positions can be reconciled. First, neither SPA results nor the multiple word priming effects reported by Glassman and Andersen (1999) provide unambiguous evidence that primes have been processed at sentence level, the effects may in fact be due to single word effects. The "Mommy and I are one" prime may be more effective than primes of the type "Daddy and I are one" because of stronger effects of the word *Mommy* as compared to *Daddy*; and primes related to oneness (e.g., "My Girl and I are one"; "Father and I are one)" may have substantial but weaker effects due to the prime words referring to other relationship partners, and not to oneness. Also the finding that the prime sentence "Mommy and I are one" was found to be more effective than "Mommy is gone" (Weinberger, 1992) can be explained in terms of single word effects. For example, the word *gone* may reduce the priming effect of *Mommy* relative to the word primes *I, Are,* and *One*). Draine (1997) has found additive single word effects with affectively polarized words for both supraliminal and subliminal priming procedures. As long as multiple word primes are able to activate relational schemata, the implications·of SPA results and those of Glassman and Andersen (1999) for relationship research would remain the same even if the effects were eventually found to be due to single word effects.

Second, it is important to note that almost all studies reporting subliminal priming effects of relational schemata (Baldwin, 1994; Baldwin et al., 1990, 1993; Baldwin & Sinclair, 1996; Glassman & Andersen, 1999; Hardaway, 1990; Pierce & Lydon, 1998) differed from the standard priming method as used in unconscious cognition research (e.g., Draine, 1997). In the research tradition of the latter, subliminal priming effects are typically assessed immediately after *each single* trial, and primes with opposite effects are presented intermixed. The typical priming approach in relationship research, however, uses a repeated presentation of *a single* prime, or a set of *functionally equivalent* primes, ranging from several presentations to very massive repetitions of up to 300 (Baldwin, 1994) before assessing priming effects. In other words, whereas primes in relationship research tend to be *consistent* with respect to the activated mental content, the default procedure in experimental cognitive and social psychology uses *inconsistent* sets of stimuli including primes and targets. It may be that the repetition of subliminal primes is critical to process even multiword strings in a piecemeal fashion, either at sentence or at single word level. Moreover, there is evidence that priming effects increase as a function of the frequency of consistent subliminal primes (Bargh & Pietromonaco, 1982; Devine, 1989). In other words, priming effects seem to accumulate across trials. The procedural difference between consistent and inconsistent priming may explain the apparent contradiction between subliminal priming effects in relationship research, which often last up to several minutes, and the very fast decay of subliminal priming effects in experimental psychology, which seem hardly ever to survive 1000 ms. In the light of the evidence presented here it seems promising to consider the effects of prime consistency and prime repetition in future attempts to tackle Greenwald's (1992) still fascinating "two-word-challenge".

Limitations of the Priming Approach

The studies presented here provide convincing evidence that the priming method is a valid approach for the investigation of the mental representation of relationships. However, like any other method in psychology, the priming approach has problems and limitations. A general problem concerns the notoriously weak effect sizes. In many of the studies presented here, expected effects were only marginally significant, or significant effects were not found for all conditions or for all dependent variables for which effects were expected. This may indicate that experiments often operate at the minimal level of required statistical power.

Unlike verbal self-report measures, priming effects seem to be quite robust against voluntary distortions caused, for example, by positive self-presentation. Subliminal priming procedures exclude that results are influ-

enced by voluntary behavior, but also supraliminal priming yields valid and generally similar results if participants are unaware of the relation between the priming and the subsequent assessment of priming effects. If this relation becomes obvious (e.g., Banse, 1999; Baldwin, 1994; Bornstein, 1990) a dissociation between subliminal and supraliminal priming may result. There is also evidence that supraliminal and subliminal priming may lead to different priming effects even if the supraliminal method is considered to preclude any deliberate voluntarily control about the dependent measure (Banse, 2001). In consequence, the internal validity of priming measures should not be taken for granted. Especially in subliminal priming, effects may depend on nonobvious boundary conditions. Even subtle and apparently peripheral procedural modifications may have dramatic effects. Moreover, prime stimuli may not activate the intended mental content but instead other mental structures thus leading to unpredicted or even opposite priming effects (see Fiedler, chap. 5, this volume). For these reasons it is advisable to use strong research designs to establish the internal validity of priming effects by demonstrating the specificity of effects, their internal replication, or convergence with other measures.

Suggestions for Future Research

As pointed out earlier, there are two main reasons to use priming methods in relationship research. One is to avoid that the assessment of relational schemata is distorted by self-presentation concerns. Some of the studies presented before took advantage of the low controllability of priming effects to exclude alternative explanations of results obtained using explicit verbal self-report measures. A second potential advantage of priming methods consists in their potential capacity to assess aspects of mental representation that are *not* consciously accessible. Here still lies a major challenge for the "relational cognition" approach. In a first step it seems necessary to develop implicit measures that are sufficiently reliable for assessing relational schemata at the individual level. It remains to be seen whether such measures will be based on improved priming paradigms (e.g., Draine & Greenwald, 1998), other approaches such as the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998), or entirely new techniques.

Although proponents of the subliminal psychodynamic activation paradigm claim that their experimental results are due to an activation of unconscious content, to my knowledge it has not yet been conclusively demonstrated that priming or other response time based measures are able to assess unconscious contents of relational schemata. A first obstacle in this endeavor is to define an empirical criterion that allows to distinguish between truly unconscious content and content that is consciously accessible but not reported. Here attachment theory could offer a pragmatic test: An

implicit measure could be considered to tap unconscious aspects of a relational schema if it were able to identify individuals classified as insecure in the Adult Attachment Interview or analogue indirect interview techniques, but as secure in explicit self-report measures. Obviously such an implicit measure would be extremely interesting for relationship research because it would provide a second avenue to investigate empirically the discrepancies between conscious and unconscious mental representations of relationships.

ACKNOWLEDGMENTS

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