

Marital Research in the 20th Century and a Research Agenda for the 21st Century

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In this article we review the advances made in the 20th century in studying marriages. Progress moved from a self-report, personality-based approach to the study of interaction in the 1950s, following the advent of general systems theory. This shift led, beginning in the 1970s, to the rapid development of marital research using a multimethod approach. The development of more sophisticated observational measures in the 1970s followed theorizing about family process that was begun in the decade of the 1950s. New techniques for observation, particularly the study of affect and the merging of synchronized data streams using observational and self-report perceptual data, and the use of sequential and time-series analyses produced new understandings of process and power. Research in the decades of the 1980s and 1990s witnessed the realization of many secular changes in the American family, including the changing role of women, social science's discovery of violence and incest in the family, the beginning of the study of cultural variation in marriages, the expansion of the measure-

ment of marital outcomes to include longevity, health, and physiology (including the immune system), and the study of comorbidities that accompany marital distress. A research agenda for the 21st century is then described.

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THE first published research study on marriage was a book by Terman, Butterweiser, Ferguson, Johnson, and Wilson's (1938). They had one major research question, namely, "What is fundamentally different about happily and unhappily married couples?" That question was to become a persistent one in the field of marital research throughout the 20th century. Terman et al. were operating within the long shadow cast by individual personality theory, and they therefore phrased the question as, "Are some personality traits more ideally suited to successful marriage?" In those early days of marital research, investigators firmly believed that self-report methods for measuring personality traits were adequate, and they had no worries about common method variance problems. Common method variance means that using the same method of measurement to measure two different ideas or constructs is problematic; it is related to many phenomena such as the phenomenon that measuring

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two different constructs with the same method tends to yield higher correlations than measuring the same construct with two different methods. We have now learned that common method variance is a fatal flaw in a great deal of marital research. Unfortunately, this methodological problem (trying to "explain" one questionnaire solely with another questionnaire) also has pervaded most of 20th century research on marriage, at least until multiple measurement operations began to be employed in the same study.

Terman et al. found no evidence to support an optimal personality profile for happy marriage; people unhappy in their marriages tended to complain about a wide variety of things, a phenomenon that later was called both negative affectivity and neuroticism. In general, the first 30 years of research on marriage was based almost entirely on pencil-and-paper self-report measures of marital functioning and in dealing with variants of Terman's original question, eventually including stability as well as satisfaction (see Hicks & Platt, 1970). Little headway was made in the study of personality correlates of marital satisfaction until researchers thought of asking *each spouse* to describe the personality of the *partner*. Then, almost all partner-reported personality variables were related to marital satisfaction. However, it was unclear that personality was actually what was being measured.

By the mid-1950s it became evident to most researchers who studied marriage (by now almost entirely sociologists) that pencil-and-paper measures of marital functioning were significantly (usually moderately to highly) correlated if there were a wide enough range of marriages (from miserable to very happy) in a study (see Burgess, Locke, & Thomes, 1971). They began developing standardized short-form measures of marital satisfaction, obtaining norms, and studying de-

velopmental patterns over the life course. As with all factor analytic techniques applied to complex constructs (e.g., work on intelligence) this unidimensional nature of marital satisfaction does not imply that it isn't also multidimensional, since both solutions receive support; furthermore, it may be useful clinically to have an overall measure of marital quality as well as a self-report profile of various aspects of the marriage for diagnosis and clinical intervention.

The moderate to high relationship between most measures of marital functioning as well as moderate correlations of marital satisfaction with spouses' descriptions of their partners' personality traits led to the discovery of the first two replicated phenomena in the area of marital research. These phenomena were the positive and negative halo effects. Here are the two halo phenomena: in unhappy marriages, people tend to endorse almost any negative item about their partner; in happy marriages, people tend to endorse almost any positive item about their partner. Later, in the 1980s this same phenomenon was recast in attribution theory terms as follows: in unhappy marriages, people tend to attribute the negative things their partners do to lasting, unflattering personality traits (the most common being selfishness), and attribute positive things their partners do to fleeting, ephemeral, situational factors. In happy marriages people attribute the positive things their partners do to lasting flattering personality traits and attribute negative things their partners do to fleeting, ephemeral, situational factors. Hence, the early research on personality found that it wasn't so much each person's personality, but the partner's *perception* of the other's personality that was related to marital satisfaction. Note that these findings were, by themselves, of questionable use for clinical intervention.

With the study of norms and developmental patterns of marital satisfaction, some grim findings began emerging from research on marriage. Burgess' longitudinal study (Burgess & Wallin, 1953) found that, for most couples, marital satisfaction was high right after the wedding and then began a slow, steady, and nontrivial decline thereafter. The steady march toward disappointment, misery, and disillusionment appeared to be characteristic of almost all marriages. Although cross-sectional studies differed in their findings, most reported that marital satisfaction did, reliably, deteriorate steadily after marriage, reaching its minimum in mid-life, and began increasing again only when children left home. While there was initially much debate on this point, most studies—especially 13 of the 15 longitudinal studies—found that the arrival of children seemed to spell not conjugal bliss but stress and a precipitous and dangerous decrease in marital satisfaction (e.g., Belsky & Kelly, 1994). Hicks and Platt's (1970) decade-review article on marital happiness and stability concluded that "perhaps the single most surprising finding to emerge from research is that children tend to detract from, rather than contribute to marital happiness" (p. 569).

Then, in the mid-1950s, there was a sea change in marital research. While its historical roots can be traced back to the 1930s (especially to Ackerman, 1958), it was in the 1950s that the first dramatic conceptual break was made with the Terman personality-based tradition for studying marriage. The break was the advent of an *interactional perspective* on marriage rather than a personality perspective. This change was inaugurated by the classic double-bind article by Bateson, Jackson, Haley, and Weakland (1956). For marital research, it had powerful consequences. It suggested that characteristic and rigidly entrenched dysfunctional interaction patterns could be observed by

watching clinical families, and dismantling the basic verbal and nonverbal components of messages sent and received. Furthermore, the authors suggested that these repetitive patterns of interactive behavior had profound implications for dysfunctional schemas of thought or even thought disorder. Thus, the interactional perspective focused simultaneously on cognition and interactive behavior. However, the interactional perspective required observational methods and demanded a focus on process. Indeed, in the 1960s the progenitors of the interactional view founded a new journal called *Family Process*. The new journal was to speak to both researchers and practitioners. Broderick's (1970) theoretical review piece—which initiated the decade-review articles in the *Journal of Marriage and the Family*—was entitled "Beyond the five conceptual frameworks," and attempted to introduce general systems concepts to sociological researchers.

Surprisingly, simultaneously in social psychology a similar sea change occurred, and it was also a breakthrough that emphasized interaction patterns. Thibaut and Kelly's (1959) book, "*The social psychology of groups*," proposed a description of social interaction in terms of "payoff matrices" of costs and benefits for particular two-person interactions. They proposed that the repertoire of behavioral exchanges between two people could be listed and associated with particular costs and benefits, and that, in effect, the *payoff matrix* defined the relationship; this approach could be made mathematical by the notation that if person-1 displayed behavior b_1 to person-2 it was done with a particular payoff represented by a number. Using the idea of the payoff matrix, various relationship configurations could be described, such as win-lose and win-win configurations. One way of construing the payoff matrix is in terms of actual rewards or costs (and this was the way

social psychologists preferred), while another way of construing behavior exchange is in terms of the *perceived* rewards and costs of particular exchanges; the latter is one way of operationalizing cognitive schema of interaction. This was not the mainstream approach taken by social psychologists, but it was the approach of some marital researchers.

We briefly depart from this historical review by noting that confluence in measuring both cognitions and interactive behavior was to come later in several forms. In the early 1970s, the Gottman laboratory built what they called a "talk table" whereby couples were videotaped in a conversation while they rated the perceived costs and benefits of each exchange. The behavior of the couple was then separately coded from the videotapes. In this way the positivity and negativity of exchanges could be separately assessed in the domains of behavior as well as cognition (Gottman, Markman, & Notarius, 1977). Later, in a brilliant study, Notarius, Benson, Sloane, et al. (1989) used a video recall method to create a time-synchronized stream of both behavior and Thibaut-Kelly-style of payoff matrix cognitions. This methodological breakthrough was important; the Gottman and Levenson laboratories, also using a video recall rating dial, were able to add physiological measures within the same time-synchronized stream to test hypotheses that previously had defied operationalization (Gottman & Levenson, 1985).

This time-synchronized blending of multiple measurements with observational measures in one investigation makes it possible to ask more sophisticated questions at the interfaces of the domains of behavior and perception. Notarius et al. (1989) pioneered a methodology for mapping the interface between perception and behavior in their experimental investigation of Weiss's (1980)

concepts of positive or negative sentiment override, and Gottman, Notarius, Gonso, and Markman's (1976) concept of editing. The concept of sentiment override implies a discrepancy between a spouse's subjective evaluation of partner's behavior and an outsider observer's evaluation of the same precise behavior. The valence of any discrepancy between spouse and unbiased observer in evaluating the partner's behavior would define positive or negative sentiment override. "Editing," however, implies a precise sequence of interaction in which a spouse responds positively (or even neutrally) immediately after accurately perceiving his or her partner's behavior to be negative (i.e., the perception matches an unbiased observer's assessment of the immediate antecedent). The important point is that these salient interactional processes can be studied only through an examination of the interface between behavior and perception. Applying log-linear modeling to the observational and subjective data, Notarius et al. (1989) found a surprising similarity among nondistressed wives and distressed and nondistressed husbands. The perception of distressed wives was heavily under the influence of negative sentiment override and these wives were least likely to edit out a negative reply to their husband's negative interactions. In contrast, nondistressed wives and distressed and nondistressed husbands were subjectively more likely to evaluate their partner's negative messages as neutral or positive; even when they made a negative evaluation, they were less likely to respond negatively.

In the late 1960s and in the 1970s, a large set of suggestions emerged (without empirical support) about what was "dysfunctional" in both interactive behavior and social cognition in relationships. In the marital area, the dysfunctional cognitive schema identified by Paul Watzlawick was mindreading (Watzlawick, Beavin, &

Jackson, 1967), which is attributing things to a partner without adequate evidence or expecting a listener to know what the speaker needed without any explicit information provided by the speaker. Lederer and Jackson (1968), in their highly influential book "*The mirages of marriage*," proposed several seminal hypotheses including: (1) the *quid pro quo*, or that a failure of a (usually covert) positive reciprocity contract characterized unhappy and unstable marriages; (2) unrealistic romantic illusions and unrealistic high standards about love characterized unhappy and unstable marriages.

Hence, by the mid-1970s there were two new approaches that suggested examining a relationship using interactive behavior and social cognitions about the interaction itself. In 1974, in a breakthrough research study, Raush, Barry, Hertl, and Swain were motivated to apply the thinking in these two approaches to the longitudinal study of couples going through the transition to parenthood. Using improvised conflict situations, they observed marital interaction and they then used an early form of sequential analysis (multivariate information theory) of these patterns of interaction to suggest cognitive schema associated with these patterns. The meta-theory they proposed was called "adaptive probabilism," which they intended to be a shift from a deterministic view of interactive behavior to a probabilistic one. Unfortunately, they did not use a separate method to measure cognitions or to operationalize Thibaut and Kelly's payoff matrices. Instead, they turned to a study of interactive games.

Games or naturalistic interaction? Initially, in the early years of observing couples, structured interactions with specified payoff matrices (also called games) were used in some studies (e.g., Ravich, Deutch, and Brown, 1966 used a trucking game; Straus and Tallman, 1971, used a game called SIMFAM, a shuffle-board

kind of game with uncertain rules; and Gergen, 1969, noted that the Prisoner's Dilemma game was used extensively). However, it turned out that behavior was so constrained in these games that they tended not to detect the actual level of distress. Thus, one can conclude that these situations had limited validity. The lack of correlation implies that there are many couples who are quite competent in communication and cooperation in constrained situations, but not during their own marital conflicts (and possibly conversely). This means it is possible to find contexts of communicative competence in even the most distressed marriages. Perhaps the therapist could build upon these inherent talents and generalize skills to marital situations.

One of the major conclusions of the Raush et al. (1974) study was that when interaction was *observed*, Talcott Parson and colleagues' (Parsons, Bales, Olds, et al., 1955) distinction of women as expressive and men as instrumental was not tenable. Women were highly instrumental in conflict interactions as well as expressive, and the same was true of men; gender differences were not quite so clear-cut. In fact, Raush et al. concluded that, during pregnancy, women tended to be coercive and men conciliatory, but that these patterns changed after the baby's arrival (see also Broderick, 1970). Indeed, we are confident that anyone who actually observes women and men in families would conclude that both men and women are emotionally expressive and instrumental. In fact, the Tannen (1990) and Aries (1976) work on gender differences in language in the workplace has never held in families: women's language is not tentative during marital conflict, nor is it designed to facilitate conciliation and pair bonding; instead, it is strong, assertive, persuasive, thoughtful, and definite. It is well known that women start 80% of all marital conflict discussions; generally,

women are not reticent in their presentation of the issues nor are they without analyses of the problem and suggestions for its solution (Ball, Cowan, & Cowan, 1995). None of these conclusions could have been drawn by collecting only self-report data.

Returning to the emergence of the interactional perspective: in the late 1960s, von Bertalanffy (1968) proposed a global approach called *General System Theory*. It stimulated a flurry of theoretical clinical writing suggesting that social interaction was very rich but could be dismantled and understood by examining its components. This led to a perspective on research as well as clinical work that was breathtaking in its scope. The idea was that psychopathology was caused by dysfunctional family interaction (and resultant dysfunctional thought patterns), and that the therapist should be viewed as a cybernetic engineer who would change these patterns by clarifying messages, build in self-sustaining feedback mechanisms, thus ending dysfunctional social cognitions (such as mindreading), and replacing dysfunctional patterns (double-bind messages) with functional ones (e.g., metacommunication).

But what exactly were the dysfunctional patterns? Theoreticians answered that they were patterns that prevented healthy development, which to some writers (Bateson, Jackson, Haley, & Weakland, 1962), meant double-binding messages; to some (Wynne, Ryckoff, Day, & Hirsch, 1958) meant pseudo-mutuality; to some (Bowen, 1961) meant blocks to differentiation (by which he meant being able to control emotion with reason); to others (Lidz, Cornelison, Fleck, & Terry, 1957) meant schism, skew, and symbiosis. These concepts were never clearly defined, and in his decade-review article on marital therapy Olson (1970) noted that most of these concepts had been derived from work with families of schizophren-

ics, and that they have no empirical validity. In the marital area, it is not necessary that one be right, just that one be interesting. That is to say, a great service was provided by suggesting hypotheses about what is functional and dysfunctional, especially if these ideas were measurable and potentially disconfirmable (which many were not).

The ideas about dysfunction and function were very good ideas, and they led to a new kind of research in the marital area. One of the things that these ideas accomplished is that they led to the use of observational methods in addition to the older self-report methods. They also led to the study of the *context* of the interaction (e.g., is the interaction conflictual or not), an idea that was never suggested by the study of personality, which presumably measures traits independent of situational context.

In the 1970s, a few behavioral and child psychologists entered the field of marriage research armed with observational systems that made it possible to measure marital interaction patterns with complex codes that could *describe* interaction. This is a subtle point, but observational measures (unlike personality scales) have the potential for providing just a description of interaction that is atheoretical and basically "dust-bowl" empirical. The process of quantitative description was skipped when studying marriages with other methods. However, observational methods could describe interaction. These methods therefore held a new potential for surprise and discovery. This spirit of discovery was also vitalized by the 1974 publication of an important volume edited by Lewis & Rosenblum entitled *"The effect of the infant on its caregiver."* The book called for new descriptive and analytic research on actual face-to-face interaction between babies and caregivers. It stimulated new methods of observational data collection and data analysis that led to

the development and use of sequential analytic and time-series methods to describe the patterning of interaction between people over time.

This work, applying observational methods to the study of marriages, was begun with great energy and optimism. Unfortunately, the empirical research on troubled families was never able to support the interactive perspective's beautiful and complex hypotheses of dysfunction that had been proposed based largely on clinical observation. In general, research showed that troubled families were not characterized by more frequent use of double-binding messages, by more nonverbal-verbal channel inconsistency, by fewer metacommunicative messages, and so on. Instead, by and large, the data tended to support the conclusion that troubled families (or unhappy couples) were simply more negative (and to a smaller degree, less positive), and more likely to reciprocate negativity than was the case in well-functioning families (or happy couples). Hence, the observational data on the interactional perspective directed researchers to the importance of *affect* in understanding functional and dysfunctional marriages (e.g., Gottman, 1979).

This research work on emotion in the 1970s and 1980s was facilitated by two major methodological breakthroughs in the study of affect: the work of Ekman and Friesen (1978) and Izard (1972) on facial expressions of emotion, as well as the work of Scherer and Ekman (1982) on vocal expressions of emotion. Before Ekman and Friesen's work, a review by Bruner and Taguiri (1954) had suggested that the face was "a researcher's nightmare," and that no sense could be made of the thousands of potential facial actions. However, Ekman, Friesen, and Ellsworth's brilliant book (1972) decimated Taguiri and Bruner's position, and subsequent anatomical and physiological work by Ek-

man and Friesen's lab and Levenson's lab showed that there are indeed a set of cross-culturally universal facial expressions of emotion with distinct physiological profiles for at least seven primary affects (happiness, surprise, disgust, contempt, sadness, anger, and fear). Furthermore, although there is still some debate on this point, it now appears that these primary affects have particular autonomic profiles or "signatures"—much as had been suggested by Darwin's (1998/1882) classic work on emotion—that probably have adaptive value (Levenson, Ekman, & Friesen, 1990). For example, Darwin suggested that the facial expression of disgust closes the nostrils and protects against potentially harmful fumes.

The empirical *data* from the interactional perspective thus required a major shift from the original general systems ideas of the complex dismantling of the components of messages and feedback mechanisms and their accompanying cognitions to the importance of affect. It also required a major shift away from the model of the therapist as a cybernetic engineer of communication processes. Instead, it suggested that the marital therapist needs to be an expert in emotion. Unfortunately, few marital researchers (or therapists) were very interested in the study of emotion, nor were they knowledgeable about emotion research. The major exception in the marital therapy area was the seminal work of Greenberg and Johnson (1988) in their development of an emotionally focused marital therapy. Still, to date, few marital researchers have learned about emotion research in a scholarly manner; for example, they have not learned how to use the powerful, anatomically based Ekman and Friesen Facial Action Coding System (Ekman & Friesen, 1978), nor have many employed it in their own work with couples.

New work on the physiology of affect and relationships expanded the focus on

marital satisfaction and stability to the functioning of the autonomic nervous system, to the functioning of the endocrine and immune systems (e.g., Kiecolt-Glaser, Fisher, Orgrocki, et al., 1987), and it expanded the focus of study from marital satisfaction and stability to other measures, such as health and longevity. To summarize briefly: a great deal of research, work on health, illness, and longevity, suggested that the most important predictors were the quality of people's closest relationships, particularly marriages and friendships; furthermore, it was the affective qualities of these relationships that did the work in prediction and understanding of correlations (Berkman & Breslow, 1983; Berkman & Syme, 1979; Friedman, Tucker, Schwartz, & Tomilson, 1995).

Despite these new findings on affect, relationships and health, unfortunately for the study of marriages, the mainstream focus in the social and behavioral sciences was to become *cognition* and not affect. We are living through the cognitive neuroscience revolution. Hence, while the research findings on relationships were leading researchers logically to a greater detailed study of affect, the field was becoming increasingly cognitive. However, the importance of affect could not be avoided. Even in the purely cognitive study of attributional processes, the research findings pointed to a systematic global distortion of cognitive processing that accompanied marital misery. This was a rediscovery of the twin halo effects that accompanied happy or unhappy marriages.

Power is a concept that sociologists early proposed as relevant in the understanding of marriages. It was logical to attempt an extension of the ideas of status and class from the societal level to the family or marital level. However, power turned out to be a complex and difficult notion in the study of marriages. The var-

ious ways of operationalizing power (such as who wins contested decisions) all made sense, but, unlike marital satisfaction, they tended to be uncorrelated with one another. In Broderick's (1993) brilliant monograph entitled "*Understanding family process*," he wrote: "Literally hundreds of studies have been done on family power, who wields it and at whose expense. The matter has turned out to be complicated and elusive. As a result, the scholarly literature on family power is voluminous, complex, and often contradictory" (p. 164). This is true, despite the fact that most measures of power have been based on self-report. But the lack of convergence of different operations designed to measure power is a problem even when observational measures are used. Broderick's critique of the power concepts was that they all required conflict (the amount of which varies dramatically across families and across the life cycle), and that basic observational research (e.g., by Vuchinich, 1985) shows that most dinner-time family conflicts end in a standoff in which neither party yields but the topic is dropped. The remaining minority of such conflicts end most frequently by withdrawal; by far the least common response was submission. Hence, how is one to assess a family power structure in naturally occurring conflicts?

Other definitions of family or marital power that are not based so heavily on conflict resolution have emerged (e.g., the distribution of family resources, the allocation of household tasks, who speaks most, who interrupts most, the allocation of prestige, family coalitions, and alliances), and it remains to be seen whether these measures will add any light to the understanding of marriages. A promising mathematical approach was suggested initially by Rapoport (1960, 1972), using differential equations to represent parameters of mutual influence (for an explanation of the Rapoport model, see Bro-

derick, 1993, pp 71-75). Rapoport had no data for his model, no idea of what to measure, and his equations were linear, which are well-known to be unstable. However, in recent years, *nonlinear* equations have been successfully applied (empirically) following the Rapoport example (Cook, Tyson, White, et al., 1995; Gottman, Murray, Swanson, et al., in press; Gottman, Swanson, & Murray, 1999). Nonlinear equations may be stable or unstable, and the models can specify a set of parameters of power that vary as a function of affect, that is, they specify mathematical power functions. The basic idea in this new approach is to define power in terms of affect, as the ability of one person's affect to change another person's affect. This development is a fulfillment of von Bertalanffy's (1968) general systems ideas, which proposed mathematical functions linking parts of an interacting system.

In the decade of the 1980s, there was a veritable explosion of theoretically based research on marriage. Spanier and Lewis's (1980) decade-review article on marital quality noted that there were more husbands in samples, more attention to couples and joint assessment of both spouses, the rapid expansion in the use of observational techniques, and greater attention to methodological and measurement issues. There was also an increasing awareness of the importance of male and female roles. Gelles' (1980) review noted that research on family violence emerged in the decade of the 1970s: research in the 1960s tended to view domestic abuse as "rare and confined to mentally disturbed and/or poor people, research in the 1970s revealed family violence as an extensive phenomenon which could not be explained solely as a consequence of psychological factors or income" (p. 873; see also Straus, 1979). Racial and cultural variations in American families became objects of study, with the first re-

ports of positive aspects of minority families emerging (Staples and Mirandé, 1980), as well as cross-societal family research (Osmond, 1980). Nontraditional and single-parent families began to be recognized and studied in the decade of the 1970s (Macklin, 1980), and attention began to be paid to older families (Streib & Beck, 1980). The phenomena of desertion, divorce, and remarriage also received attention (Price-Bonham & Balswick, 1980). In the 1980s marital quality continued as a topic of study with an increase in longitudinal investigations and the use of larger and more representative samples (Glenn, 1990); many studies began noting the decline in marital quality after the assumption of the parental role; there was more detailed study of marital communication (Noller & Fitzpatrick, 1990), the rise of feminist perspectives (Ferree, 1990), and the study of marital dissolution and the consequences of divorce (Kitson & Morgan, 1990; White, 1990), particularly for children. There was increasing attention to remarriage and stepfamilies (Coleman & Ganong, 1990), families with adolescents (Gecas & Seff, 1990), and families in later life (Berardo, 1990; Brubaker, 1990). The study of domestic violence had grown to include the sexual abuse of children (Gelles & Conte, 1990). There was a growing awareness of the impact of the family on health and longevity (Ross, Mirowsky, & Goldsteen, 1990), and of the impact of economic distress (Menaghan & Parcel, 1990; Voydanoff, 1990).

Observational measurement and its contribution to marital process: In the 1970 decade-review articles published by the *Journal of Marriage and the Family*, other than Broderick's theory monograph (1970), there is no separate recognition that observational measures can contribute anything unique to the study of process. Yet in the decade of the 1970s this was precisely the contribution of the few

clinical and developmental psychologists who began studying and modifying marriages primarily from a behavioral perspective. In 1974 a major book was published edited by Lewis and Rosenblum, entitled "*The effects of the infant on its caregivers.*" The book was a call for the study of bi-directional effects in parent-infant interaction, and also a call for the development of new methodological techniques for the study of temporal patterning in social interaction.

The need for a tenacious focus on process: Observational research plays a major role in research on marriage, both for purposes of description and for building theories of the mechanisms underlying central phenomena occurring within families. It is the main highway available for the precise study of family process. It has always been obvious to many scientists that observational research can enhance the study of marriages by adding a depth and richness to other, less expensive methods, such as surveys and questionnaires. Recently, however, it has also become clear that observational methods can also add predictive power and theoretical clarity. These important accomplishments stem, in part, from the power of observational data to reveal a replicable portrait of complex social interaction that lies beyond the usual awareness of even the most keenly sensitive spouse or partner, and thus lies beyond assessment with self-report instruments.

Many of these advances have also been enabled by significant technological breakthroughs in observational research that occurred in this past decade. With the arrival of inexpensive computer-assisted coding, live, real-time observational coding, or the rapid coding of videotapes, synchronized to computer-readable, video time-codes became feasible. Now, in the 21st century, an observer can code complex interaction between husbands and wives in real time and the com-

puter can later compute onsets, offsets, and durations of speaker/listener events, computer inter-observer reliability, and also perform sequential and time-series analyses that require knowledge of exactly when the events occurred. The merging of video and computer technology also has made it possible to time-synchronize the real-time acquisition of physiological and observational data from an interacting couple, and the use of video playback methods made it possible to time-synchronize spouses' perceptions and cognitions of the interaction. Thus, technology has made it possible to study, with time-synchronized data, the dynamic interplay between behavior, cognition, and physiology. Researchers discovered that the isolated study of behavior, cognition, or physiology without careful study of their interdependencies would severely limit being able to map findings onto the real interactional world of the couples we were studying. The relatively recent technical breakthroughs have narrowed the gap between couples' natural experience of their relationship and researchers' precise understanding of study participants.

Advances in understanding marriage stem not only from breakthroughs in technology but also from innovations in the methodologies used to extract information from the ongoing flow of interaction. Floyd (1989) reviewed research on the choice of coding units of different sizes and complexities. More and more interest was paid to developing global coding systems to capture targeted interactional processes. Basco, Birchler, Kalal, et al. (1991) developed and validated a rapid rating scale called the Clinician Rating of Adult Communication (CRAC). Bélanger, Sabourin, Laughrea, et al. (1993) compared macroscopic global coding systems (MICS-Global and the Global Couple Interaction Coding System) and decided that the convergence was moderate and

that it was premature to conclude that these macroscopic coding systems are interchangeable. Julien, Markman, and Lindahl (1989) presented a new global coding system and correlated it to the positive and negative codes of a more microanalytic Couples Interaction Scoring System (CISS). While negative codes between the two systems showed some convergence, the positive codes did not. Couples high in marital satisfaction reported higher Mutuality, while couples lower in marital satisfaction reported higher levels of Destructive Process, Coercion, and Post-Conflict Distress. Wampler and Halverson (1990) developed a Q-sort observational measure of marital interaction and they related it to their measures derived from the Couples Interaction Scoring System (CISS; Notarius, Markman, & Gottman, 1983).

A more powerful method of creating global categories from more microanalytic categories was a factor analysis reported by Heyman, Eddy, Weiss, and Vivian (1995), using 995 couples' videotaped conflict interactions with the MICS. The factors formed were: Hostility, Constructive Problem Discussion, Humor, and Responsibility Discussion. It is interesting that these super-categories are quite different from earlier suggestions for a global MICS system made by Weiss and Tolman (1990). An alternative approach to global coding was the work represented by the Gottman and Levenson laboratories, in which detailed microanalytic coding with multiple coding systems was undertaken (e.g., Gottman, 1994). This included the coding of facial expressions (the Emotion Facial Action Coding System, EMFACS; Ekman & Friesen, 1978), MICS coding, the development of a more rapid version of the CISS (RCIIS; Krookoff, Gottman, & Hass, 1989), and a Specific Affect Coding System (SPAFF; Gottman, McCoy, Coan, & Collier, 1996) that codes macro-levels of emotional expression (e.g., anger, sadness,

fear). This work has led to reliable micro-analytic, real-time observational coding of marital interaction in both conflict and nonconflict contexts. One advantage of coding specific affects is greater precision in studying positive affect. Gottman, Coan, Carrère, and Swanson (1998) found that positive affect was the only predictor of both stability and happiness in a sample of newlyweds. Finally, a more macro look across time at marital interaction was offered in a review by Christensen and Pasch (1993). They broke down marital conflict into seven stages, beginning with the precipitating event and evolving through the fight and then a return to normal.

Recently, there has been a more widespread application of sequential analytic methods for the quantitative study of patterns of interaction between two people over time, the use of time-series analyses, and the mathematical modeling of marital interaction. In two landmark articles published in 1993, Griffin (1993a,b) demonstrated an innovative approach for how event-history analysis could be applied to the study of insider evaluations of marital interaction. The first article described the methodology, and the second article applied it in a study of marital interaction. Couples had two conversations, a pleasant memories and a problem conversation, and then they engaged in a video recall of affect procedure. The self-rating of affect during the video recall were the data for the analyses. The dependent measure was the time until there was a transition out of negative affect. In a logistic regression, Griffin found substantial gender differences. Griffin reported that, consistent with the Gottman and Levenson (1986, 1988) hypothesis, wives maintained a negative affect state longer than husbands, particularly on the problem task. The wife's transition time out of negative affect was determined by the wife's education, her marital satisfaction,

and previous durations of negative affect. For husbands, the time already spent in a negative state determined the transition times out of that state; their exit behavior is less determined by their overall evaluation of the marriage than is the case for wives.

Griffin and Greene (1994) reported the results of analyzing one case of orofacial bradykinesia exacerbated during marital conflict. They used an interrupted time-series analysis to demonstrate that an increase of the symptoms followed a series of specific negative comments by the spouse in the conversation. Gottman et al. (1998) applied interrupted time-series analyses to their newlywed heart rate data to assess the extent to which a number of marital affective behaviors were either self-soothing or spouse-soothing; in a second step, they then used these data to predict marital outcomes 6 years later. As predicted by Gottman and Levenson (1988), only soothing of the male (primarily self-soothing) predicted positive marital outcomes.

We will focus the remainder of our review on what we see as the two primary advances recently made in the study of marital interaction. First, we examine how researchers have taken the fruits of cross-sectional, hypothesis-generating descriptive research and tested models for predicting the longitudinal course of relationships over time. These prospective studies were a major advance and their results demonstrate the maturation of the discipline. Second, we examine the empirical developments in several core content areas: 1) the study of power, 2) the exploration of marital interaction as a proximal determinant of individual well-being and distress, and 3) the study of interrelationships among interactional behavior, perception, and physiology.

THE STUDY OF COUPLES OVER TIME

Developmental Transitions

The family life cycle has been used to describe the natural history of couples over time. It is intuitively appealing to suppose that the interactional patterns characterizing the engaged couple, the newlyweds, the new parents, midlife couples, the empty nesters, the grandparents, for example, are stamped with unique qualities that determine if the couple is adaptively passing through these important and challenging transitions or not. Colloquially, couples expect the marriage to be different "once the honeymoon is over" and, empirically, we know that couples on the average experience a significant decline in satisfaction after the birth of the first child. Thus, it is encouraging to see that interactional researchers in the 1990s have begun to map the critical processes that define these developmental transitions.

Divorce prediction: Basic descriptive research during the 1980s paved the way in the 1990s for interactional research that can track the longitudinal course of marriages and can predict divorce. For a review of methodological issues, see Bradbury and Karney (1993). Gottman and Krokoff (1989) reported that a different pattern of interaction was related to concurrent marital satisfaction than to the change in marital satisfaction over time; for example, disagreement and anger were related to lower concurrent marital satisfaction, but also to improvement in marital satisfaction over time. Buehlman, Gottman, and Katz (1992) reported that, in a sample of families with preschool-aged children, their coding of an Oral History Interview was able to predict divorce or stability over a 3-year period with 94% accuracy, using a discriminant function analysis. The Oral History variables were also correlated in clear ways with Time-1

marital interaction in both problem solving and affect, the couple's physiological reactivity during marital interaction as well as Time-1 and Time-2 marital satisfaction. Gottman and Levenson (1992) reported the first prospective longitudinal study of divorce prediction that used observational data. They found that a couple's interaction and spouse's physiological responses observed at Time-1 were associated with a set of variables forming a cascade toward divorce. Couples starting on this cascade toward divorce at Time-1 had interactions that were marked by more negativity than positivity, and they rated their interactions more negatively upon video recall. Wives in these couples also had significantly higher heart rates and smaller finger pulse amplitudes (which could be part of a general alarm response in which blood is drawn into the trunk from the periphery). Subsequent work on the divorce prediction question with another sample of couples (Gottman, 1993, 1994) identified the ratio of positivity to negativity during the conflict discussion, and four specific negative interaction patterns (criticism, defensiveness, contempt, and stonewalling) as highly predictive of divorce. These findings were replicated with a third sample of newlywed couples (Gottman et al., 1998). In an independent replication and extension of the Gottman (1994) divorce prediction work, Matthews, Wickrama, and Conger (1996) reported that spousal hostility and lack of warmth predicted with 80% accuracy which couples would divorce within a year and with 88% accuracy which couples would be in the two most extreme marital groups. Furthermore, the observers' reports were related to marital instability both directly and indirectly through partners' perception of each other's behaviors.

Transition to marriage: Smith, Vivian, and O'Leary (1990) studied premarital

problem-solving discussions and predicted marital satisfaction at 18 months and 30 months after marriage. The negativity of the premarital interaction correlated with concurrent marital unhappiness but was not predictive of post-marital satisfaction. Controlling for premarital relationship satisfaction, affective disengagement during a premarital problem-solving discussion was negatively associated with marital satisfaction at 18 months and 30 months after marriage. Cohan and Bradbury (1997) examined the longitudinal course of marital satisfaction and depressive symptoms in newlywed marriages over an 18-month period. Problem-solving behavior mediated but did not moderate the relationship between life events and adjustment. In particular, angry wives had better adjustment to major and interpersonal events so that their depressive symptoms were reduced and their marital satisfaction increased.

Gottman et al. (1998) reported the results of a multimethod, longitudinal study predicting the eventual 6-year marital happiness and stability from newlywed interactions observed in the first months after the wedding. Seven types of process models were explored: (a) anger as a dangerous emotion; (b) active listening; (c) negative affect reciprocity; (d) negative startup by the wife; (e) de-escalation; (f) positive affect models; and (g) physiological soothing of the male. Support was not found for the models of anger as a dangerous emotion, active listening, or negative affect reciprocity in kind, either low or high intensity. Support was found for models of the husband's rejecting his wife's influence, negative startup by the wife, a lack of de-escalation of low intensity negative wife affect by the husband, or a lack of de-escalation of high intensity husband negative affect by the wife, and a lack of physiological soothing of the male, all predicting divorce. Support was also found for a contingent pos-

itive affect model and for balance models (i.e., ratio models) of positive-to-negative affect predicting satisfaction among stable couples.

Transition to parenthood: In 1957, LeMasters claimed that 83% of new parents went through moderate to severe crisis in the transition from being a couple to becoming parents. His claims were initially refuted and subsequently strongly debated by scholars. They were based entirely on the results of retrospective studies. Beginning in the 1980s, prospective longitudinal studies began to appear and they primarily confirmed LeMasters' claims (for reviews, see Belsky & Pensky, 1988; Cowan & Cowan, 1988). After 15 longitudinal studies, it is now generally accepted that the transition to parenthood is a stressful period for marriages, and because of decreased marital quality and parent-child interaction, a potentially stressful period for the development of the baby (Cowan & Cowan, 1995; Cowan, Cowan, & Kerig, 1993; Cowan, Cowan, Coie, & Coie, 1978). Recently, four landmark books were published that summarized key longitudinal research projects on the transition to parenthood (Cowan & Cowan, 1992 and Belsky & Kelly, 1994; Belsky & Rovine, 1990; Belsky, Spanier, & Rovine, 1983; see also Lewis, 1989; Michaels & Goldberg, 1988). There have been approximately 15 longitudinal studies on the transition to parenthood; many of the others were not prospective longitudinal studies. The longitudinal findings are remarkably consistent. Most have concluded that, for the overwhelming majority of couples this transition can be both extremely stressful and pleasurable. For approximately 40 to 70% of couples there is a drop in marital quality. In general, marital conflict increases by a factor of 9: people are at risk for depression; there is a precipitous drop in marital quality within one year after the birth of the first child; people revert to stereotypic

gender roles; they are overwhelmed by the amount of housework and childcare; fathers withdraw into work; and marital conversation and sex sharply decrease. There is also an increase in joy and pleasure with the baby. The longitudinal studies have all discovered the strong linkages between the pre-birth marital system (particularly highlighting the couple's conflict resolution skills, and a sense of we-ness), the parent-child system, and the baby's subsequent emotional/social and cognitive development. Belsky's study is a rich source of information for understanding the transition. The Cowans' study is the only controlled, preventive marital intervention study in the field. They demonstrated the powerful intervention effect of 24 hours of group supportive therapy during pregnancy in reducing the drop in marital satisfaction, preventing divorce, and improving parenting quality. However, by the time the child is 5, there were no differences between the experimental and control groups; it is still a mystery as to what happened to create relapse in the experimental group between years 3 ½ and 5. Lewis' (1989) landmark work defines very specific pre-birth marital "competencies" that provide links to child developmental outcomes through parenting.

Couples at mid-life and beyond: Overwhelmingly, the existing observational research on marriage has studied relatively young couples. The data that exist about older marriages have been limited to self-report data, derived primarily from questionnaires and interviews (Erikson, Erikson, & Kivnick, 1989; Guilford & Bengtson, 1979; Stinnett, Carter, & Montgomery, 1972). Although self-report data can be useful, they are well-known to have severe limits, especially when people are reporting very personal material. Amazingly, the only other studies that employed observational data are an unpublished dissertation by Illig (1977) and

a study by Zietlow and Sillars (1988) of couples from only one Lutheran church in Milwaukee.

In the 1990s, this state of affairs began to be remedied. Using an observational system for coding emotional behavior, Carstensen, Gottman, and Levenson (1995) studied the interactions of a representative sample of couples in their 40s or 60s as they attempted to resolve marital conflicts. With respect to negative emotions, the interactions of older couples were clearly less emotional than those of middle-aged couples. Older couples showed less anger, disgust, belligerence, and whining than middle-aged couples. With respect to the more positive emotions, however, the evidence was mixed. Middle-aged couples expressed more interest and more humor, but older couples expressed more affection. Importantly, these findings of lesser negative emotion and greater affection in older couples when discussing marital problems still held when the authors controlled for differences in the severity of the problems being discussed. The reports of the couples themselves were quite consistent with their behavioral coding. When they showed spouses the videotapes of their interactions and had them rate how they were feeling from moment to moment during the interaction, older couples indicated feeling more emotionally positive than middle-aged couples (Levenson, Carstensen, & Gottman, 1993, 1994).

THE CORE CONTENT AREAS

The Study of Power

In 1993, the late Calfred Broderick published an important book entitled "*Understanding family process*." Broderick organized family process literature, which he called "relational space," into three major areas, the *regulation* of interpersonal distance, the *regulation* of transactions, and the *regulation* of "vertical space," by which he meant power. The idea of "reg-

ulation" implied a homeostatic set point theory. In a therapy context, these three areas were respectively discussed as positivity/caring, responsiveness, and status/influence (Gottman, Notarius, Gonso, & Markman, 1976). We will briefly discuss these three areas. Historically, the regulation of interpersonal distance was first explored by examining the clarity of communication. Hypotheses were advanced to explore the role of unclear communication in dysfunctional families and family distress. More specific hypotheses were advanced that unclear communication was responsible for psychopathology (e.g., Bateson, Jackson, Haley, & Weakland, 1956; Watzlawick et al., 1967), and the cybernetic model or the systems approach to family process was born. However, subsequent research over three decades has shown that the regulation of interpersonal distance is all about *affect*, not about communication clarity (e.g., Gottman, 1993). So the field of family and marital process had been led very gradually toward the greater specification of emotional expression and experience, as we noted above. The regulation of transactions (e.g., signals of switches in speaking turns) has been studied with strangers (e.g., Duncan & Fiske, 1977; Jaffe & Feldstein, 1970) and has yet to be applied to the study of marital interaction.

The regulation of "vertical space," that is, the study of power, has been much more elusive. It remains an area of important activity, particularly as the study of physically abusive marriages became a major focus of research attention (e.g., Jacobson & Gottman, 1999). The empirical fabric of power always appears to disintegrate upon closer examination. Broderick (1993) wrote: Literally hundreds of studies have been done on family power, who wields it and at whose expense. The matter has turned out to be complicated and elusive. As a result, the scholarly literature on power is voluminous, complex,

and often contradictory (see Szinovacz, 1987). The great majority of these studies are based on questionnaires that ask the respondent to report on who wins the most contested decisions in his or her family. Critics have noted several problems with this approach (p. 164). Questionnaires filled out by independent observers do not correlate very well, nor are different measures well correlated (see Gray-Little & Burks, 1983); nor have patterns of domination proven stable over time (see Babcock, Waltz, Jacobson, & Gottman, 1993). An older article by Gray-Little (1982) is noteworthy because it combined the observational assessment of talk time during a 6-minute marital conflict discussion, and power during a marital game (the SIMFAM game, Straus & Tallman, 1971). Results were complex, but included the result that balance in husband-wife power was related to marital quality; however, self-report and observational measures did not show a high level of agreement in classifying couples. The issues of blending the study of affect and power are central to the integration of psychological and sociological approaches to marriage. As we will note, the issue of how to conceptualize and study power may become clarified either through the use of more precise observational measures or the use of more precise analytic techniques using data from two people that unfolds over time.

Power studied with more precise observations: An example of this approach to clarifying power is a recent study by Gray-Little, Baucom, and Hamby (1996). They assessed power more precisely, using a coding of the couple's influence patterns during a discussion of the Inventory of Marital Conflicts (IMC; Olson & Ryder, 1970). They found that egalitarian couples had the highest Time-1 marital satisfaction, fewer negative Marital Interaction Coding System (MICS) behaviors (Weiss, Hops, & Patterson, 1973); also,

wife-dominant couples improved the most in a 12-week marital therapy study.

Power explored in the context of gender and relational hierarchy: Feminist writers have pointed to the central role that power must play in understanding marriages. Quantitative observational research has also explored these ideas. Women typically start most of the marital conflict discussions in laboratories that use observational methods (Ball et al., 1995; Oggins, Veroff, & Leber, 1993). The degree of negative affect and the amount of criticism with which a conflict discussion starts is also critical in determining its outcome. In one study, for example, the way a marital conflict interaction *began* determined its subsequent course 96% of the time (Gottman, 1994; Gottman et al., 1998, p. 7). White (1989), in a sequential analysis using the Raush et al., (1974) coding system, found evidence for the contention that men display a more coercive style in resolving marital conflict, while women display a more affiliative style. Ball et al., (1995) reported that couples perceived women to be more important than the husband in the mobilization phase of problem talk, which involved raising the issues, planning on how to solve them, being active and taking control by silence and nonresponse. Husbands and wives both viewed this phase as the most stressful aspect of marital problem solving. Men were perceived as more influential in determining the content and emotional depth of later phases of the discussion. Women viewed their power in the early phases as illusory—"their behavior was shaped primarily by the effort to choose strategies that would avoid upsetting their husbands" (p. 303).

Coan, Gottman, Babcock, and Jacobson (1997) used sequential analysis to investigate the propensity of two types of physically violent men to reject influence from their wives during a marital conflict discussion. The sequence of escalation of the

negativity (from complaining to hostility, for example) was used to operationalize the sequence of rejecting influence. As hypothesized, abusive husbands whose heart rates decreased from baseline to the marital conflict discussion (labeled as Type-I abusers in the study), rejected any influence from their wives. These men were also generally violent outside the marriage and were more likely to have used a knife or gun to threaten their wives than abusive husbands whose heart rates accelerated from baseline to the conflict discussion (label as Type-II abusers in the study). These analyses were repeated for a representative sample of non-violent newlywed couples in the first few months of marriage, and the escalation sequence of men rejecting influence from their wives predicted subsequent divorce (Gottman et al., 1998). The sequence of women rejecting influence from their husbands did not predict divorce. This report was the first time that negative affect reciprocity was broken down into responding negatively *in kind* (e.g., anger is met with anger) or *escalation* (e.g., anger is met with contempt). Negative reciprocity *in kind* was characteristic of all marriages; only the escalation sequence was characteristic of marriages that were later to end in divorce. These findings reconceptualize negative affect reciprocity as the rejection of influence. More research is necessary to validate this suggested interpretation of the escalation sequence.

Power studied with the mathematical modeling of marital interaction: Power, according to Broderick (1993) "may be most simply defined as the ability to win contested decisions" (p. 164). However, an alternative definition has recently emerged using mathematical modeling of marital interaction. This alternative definition defines power quantitatively as the ability of one partner's affect to influence the other's affect. In this modeling (Cook et al., 1995; Gottman et al., in press) two

influence functions are computed across the affective range of a conversation, one for the husband's influence on the wife, and one for the wife's influence on the husband. This approach to modeling is based on writing down two interlocking nonlinear difference equations for husband and wife, with *influence functions* computed after controlling for autocorrelation. The method has a venerable history in the marital field. Long ago, Anatol Rapoport (1960, 1972) suggested that two linear differential equations for husband and wife interaction could describe a marital system as escalating out of control, or being self-regulated. He never operationalized these variables or applied them to real data, and, unfortunately, his equations were linear, and linear equations are usually unstable. However, Cook et al. (1995), applying the new mathematics of nonlinear dynamic modeling (e.g., Murray, 1989), showed that, depending on the shape of the influence functions, couples can have several stable steady states or "attractors," which are self-regulating, homeostatic set points for the marital system. A homeostatic attractor is a point in husband-wife phase space toward which the interaction is repeatedly drawn, and if the system is perturbed, it will move back to the attractor. These influence functions describe the impact of one person's affect on the partner's subsequent affect. This determination is made across the range of affects in the husband-wife dialogue. The influence functions make the study of power more detailed and specific. Power may be specific to particular affects. Asymmetries in influence reflect a power imbalance, and they reported that these asymmetries were predictive of divorce.

Power and marital typologies: An important research monograph was published by Fitzpatrick (1988). In it she presented the results of a series of studies that combined observational data on marital interaction with questionnaire data.

She presented a typology of marriage from her analyses of ideology, communication, interdependence, and power dynamics in the marriage. Three main types emerged from her analysis: *Traditional* couples, who were high on conflict and highly interdependent, but who have a conventional ideology; *Separate* couples, who were low on conflict and low in interdependence; and *Independent* couples, who were high on conflict and high on interdependence, but who have an unconventional ideology. She also presented results on mixed types. Her work was another example of the integration of the study of power with marital interaction. In a monograph on what marital processes predict divorce, Gottman (1994) also presented a marital typology with three types, looking at interaction and influence, and his types appear to be similar to Fitzpatrick's types. On a conflict task Gottman's types were: *Validating* couples, who are high on conflict but wait a while in the discussion and ask questions before engaging in persuasion attempts; *Volatile* couples, who are high in conflict and engage in persuasion attempts immediately; and *Conflict Avoiding* couples, who are low in conflict and do not engage in persuasion attempts at all. All three types were equally likely to have stable marriages, but Cook et al. (1995) discovered that *mismatches in influence functions* between Gottman's types predicted divorce. The question remains as to what fundamental mismatches in typology are dysfunctional.

Vanlear & Zietlow (1990) correlated Fitzpatrick's couple typology, marital satisfaction, and relational control. "Relational control" attempts to capture the sequential communication of power or status between spouses (e.g., from assertion to dominance, from collaborative deference to submission). Across couple types, marital satisfaction was associated with interactions confirming equality between

partners (i.e., there was an absence of "putting" self or partner, up or down). More importantly, the study revealed an interaction effect between couple type and relational control on marital satisfaction. This finding, along with Fitzpatrick's and Gottman's, further encourages researchers to challenge a uniformity assumption holding that all distressed and nondistressed couples are alike in their reactions to specific interactional behaviors.

Demand-withdraw pattern and power:

Although the pursuer-distancer pattern was first identified and noted as a focus of clinical work by Virginia Satir (see "foreword" in McCann & Shannon, 1985), the pioneering research work quantifying this pattern was done by Christensen and his associates; he called it the demand-withdraw pattern (e.g., Christensen & Heavey, 1990; Sagrestano, Christensen, & Heavey, 1998). The Christensen wife-demand/husband-withdraw pattern does not imply that the wife is dominant in this interaction pattern. The husband's withdrawal could be driving the wife's demandingness, for example. In an innovative analysis, Klinetob and Smith (1996) continuously coded demand and withdraw behaviors for both husband and wife. Using bivariate time-series analysis, and controlling for autocorrelation, they assessed the direction of influence between demand-withdraw behaviors (and between withdraw-demand) in both husbands and wives. They found that in the wife-demand/husband-withdraw pattern, the overwhelming percentage of couples showed a bi-directional influence pattern (especially when it was her issue), with wife dominance as the next most frequent pattern. For the husband-demand/wife-withdraw pattern, once again a bi-directional influence pattern was most common, with husband dominance the next most frequent pattern (particularly when it was his issue). This was an elegant approach to the study of marital power.

Marital Interactions as Determinants of Family Well-Being

Historically, an important revolution took place in the study of family processes when interactional hypotheses were advanced to explain how specific family interactions were related to and perhaps responsible for an individual family member's psychopathology (e.g., Bateson et al., 1956; Watzlawick et al., 1967). This marked the beginning of a major conceptual shift away from individual personality as the primary determinant of personal well-being and distress and toward social interaction with significant others as among the most significant determinant of physical and psychological well-being. We will examine the evidence to emerge in the 1990s that represents the next evolution in this 30-year-old revolution.

Health and longevity: An outstanding review by Burman and Margolin (1992) crystallized ongoing work that the psychosocial quality of marriages is linked to mortality and morbidity. In searching for a mechanism for these linkages, they decided that the effect is indirect and non-specific. Previous research has identified strong links between marital quality and health (c.f. Burman & Margolin, 1992), and between being married and better health and longevity (e.g., Berkman & Syme, 1979; Berkman & Breslow, 1983). Research now indicates that marital distress is associated with suppressed immune function (e.g., Kiecolt-Glaser et al., 1987; Malarkey, Kiecolt-Glaser, Pearl, & Glaser, 1994), cardiovascular arousal (e.g., Brown & Smith, 1992; Ewart, Burnett, & Taylor, 1983; Ewart, Taylor, Kraemer, & Agras, 1991; Gottman, 1994; Gottman & Levenson, 1992; Levenson & Gottman, 1983, 1985), and increases in stress-related hormones such as catecholamines and corticosteroids (e.g., Kiecolt-Glaser et al., 1993). There is extensive literature

that indicates, that for men, marriage offers health-buffering effects (e.g., Berkman & Syme, 1979; Berkman & Breslow, 1983; Bernard, 1982; Burman & Margolin, 1992; Shumaker & Hill, 1991) and that women are more likely to experience health-related problems if the marriage is distressed (Ewart et al., 1991; Gaelick, Bodenhausen, & Wyer, 1985; Huston & Ashmore, 1986; Kiecolt-Glaser et al., 1993). Recently, researchers also broadened the search for associations between marital interaction and specific disorders. Many of these studies are somewhat weak in methodology but nevertheless point the way toward the benefits of more refined study.

Child outcomes: Recently, research has been rich in discovering linkages across interacting subsystems within the family, and to the child's peer relations as well. The mediating variable in many of these investigations is the concept of *emotional regulation* of arousal in children, variously defined. Marital conflict, distress, and dissolution are linked to problematic childhood outcomes including: depression, withdrawal, poor social competence, deleterious health outcomes, lower academic achievement, and conduct-related incidents (Cowan & Cowan, 1987, 1992; Emery & O'Leary, 1982; Forehand, Brody, Long, et al., 1986; Goldberg & Easterbrooks, 1984; Gottman & Katz, 1989; Hetherington, Cox, & Cox, 1978; Katz & Gottman, 1991, 1993, 1995; Peterson & Zill, 1986; Porter & O'Leary, 1980; Rutter, 1971; Whitehead, 1979). For example, Cummings and colleagues found that children exposed to angry inter-adult conflict tend to use negative behavior such as physical aggression to cope (Cummings, Zahn-Waxler, & Radke-Yarrow, 1984). El-Sheikh (1994) found that pre-school children from highly conflictual marriages displayed behavioral distress and heart rate reactivity when shown tapes of angry adult interactions. Brody, Arias, & Fin-

cham (1996) reported a link between conflict-promoting marital attributions (e.g., seeing one's partner as selfish) and ineffective parent-child communication, and to the child's attributions for negative parental behavior. Davies, Myers, and Cummings (1996) showed videotaped segments of adults engaged in brief verbal conflicts, with various endings, to two groups of children, 7-9 year olds and 13-15 year olds. They reported that emotionally harmonious endings were crucial in creating a sense of emotional security in both groups of children, regardless of whether the adults' conflicts were about adult or child issues. Explicit verbal resolution was unnecessary. Across both age groups, female children reported more fear while male children offered more task-oriented interventions. See also Davies and Cummings (1994) for an attachment-based theory of emotional regulation.

Margolin, Christensen, and John (1996), in a sequential analysis, reported that distressed couples showed greater continuance of tensions and more spillover, particularly from marital to parent-child interaction. However, there may at times be an inverse relationship between marital conflict and parent-child interaction. Mahoney, Boggio, and Jouriles (1996) found that mothers were more empathic toward their 4- to 10-year-old clinic-referred sons after an episode of marital conflict.

Gottman, Katz, and Hooven (1996) reported the results of a longitudinal study in which there were clear linkages between observed marital, parent-child, and child-peer interaction when the child was 4 years old. Furthermore, these linkages were mediated by the child's ability to regulate physiological arousal during parent-child interaction. These linkages predicted a range of longitudinal child outcomes, including child peer relations at age 8. The central concept of this research was "meta-emotion," which refers to the feelings and cognitions that parents had

about their own and their children's anger and sadness. Katz and Gottman (1993) found that two distinct and uncorrelated patterns of marital interaction were related to distinct child outcomes. A mutually hostile pattern (which predicted marital dissolution) correlated with child externalizing behavior, whereas a husband angry and withdrawn pattern correlated with child internalizing disorders. Katz and Gottman (1997) reported that variables that index a "coaching" meta-emotion philosophy buffer children from almost all the deleterious consequences associated with marital conflict and dissolution. Coaching parents are aware of their child's emotion, they listen empathically to the child's feelings, they help the child find words to express the emotion, and then they explore and implement strategies to deal with the emotion. There was a physiological substrate to this buffering effect. Katz and Gottman (1995) found that a central child physiological dimension, called "vagal tone," protected children from marital conflict. Broadly, vagal tone is related to the ability of the parasympathetic branch of the autonomic nervous system to calm the child down. The concept has become central theoretically for many researchers in organizing the bases for the infant's emotional and social development (e.g., Fox, 1994; Garber & Dodge, 1991; Thompson, 1994).

Rogers and Holmbeck (1997) reported that more frequent and intense interparental aggression was associated with greater adjustment problems for children. They identified cognitive appraisal strategies that were maladaptive for the children and also noted that peer social support could buffer the negative effects of marital conflict.

Once again, after a hiatus of many years, links are again being made between the marital relationship and child sibling relationships. For example, among children aged approximately 4 to 9 years,

Erel, Margolin, and John (1998) reported linkages between the wives' negative reports of the marital relationship, the mother-child relationship, and the older siblings' observed negative interaction. The younger siblings' negative interaction was linked with the mother-child and the differential mother-child interaction (across siblings). No such relationship was found for siblings' positive interactions.

Adolescent adjustment was also studied in the context of couples undergoing the transition to remarriage (Hetherington & Clingempeel, 1992). There were three groups of families: stepfamilies with a divorced custodial mother who was in the first months of a remarriage, families with a divorced custodial mother who had not remarried, and nondivorced families. Authoritative parenting was associated with positive adjustment of children in all family groups, but children in nondivorced families were more competent and had fewer behavior problems than children in divorced or remarried families. Nondivorced and remarried couples looked very similar on the observational measures. There was remarkable stability in marital interaction over time. However, in their chapter, Deal, Hagan, and Anderson (1992) noted that the new stepfather is in a tenuous position in his new family: "It may thus be that the primary difference between first marriages and remarriages lies not in the quality of the marital relationship but in the relative importance of the marital relationship within the whole family system" (p. 93).

Common co-morbidities: Research in this past decade firmly established that marital interaction is also strongly associated with a broad range of outcomes for family members. Although the direction of cause and effect between marital interaction and spousal or child well-being is often unclear, the strength and importance of these relations will surely be pursued in the 21st century.

1. Depression: Schmaling, Whisman, Fruzzetti, and Truax (1991) assessed the marital interaction behaviors associated with wives' depression. They found that active summarization by the wife was associated with fewer depressive symptoms and the absence of a diagnosis of major depression. Johnson and Jacob (1997) examined the marital interactions of control couples and couples in which either the wife or the husband was clinically depressed. Depressed couples were more negative than nondepressed, and couples with a depressed wife were more negative than couples with a depressed husband. McCabe and Gotlib (1993), in a study of depressed and nondepressed couples, reported that depressed wives became increasingly more negative in their verbal behavior over the course of the interaction, and they perceived the interactions as more hostile. After breaking the interaction into thirds, they found that only depressed couples were fairly immediately reactive to their spouse's behavior in the interaction.

Biglan, Hops, Sherman, et al. (1985) discovered an interesting set of interactions using sequential analysis, which led to an exciting flurry of theoretically based research. They examined the potential "function" of depressed and aggressive behavior in depression, using sequential analyses. They compared distressed and nondistressed couples, both of which included a depressed wife, with community controls. First, they found that the couples with a depressed spouse exhibited higher rates of depressive behavior than the community control couples. Second, using sequential analysis they also noted two additional patterns: (1) husbands of depressed wives in distressed marriages were less likely to behave aggressively following a wife's depressive behavior than were husbands of depressed wives in nondistressed marriages; (2) depressed wives in distressed marriages were less

likely than depressed wives in a nondistressed marriage to show depressive behavior after their husbands exhibited an aggressive behavior. These were exciting findings, suggesting that the marital system might be covertly maintaining depressive symptoms, and thereby suggesting the direction of the causal relationship between interaction and individual outcomes.

Biglan et al.'s (1985) study was criticized because the investigators had difficulty obtaining nondepressed distressed couples. Schmaling and Jacobson (1990) conducted the full design, crossing high or low marital distress with high or low depression. They did not find interactional patterns that were unique to depression, but did find that these marital patterns were due to marital distress rather than depression. Similarly, Nelson and Beach (1990) found that the suppression of aggressive behavior was an artifact of the number of months the couples had been discordant. Interestingly, these means were quite long: 65.0 months for the non-depressed discordant and 94.5 months for the depressed discordant couples. Greater suppression of aggressive behavior was associated with shorter durations of discord within both groups of couples.

2. Violence: There has been an impressive increase in observational research applied to the study of violent marriages. Burman and Margolin (1993) used sequential analysis to compare the re-enactments of physically aggressive, verbally aggressive, withdrawing, and nondistressed low-conflict couples. Physically aggressive couples were characterized by reciprocity of hostile affect and by rigid, highly contingent behavior patterns that were stronger and longer lasting than those of other couples. Nondistressed couples also reciprocated hostility, but were able to exit these negative interaction cycles quickly. These sequential results were also obtained by Cordova, Jacobson, Gottman, et al. (1993)

for actual marital conflicts in the laboratory rather than re-enactments of conflicts at home. These investigators designed elaborate procedures to guarantee the safety of the abused women following actual marital conflicts in the laboratory. The data suggest that violent couples are missing an exit or withdrawal ritual from either reciprocated or escalating hostility.

Gottman, Jacobson, Rushe, and Shortt (1995) reported a typology of batterers based upon heart rate reactivity. Two types of batterers were identified: Type-1 men, who lowered their heart rates from baseline to a marital conflict interaction, and Type-2 men, who raised it. Compared to Type-2 men, Type-1 men were more violent outside the marriage (to strangers, co-workers, friends, and bosses), were higher on antisocial and sadistic aggression personality scores, lower on dependency, and were more verbally aggressive toward their wives during marital conflict; wives responded to these men with anger, sadness, and defensiveness. Type-1 men were more likely to threaten their wives using a knife or gun, but both types had inflicted as much actual physical damage (for more detail see Jacobson & Gottman, 1999). In a subsequent article on divorce prediction, Jacobson, Gottman, Gortner, et al. (1996) reported that among their batterers, there was a high divorce/separation rate of 38%, and that two variables predicted the divorce with 85.7% accuracy: 1) husband dominance and 2) the wife's reports of his emotional abuse. During the Time-1 marital interaction, more husband's contempt, less husband humor, less husband neutral affect, more wife defensiveness, and less wife humor predicted divorce. Physiological reactivity variables in both husbands and wives at Time-1 also predicted divorce. As noted above, the research on violence in marriages has focused attention on the power aspects of marriage. In an unpublished dissertation, Rushe (1995) analyzed mar-

ital transactions in terms of power and control strategies and concluded that the violent marriage is basically engaged in a power struggle, which is reminiscent of the analyses carried out by Coan et al. (1997) on violent men rejecting influence from women. This notion of violence as a form of power struggle is distinctly different from the emphasis on anger management for batterers in the therapy literature. The power dimension of violence suggests a systematic use of violence to intimidate and control the abused wife, instead of periodic uncontrolled outbursts (see Jacobson & Gottman, 1999). Babcock et al. (1993) reported that violent couples were more likely than nonviolent distressed and happily married couples to engage in the husband demand/wife withdraw pattern. Also, within the domestically violent group, husbands who had less power were more physically abusive toward their wives. Power was measured by communication skill using a structured interview about previous arguments, marital power outcomes with the Who Does What scale (Cowan et al., 1978). Positive affect and social support in violent couples have been studied by Holtzworth-Munroe, Stuart, Sandin, et al. (1997). They found that, compared to nonviolent men, violent husbands in the Bradbury social support task (Pasch & Bradbury, 1998; Pasch, Bradbury, & Davila, 1997) offered less social support than nonviolent husbands. Instead, they were more belligerent/domineering, more contemptuous/disgusted, showed more anger and tension, and were more upset by the wife's problem.

3. Chronic Physical Pain: Romano, Turner, Friedman, et al. (1991) developed a methodology for the behavioral observations of chronic pain patients and their spouses. Pain and control groups could be discriminated with ratings of overt verbal and nonverbal pain-related behaviors. Spouses of pain patients showed more so-

licitous behavior than control spouses. Turk, Kerns, and Rosenberg (1992), however, reviewed evidence that suggested the complexity of the problem: positive attention from spouses to displays of pain were associated with reports of more intense pain, higher observed pain frequency, and greater disability; but, negative spouse responding to pain was associated with increased affective distress.

4. Hostility and Type-A Personality: Sanders, Smith, and Alexander (1991) reported a relationship between marital hostile/dominant behavior and Type A or Type B personality pattern in both husbands and wives. Brown and Smith (1992) found a strong relationship between hostility during marital interaction and heart rate reactivity.

5. Alcohol Abuse: Jacob and Krahn (1987) used three different analytic methods to cluster the marital interactions of 96 couples (with the MICS) in which the husband was either alcoholic, clinically depressed, or a normal control. Cluster analysis revealed that there were three salient dimensions of the behaviors: Negative Evaluation, Problem Solving, and Positive Evaluation. Jacob and Leonard (1992) performed a highly detailed sequential analysis of these marital interactions. They found that couples with a depressed husband were different from the normal controls and couples with an alcoholic husband; couples with an alcoholic husband and normal controls were characterized by *similar* interaction patterns. Negative reciprocity was lower among the couples with depressed husbands, and husbands were less likely to follow their wives' problem solving with problem solving of their own.

6. Drug Abuse: Fals-Stewart and Birchler (1998) used their macro-CRAC coding system to study the marital conflict interactions of couples with drug-abusing husbands, and a well-selected control group of nonsubstance abusing,

but distressed couples. They thus controlled for distress and varied only the active ingredient of drug abuse. No differences were found between couple types on the self-report inventories, but the couples with the substance-abusing husband interacted significantly differently than the distressed nondrug-abusing couples: they showed higher Abusiveness, lower Problem-Solving Skills, and more Attribution of Blame than the distressed non-drug-abusing couples. In addition, they found that the CRAC total score was negatively related to the husband's percentage of days abstinent during the year before entering substance abuse treatment.

INTERRELATIONSHIPS AMONG KEY DOMAINS

More recently, research has witnessed the *blending of multiple measurements with observational measures in one investigation*, which makes it possible to ask more sophisticated questions at the interfaces of these three domains. We reviewed the Notarius et al. (1989) methodology in their experimental investigation of Weiss's (1980) concepts of positive or negative sentiment override and Gottman et al.'s (1976) concept of editing. We suggested that these salient interactional processes can be studied only through a time-synchronized examination of the interface between behavior and perception.

Bradbury and Fincham (1992) reported the results of two studies. In study 1, maladaptive attributions were related to less effective problem-solving behaviors (coded globally with rating scales), particularly for wives. In study 2, a more detailed coding system was used, combined with lag sequential analysis (Bakeman & Gottman, 1997; Bakeman & Quera, 1995). In this study maladaptive attributions (controlling for marital satisfaction) were related to the reciprocation of negative partner behavior (hostility or rejection of partner's views). Attributions and behavior

were most strongly related for distressed wives. Miller and Bradbury (1995) found that maladaptive attributions were related to hindering problem resolution on two tasks, one a problem-solving and one a social support discussion. Attributions and behavior were more strongly related for wives than husbands, and for distressed than for nondistressed spouses; again showing that cognitive factors function to impair interaction. Vanzetti, Notarius, and NeeSmith (1992) studied specific and generalized expectancies that couples had for the outcomes of marital conflict interactions. Distressed couples expected fewer positive and more negative behaviors. Couples high on relational efficacy chose relationship-enhancing attributions more often than low-efficacy couples. Halford and Sanders (1990) used a video recall procedure to assess cognition of each partner during a problem discussion and a relaxed discussion. Both domains discriminated distressed from nondistressed couples; and negative behavior in the interaction could be predicted better by accounting for both past cognition and behavior than by relying on past behavior alone. Thomas, Fletcher, and Lange (1997), using a thought-stream video recall method pioneered by Ickes (e.g., Ickes, Stinson, Bissonnette, & Garcia, 1990), in a study of empathic accuracy, had couples review their own videotapes and describe their own and their partners' "on-line" thoughts and feelings. Partners' assumed similarity was related to marital satisfaction and the positivity of the verbal interaction. Mendola, Beach, and Tesser (1996) found that the responsiveness to one's partner's self-evaluations was associated with favorable marital interaction during a conflict discussion, whereas responsiveness to one's own self-evaluation was associated with unfavorable marital interaction. These findings may suggest a possible mechanism underlying defensiveness. Fincham, Gar-

nier, Gano-Phillips, and Osborne (1995) developed a new methodology for studying a couple's pre-interaction expectations and the "accessibility" of marital satisfaction. To operationalize accessibility, they used two computer tasks and measured response latencies to specific questions about the spouse or the marriage. Response latencies moderated the relationship between satisfaction and expected partner behavior for husbands. Since there is considerable complexity in studying each separate domain, it is not surprising that work exploring the interrelations that exist between behavior and cognition is not well advanced.

Physiology and Interaction

The use of physiological measures in studies of marital interaction has increased in the decade. Ewart et al. (1991), in a study of essential hypertension, investigated high blood pressure and marital conflict. They reported that "not being nasty matters more than being nice." This was based on the finding that, among women, supportive or neutral messages were unrelated to blood pressure, but hostile interaction and marital dissatisfaction were related. Among men, blood pressure was related only to speech rate. Levenson and Ruef (1992) reported a physiological substrate for empathy. They asked subjects to view a videotaped 15-minute marital interaction of a couple and to indicate how a particular spouse reported feeling. When the rater's physiological responses matched those of the target spouse being observed, the rater was more accurate predicting the targeted spouse's feelings. Gottman and Levenson (1992) combined physiological assessment with observational coding of interaction, specific affect, and the subjective evaluation of affect. Using an index based on the aggregate valence of all statements spoken during a speaker turn, two groups of couples were formed. The

speaking turns of regulated couples were characterized by a positive slope (i.e., speaker turns were generally characterized by positive affect) over the course of a conversation while the speaking turns of nonregulated couples were characterized by a negative slope (i.e., speaker turns were generally characterized by negative affect) for one or both spouses. Wives in nonregulated interactions showed higher levels of arousal than all other spouses and Gottman and Levenson speculated that this heightened arousal may play a role in the poorer health of wives in distressed marriages. Gottman et al. (1998), using interrupted time-series analysis, found that only husband's physiological soothing (via self-soothing or through wives' humor) predicted marital stability among newlyweds.

Smith and Brown (1991) related husbands' and wives' MMPI cynical hostility scale scores to two marital interaction conditions, one in which they simply discussed a problem area, and one in which they received rewards for trying to persuade their wives in a win-lose contest. In husbands, their cynical hostility scores in the win-lose condition was related to their own increased systolic blood pressure (SBP) and heart rate (HR) reactivity. Husbands' cynical hostility scores also were related to increased systolic blood pressure reactivity in their wives. Wives' cynical hostility scores were unrelated to their own or to their husbands' physiological responses. Brown & Smith (1992) reported that in this win-lose condition husbands' SBP increases were accompanied by increases in anger and a hostile, coldly assertive style. In wives this same interactive style occurred but it was not associated with their own elevated SBP.

MARITAL RESEARCH AGENDA FOR THE 21ST CENTURY

There is a need to extend this work to representative and international samples

as well as a need to integrate sociological and psychological methodologies. Psychological studies have relied on samples of convenience that have limited generalizability. A recent exception is Escudero, Rogers, and Gutierrez (1997), who, in a detailed microanalytic investigation also employing sequential analysis, studied marital interaction in Spain, comparing clinic distressed couples with nonclinic nondistressed couples. They used the Rogers relational coding system (Rogers, 1972), which directly codes power transactions, and the Couples Interaction Scoring System (Gottman et al., 1977) for coding affect. They found that clinic couples displayed more domineering, more negative affect, and a stronger association between one-up control and negative affect than was the case for nonclinic couples. Krokoff, Gottman, and Roy (1989) conducted the only random sample study of blue- and white-collar marital interaction known to us. They used Markov model sequential analysis of interaction. Among their findings, there was more negative affect and negative affect reciprocity for unhappy couples, regardless of occupational status. Blue-collar husbands displayed more negative affect than white-collar husbands. Job distress was able to account for this difference between blue- and white-collar husbands; white-collar wives, when unhappy, were more negative than blue-collar wives when they were unhappy. Zamsky (1997) compared the interactions of distressed and nondistressed, white and African American couples. Replicating interactional findings on more homogeneous groups, Zamsky found large differences between distressed and nondistressed couples, particularly for the negative, emotionally invalidating behaviors. Surprisingly, communication differences between couples were not attributable to factors of race, socioeconomic status, or any interaction between these variables and marital satisfaction.

Observational study of distressed and nondistressed couples continued in the 1990s to be used in international settings. In studies in Germany, Kaiser, Hahlweg, Fehm-Wolfsdorf, and Groth (1998) showed that a short-term psychoeducational program increased the frequency of self-disclosure, problem solving, acceptance, and nonverbal positive behavior, and decreased the frequency of criticism relative to a control group. Hahlweg, Markman, Thurmaier, et al. (1998) showed that many of the changes in communication behaviors following the short-term intervention were maintained through a 3-year followup. Gender differences have frequently been observed in studies with US couples (see Baucom, Notarius, Burnett, & Haefner, 1990), particularly concerning wives negativity, and similar differences were observed in the German samples. At the 3-year followup, wives in the treatment and control group were observed to display more nonverbal negative behavior and more self-disclosure compared to their husbands, and wives in the control group displayed more criticism than their husbands.

In a study of distressed and nondistressed Dutch couples, Van Widenfelt (1995) confirmed a pattern of interactional differences that have been replicated in several studies carried out in the United States. She defined interactional behaviors and found that nondistressed couples display significantly more statements to facilitate problem solving, to emotionally validate the partner, and to self-disclose thoughts and feelings, while distressed couples display significantly more statements to inhibit problem solving and to emotionally invalidate the partner. Van Widenfelt also observed wives in her Dutch sample to display significantly more statements that were emotionally invalidating of their husbands (e.g., criticisms, guilt inductions, character assassinations). Sequential anal-

yses revealed the interaction of nondistressed couples to be characterized by statements that facilitated problem solving that were followed by self-disclosure or emotional validation. In contrast, the interaction of distressed couples was characterized by a high frequency of emotional invalidation that was followed by statements that either facilitated or interfered with problem solving, but without any consequent emotional validation.

There is a need for more observation in naturalistic settings: Melby, Ge, Conger, and Warner (1995), in an elegant analysis, compared a marital discussion and a problem-solving task and reported on the importance of task in detecting positive marital interaction. However, there have been very few studies of marital interaction outside laboratory settings, and this is a direction that needs continuing exploration. An exception is Vuchinich (1985), who studied naturally occurring dinner-time disputes. He found that in 200 examples of conflict, 67% ended in standoffs in which no one yielded and the topic was dropped. In 33% of the conflicts the most frequent reaction was withdrawal, in which one person refused to continue the discussion. The reaction of submission, in which one person gave in or compromised was very rare. However, even if not naturalistic, laboratory observations may have validity, particularly if they can be shown to predict important marital outcomes. Older evidence shows that interaction in the lab underestimates differences between distressed and non-distressed couples, compared to tape recordings made in couples' homes (Gottman, 1979). More recently, Hayden, Schiller, Dickstein, et al. (1998) related the mealtime interactions of families to multiple levels of family assessment; the measures were strongly related to both mother and father involvement. The use of a marital interaction diary was pioneered in a study by Halford, Gravestock,

Lowe, and Scheldt (1992) in an attempt to discover the behavioral ecology of stressful marital interaction. For example, they found that most stressful interaction occurred in the kitchen during the weekdays and were associated with everyday life stresses; the most stressful interactions resulted from one partner leaving the scene.

There is a need for continued focus on sequences or patterns of interaction: Either using various tools of sequence analysis, or through the direct observation of sequences, the observational study of marital interaction expanded to the analysis of patterned communication. Probably the most important of these patterns was the investigation of the demand-withdraw pattern. Most commonly this is observed as wives demanding change (through emotional requests, criticism, and complaints) and husbands withdrawing (through defensiveness and passive inaction). Christensen and his students pioneered the study of this sequence (Christensen & Heavey, 1990; Sagrestano et al., 1998) and showed that this pattern was most likely when discussing a wife issue, and could be reversed for a husband issue (Heavey, Layne, & Christensen, 1993). However, since a consistent finding is that women typically raise most of the issues in most marriages, this finding may be of only theoretical interest. Heavey, Christensen, and Malamuth (1995) demonstrated that the withdrawal by men and the female-demand/male-withdraw pattern predicted decline in wives' marital satisfaction 2.5 years later.

There is a need to recognize the importance of positive affect: Part of the accomplishments in the study of marital interaction over the last 20 years can be traced to the use of common methodologies and data analytic strategies in independent laboratories throughout the United States, in the Netherlands, Germany, and Australia. One feature of the

typical paradigm was a focus on conflict discussions and the negative behaviors that marked the interaction of distressed couples in this context. As we enter the next decade, interactional researchers are beginning to look beyond conflict to understand better the contribution that intimacy and other affectional processes make to relationship satisfaction and stability.

The importance of looking at positive affective reactions is suggested by several studies of marital interaction. Gottman et al. (1998) found that only positive affect during conflict discussions in the early months of marriage predicted both later divorce and the marital happiness of stable couples. Pasch and Bradbury (1998) and Pasch et al. (1997) studied social support in marital interaction using a task of only moderate conflict in which spouses discussed personal, nonmarital issues. Longitudinal data showed that wives' "support solicitation and provision behaviors" predicted marital outcomes 2 years later, independent of the negative behaviors exhibited during marital conflict. Beach, Martin, Blum, and Roman (1993) reported that co-workers and marital quality played a significant role in reducing negative affective symptoms (depression and interpersonal stress).

De Koning and Weiss (1997) studied the use of instrumental humor and found that it appears to function differently during the problem-solving conversations of younger couples married an average of 14 years than during the conversations of older couples married an average of 39 years. Among younger couples, instrumental humor was negatively associated with marital satisfaction, but among older couples, instrumental humor was strongly associated with marital happiness. The authors speculated that humor may function as an avoidance maneuver in the younger couples and more genuinely represent positive affect in the older

couples. Cordova (1998) is developing a promising behavioral model of intimacy. Intimacy is operationalized as a dyadic event sequence in which one partner's expresses a personal vulnerability and the spouse responds in an accepting, nonpunitive manner. Clearly the field is just beginning to explore the interactional basis of marital intimacy.

There is a need to revisit personality: Karney and Bradbury (1997), in a longitudinal study, examined the relationship between neuroticism, marital interaction, initial levels of marital satisfaction, and rates of change in marital satisfaction. They found that neuroticism was associated with initial levels of marital satisfaction but not with rates of change in marital satisfaction. However, behavior during marital interaction (total positive minus negative codes using Sillars' 1982 coding system) was associated with rates of change in marital satisfaction, but not with initial levels. Kobak and Hazan (1991), using an attachment theory framework with Q-sort methodology, reported that the accuracy of spouse's internal working models as relying on one's partner, and the partner being psychologically available, were both related to observers' positive ratings of communication in problem-solving and confiding tasks. Sayers and Baucom (1991) studied the relationship between femininity and masculinity and marital interaction using the MICS. Femininity was positively related to greater rates of negative behavior among both husbands and wives. A sequential analysis supported the idea that wives' femininity was associated with greater negative reciprocity of the wives. Men's femininity was associated with husbands' tendency to terminate fewer negative sequences of behavior in comparison to their wives. High masculinity of the wives was related to shorter sequences of negative behavior.

There is a need to study the management of stress spill-over into the marriage: In 1987, Jacobson, Schmaling, and Holtzworth-Munroe conducted a 2-year telephone followup study of the couples from their marital therapy study. They studied two groups of couples, those who maintained change, and those who relapsed. The only significant difference between the two groups was in the management of stress from nonmarital situations to the marital relationship. Couples who relapsed had more spillover of stress into the marriage than those who maintained change. A Swiss psychologist, Bodenman (1997a) reported that "dyadic coping" with stress predicted longitudinal outcomes (stability and happiness) in a 2-year study of 70 Swiss couples. Bodenman has developed an intervention program focusing on dyadic coping with stress (Bodenman, 1997b). This is an area that needs greater development.

To close our review, we suggest that in the past century we learned to use a multimethod approach that honors the study of multiple channels of information (affective behavior, perception, physiology) as they unfold over time. This attention to detail about marital process has led to empirical breakthroughs in both the prediction and the theoretical understanding of marriages, and it has set a research agenda that will carry the field forward into the 21st century on a sound scientific course.

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