

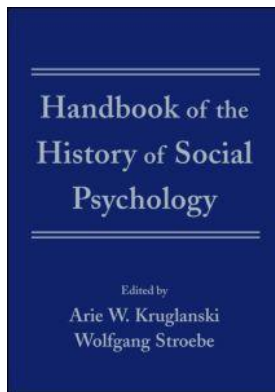
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### **A History of Interdependence: Theory and Research**

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# 16 A history of interdependence: Theory and research

*Paul A. M. Van Lange*

Most of the intense experiences are inherently social. Whether we feel we need to help others because we empathize with their unfortunate situation; whether we feel an urge to make a somewhat hostile or insulting remark (to let the other pay for some past offense); whether we feel guilty that we have not helped a needy other person; whether we feel somewhat bad about ourselves because we violated a strong norms of decency . . . It is not hard to fill the entire first page with intense experiences that are inherently social. Traits such as agreeableness or extraversion are inherently social; emotions such as guilt and shame are inherently social; and norms such as helping the poor (responsibility), sharing benefits equally (fairness), or being nice to those who have been nice to you (reciprocity) are inherently social. Indeed, much of life unfolds in the context of dyadic or group interactions, numerous human traits have their origins in interpersonal experience, and the source of many powerful norms can be identified in the interdependent situations for which those norms provide good adaptations. It is hard to come to terms with phenomena such as human cooperation, conflict, or trust without some basic understanding of social interaction and interdependence among people.

Indeed, classic writings have recognized that one essential feature of social experience is the *interdependence* among interacting persons. As Lewin (1948) noted, “The essence of a group is not the similarity or dissimilarity of its members, but their interdependence . . . A change in the state of any subpart changes the state of any other subpart . . . Every move of one member will, relatively speaking, deeply affect the other members, and the state of the group” (pp. 84–88). Therefore, to fully comprehend human behavior it is essential that we understand the nature and meaning of interdependence, defined as the process by which interacting persons influence one another’s experiences (i.e., the effects individuals have on other persons’ thoughts and emotions, motives and preferences, behavior, and outcomes).

Kurt Lewin is a natural starting point for a variety of themes within social psychology, and interdependence is no exception. In fact, one could go as far as to claim that he is the founder of interdependence, in that he was to first to define groups in terms of interdependence. As we will see, his influence on interdependence theory, as originally developed by Thibaut and Kelley (1959), was quite pronounced and enduring. But other frameworks, too, were inspired by Lewin’s emphasis on group

productivity, cooperation, conflict, membership, leadership, and the like. A case in point is Deutsch’s theory of cooperation and competition, in which he conceptualized promotive and contrient forms of interdependence, referring to situations with corresponding interests and conflicting interests, respectively (Deutsch, 1949, 1973). He also outlined the cognitive, motivational, moral, and action orientations that may be energized by promotive and contrient interdependence (Deutsch, 1982).

The concept of interdependence is very broad, and in principle could include nearly all classic themes in social psychology, especially those that emphasize social interaction. To illustrate, many domains in the *Handbook of Social Psychology* (Fiske, Gilbert, & Lindzey, 2010) have a direct and pronounced link with interdependence—examples are the chapters discussing person perception, emotion, personality in social psychology, evolutionary social psychology, morality, aggression, affiliation, close relationships, justice, status and power, social conflict, intergroup bias, social justice, influence and leadership, group behavior and performance, as well as cultural psychology.

Given the breadth of the concept of interdependence, the question arises: Where does one begin? What should be covered, what less so, and what not? Clearly, we need a comprehensive review of this history, but we also need a theoretical orientation; and we need a focus to get at the heart of interdependence. In my view, interdependence theory, as developed by Thibaut and Kelley (1959; Kelley & Thibaut, 1978) stands as the most comprehensive extant theoretical framework for understanding interdependence and social interaction. This is one reason why I will employ the constructs and principles of this theory to delineate the primary features of interdependence phenomena, and I will use this theory to describe the historical development of the interdependence domain over the past several decades.

But, at the outset, I should acknowledge the fact that several theoretical frameworks were developed around the same time. These frameworks influenced interdependence theory in many ways, just as interdependence theory influenced these frameworks. I already alluded to the work of Deutsch, but I should also note that in domain of social dilemmas alone, the goal–expectation theory (Pruitt & Kimmel, 1977), the structural goal–expectation theory (Yamagishi, 1986, 1988),

the individual–group discontinuity model (Insko & Schopler, 1998), formulations of game theory (e.g., Schelling, 1960), conceptual extensions of individual player games to team games (Bornstein, 2003), theories of direct reciprocity (Axelrod, 1984) and indirect reciprocity (Nowak & Sigmund, 2005) are important complementary frameworks.

But in other domains, too, there are various complementary frameworks, such as the need to belong model (Baumeister & Leary, 1995), the investment model of commitment processes (Rusbult, Agnew, & Arriaga, 2012), and the model of communal (and exchange) orientation (in close relationships, Clark & Mills, 2012), the empathy–altruism model (in altruism and prosocial behavior; Batson, 1998), realistic conflict theory (in intergroup processes; Sherif, Harvey, White, Hood, & Sherif, 1961), or the dual concern model of negotiation (Pruitt & Rubin, 1986). And if one goes a small step further by bringing to mind models and theories of justice, aggression, prosocial behavior, intergroup relations, and acknowledges that the concept of interdependence is widespread beyond the traditional boundaries of social psychology (e.g., economic markets, social preferences, international relations; for a review, see Gintis, Bowles, Boyd, & Fehr, 2005), the list would be truly immense.

Thus, I have decided to discuss the domain of interdependence in the tradition of interdependence theory (from Thibaut & Kelley, 1959; Kelley & Thibaut, 1978; to Kelley et al., 2003) for three reasons. First, as noted earlier, interdependence theory stands as one of the most comprehensive theories, with implications for a wide variety of topics. One reason why this may be so is that it advances a comprehensive taxonomy of situations from which one can understand a variety of

psychological processes, behaviors, and social interactions. Second, exceptions aside, most theoretical frameworks were often quite complementary to interdependence theory, and were developed at around the same time or shortly thereafter. Third, interdependence theory stands as an example of cumulative science, whereby the development was characterized by progress and growth, building on (rather than changing) the solid foundation provided by Kelley and Thibaut. It is therefore suitable as a theoretical framework for discussing the history of theory and research on interdependence in social psychology.

In discussing the history on interdependence, I start by providing a brief account of how Kelley and Thibaut initiated their collaboration. After that, I discuss the potential causes and influences relevant to the first book by Thibaut and Kelley (1959), followed by a discussion of the second book (Kelley & Thibaut, 1978), to conclude with the most recent book on interdependence theory (Kelley et al., 2003). While discussing each of these three books, I will consider some other prominent theories, models or lines of research that inspired interdependence theory, or were inspired by interdependence theory. (Note that Table 16.1 provides a brief overview of the historical development of interdependence theory).

### Historical development of interdependence theory

Obviously, the history of interdependence theory is strongly shaped by the longstanding collaboration and friendship between Harold Kelley and John Thibaut. At the outset, I should note that the more personal aspects of the development are written from the perspective of Harold Kelley (1921–2003), as

Table 16.1 Brief historical overview of interdependence theory

1959: Thibaut, J. W., & Kelley, H. H. *The social psychology of groups*. New York, NY: Wiley.

- Provides social exchange analysis of interactions and relationships individuals in dyads and small groups
- Uses games as a conceptual tool and focuses on analysis of dependence, power, rewards, costs, needs and outcomes in exchange relations
- Introduces new concepts such as comparison level and comparison level of alternatives (CL and CL-alt) to understand relationship satisfaction and stability

1978: Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. New York, NY: Wiley.

- Provides comprehensive analysis of interaction situations in terms of four dimensions, labeled as degree of dependence, mutuality of dependence, correspondence of outcomes, and basis of dependence
- Introduces transformation from given to effective matrix, thereby formalizing interaction goals broader than immediate self-interest
- Adopts a functional analysis of transformations, thereby recognizing social learning of transformation rules, and its functional value for particular domains of situation

2003: Kelley, H. H., Holmes, J. W., Kerr, N. L., Reis, H. T., Rusbult, C. E., & Van Lange, P. A. M. (2003). *An atlas of interpersonal situations*. New York, NY: Cambridge University Press.

- Provides an overview of 21 basic interaction situations, which are analyzed in terms of interdependence features, the psychological processes that they afford, and the interaction processes that they might evoke
- Extends the taxonomy of situations by two additional dimensions to yield six dimensions: (a) degree of dependence, (b) mutuality of dependence, (c) basis of dependence, (d) covariation of interest (formerly referred to as correspondence of outcomes), (e) temporal structure, and (f) information availability

*At present and in the future:*

- Interdependence theory is integrated with principles of evolutionary theory to understand adaptation as a function of the situational structure
- Taxonomy by differences in outcomes is extended: material versus personal
- Interdependence theory is extended to neuroscientific models of the social mind
- Interdependence theory is extended to group processes and relationships between groups

I had the privilege to interact on a regular basis with him but not with John Thibaut, who died at around the time I started my PhD research (1917–1986). As Harold Kelley told me, the collaboration between Thibaut and himself started when Kelley was invited to write a chapter on “group problem solving” for the *Handbook of Social Psychology*. Kelley invited Thibaut, whom he knew well from the Research Center for Group Dynamics at MIT, to collaborate on writing this chapter. This decision, so he described informally, was one of the very best in his academic career.

There was an interpersonal fit from the very beginning, and they wrote a beautiful chapter, inspired by some of the notions put forward by Kurt Lewin, in which they analyzed the interdependence between individuals in their pursuit of group goals (Kelley & Thibaut, 1954). Later Kelley and Thibaut stayed at the Center for Advanced Study in the Behavioral Sciences, which allowed (and stimulated) them to pursue ambitious goals (because of no interference of interruptions or deadlines) and to benefit from the presence and intellectual exchange of scientists such as Kenneth Arrow and Theodore Newcomb. The major themes—interdependence and social interaction—were discussed in a manner that was predictive of their later collaboration, one that lasted for three decades until the death of Thibaut in 1986. They developed a collaboration that was characterized by many travels between Malibu (University of California Los Angeles) and Chapel Hill (University of North Carolina), by deep friendship and tremendous mutual respect, by equality (they were both follower and leader), as well as by similarity and complementarity. To magnify the latter (for illustration purposes), the natural distribution of tasks was that Kelley focused more strongly on the analysis of situations, while Thibaut focused more strongly on connections with the various literatures inside and outside of psychology. They were also complementary in that Kelley’s interests focused more strongly on the dyad (later relationships) whereas Thibaut’s focused more strongly on the (small) group. This led to a wonderful friendship and collaboration for more than three decades, marked by two classic books: Thibaut and Kelley (1959) and Kelley and Thibaut (1978), which I will discuss in turn.

### ***The Thibaut and Kelley (1959) era***

After working together on a chapter for the *Handbook of Social Psychology* (Kelley & Thibaut, 1954), they planned to write a textbook on what they then called “the small group field” (Thibaut & Kelley, 1959, p. v). However, the end product was not a textbook at all. Although they covered a fair amount of empirical literature, they borrowed freely concepts of other disciplines, such as economics, learning theory and sociology, introduced some new concepts, and provided a logic to several phenomena—especially in the area of group dynamics. People often saw this book as contribution to “social exchange theory,” most likely because of the concepts they used, such as rewards and costs, resources, and several of the phenomena they discussed, such as power and dependence.

However, the framework that Thibaut and Kelley (1959) provided in and of itself should not be seen as a social exchange theory. One reason is that at the time when they published the book, Thibaut and Kelley felt that their book rested on concepts and assumptions that had an intuitive basis—they seem to “work” and “feel” right, in that they could account for the data, they were internally consistent, and they did not violate intuitions. The authors felt that the label “theory” should be reserved for a more formal theory with a more explicit “a priori conception.” By most contemporary standards, it should be noted that Thibaut and Kelley were modest in referring this book as providing a “framework” or “point of view” rather than a theory.

Another reason is that later formulations of their framework were broader than social exchange, as it also dealt with issues such as human coordination. As will be discussed later, coordination and exchange are two conceptually distinct phenomena that are rooted in different patterns of interdependence. Exchange is rooted in patterns of interdependence characterized by strong fate control (i.e., the unilateral control another person has over one’s outcomes) whereas coordination is rooted in patterns of interdependence characterized by strong behavior control (i.e., the joint control the other and the person have over one’s outcomes, such as optimizing sequences of actions). For example, exchange of favors is rooted in fate control, whereas the coordination of one’s actions, as in traffic situations, is rooted in behavior control.

These reasons help us understand why Kelley and Thibaut referred to their framework as a theory of interdependence only later, in 1978, when they published the book *Interpersonal Relations: A Theory of Interdependence*. However, in my view, the Thibaut and Kelley (1959) book should be regarded as a historical marker of interdependence theory, in that the conceptual basis—especially the notion of interdependence, and several key concepts—was advanced in 1959. Moreover, the book by Kelley and Thibaut (1978) complemented it in very important ways (as I will outline), but did not at all change the fundamental principles advanced earlier. Moreover, interdependence theory grew out of two classic theories—exchange theory and game theory—both of which at that time were innovative and exceptionally important frameworks for understanding interpersonal relations and group dynamics. We should also note that Thibaut and Kelley influenced social exchange theory in important ways, and later theorizing (Kelley and Thibaut, 1978) influenced game theory as well.

The book by Thibaut and Kelley (1959) was published more than half a century ago. As such, to understand the development of the theory advanced in this book, it is essential to understand the scientific thinking characteristic of that era. In the 1950s and 1960s, the *Zeitgeist* was strongly focused on *group dynamics*, with a strong emphasis on issues such as cooperation, power, and leadership. Indeed, many classic studies in social psychology are rooted in that intellectual climate and thematic focus, which undoubtedly were affected by the Second World War and the beginning of the Cold War. Indeed, as group

dynamics are very important to understanding the emergence and resolution of intergroup conflict, there must have been very little doubt about the relevance of issues such as cooperation, power, and leadership. Recall that this was also the time during which many complementary topics were initiated, such as research on conflict resolution, trust, and intergroup conflict. For example, Deutsch (1949, 1973) worked on his theory of conflict, cooperation and trust, Sherif and Sherif (1953) published their findings of the Robbers Cave experiments, and Osgood (1962) advanced a set of principles for understanding how one can effectively reduce conflict and warfare (graduated reciprocation in tension-reduction, or GRIT). These topics were especially timely in that they helped understand the development of the Cold War, and especially, how the examination of these topics might help us understand how international conflict could be managed and how peace and social harmony could be promoted. As an illustration, the well-known Prisoner's Dilemma, among other experimental games, was developed as a conceptual tool for the analysis of international conflict (see Kelley et al., 2003, for a discussion).

Indeed, the *Zeitgeist* of the 1950s and 1960s was also shaped by game theory, an orientation that centers on the analysis of preferences and outcomes for dyads and groups. In fact, early formulations of game theory (Von Neumann & Morgenstern, 1944) and later writings (e.g., Luce & Raiffa, 1959; Schelling, 1960) were influential—in economics, psychology, political science—at the time for a variety of reasons. First, game theory provided a very useful complement to extant economic theory, which was primarily based on macrolevel statistics that had not proved to be exceptionally useful for the prediction of economic stability and change. Second, game theory provided a “logic” that had a strong scientific appeal, analytical power, and mathematical precision. It helped scientists to analyze the economic crisis from the 1930s, and provide a basis for the understanding of various economical and social phenomena as well as to address the roots for conflict, and especially how to resolve conflict.

Interestingly, game situations were often used in designing policy and providing recommendations for the resolution of international hostility and friction. For example, basic insights from game theory were discussed and used by RAND Corporation (Research And Development), an influential organization and think-tank whose mission was to provide analysis and advice to military strategy by the United States. RAND Corporation is now more international in orientation and has several sites outside of the USA; also, it is now broader in scope in that it focuses on several key societal issues, including terrorism, energy conservation, and globalization.

In addition to game theory, another theoretical orientation that was influential at the time was social exchange theory, a framework that integrated key elements from reinforcement theory, behaviorism, and learning theory. In particular, just before the book by Thibaut and Kelley (1959) appeared, Homans (1958) published his important paper entitled “Social Behavior as Exchange” in the *American Journal of Sociology*.

In this paper, but even more so in his later book entitled *Social Behavior: Its Elementary Forms* (1961), Homans discussed the concepts of rewards and costs, how they may be provided by others in the form of resources, and how the maximization of rewards and the minimization of costs can explain much of social behavior. For example, one proposition that was inspired by learning theory read: “If in the past the occurrence of a particular stimulus-situation has been the occasion on which a man's activity has been rewarded, then the more similar the present stimulus-situation is to the past one, the more likely he is to emit the activity, or some similar activity, now” (Homans, 1961, p. 53).

An example of propositions that emphasized exchange stated: “The more valuable to a man a unit of the activity another gives him, the more often he will emit activity rewarded by the activity of the other” (Homans, 1961, p. 55). (“Value” here refers to the degree of reinforcement that is received from a unit of another's activity. “Cost” refers to the value obtainable through an alternate activity which is forgone in emitting the present activity. Profit = Reward – Cost. (The latter conceptualization was clearly inspired by the Thibaut and Kelley's concept of comparison level of alternatives, as I will discuss later.) And as a final example, Homans formulated another proposition, which linked interdependence experience to emotion: “The more to a man's disadvantage the rule of distributive justice fails of realization, the more likely he is to display the emotional behavior we call anger” (Homans, 1961, p. 75). In his theorizing, social behavior was assumed to be an exchange of material and nonmaterial goods. Examples of nonmaterial good are symbols of approval and prestige. For a person engaged in exchange, what she gives may be a cost to her, just as what she gets may be a reward, and her behavior is apt to change less as profit (or reward minus cost) increases. Later, in the 1970s, Homans (1974) realized that games could be a powerful tool to analyze social exchange processes (which might have been another influence of Thibaut and Kelley).

An earlier influence on interdependence theory was Homans' conceptualization of norms. He defined norms in terms of a statement or guideline as to what one ought to do under given circumstances and whereby any departure of behavior from the norm is followed by some punishment. This definition, which was closely related to Lewin's ideas about forces (see also Festinger, Schachter, & Back, 1950), was well appreciated by Thibaut and Kelley, who adopted a similar definition. As a side-note, it is interesting that in recent research the idea of norm violation, and punishment, has received renewed empirical interest—in particular, research on altruistic punishment and reward as means to obtain cooperation in groups (e.g., Fehr & Gächter, 2002), which was strongly influenced by earlier work by Toshio Yamagishi (1986) a sociologist, who studied *instrumental* cooperation—that is, the instrumental efforts of people that promote cooperation in a group, such as the support for systems that punish norm violators and non-cooperators (e.g., the implementation of a tax system in a society or organization).

*What did Thibaut and Kelley (1959) contribute?*

A *first* contribution of the book by Thibaut and Kelley was that they provided a much-needed logic to the active lines of research focusing on social influence, norms, power, conflict, leadership, and the like. They provided definitions of some key concepts, such as reward, costs, and power. But importantly, they provided a theoretical analysis of two key concepts: outcomes and interaction. First, they defined the concept of *interaction* in terms of individuals emitting behaviors in each other's presence, creating products for each other, or communicating with each other (Thibaut & Kelley, 1959, p. 10). As such, interaction involves the potential for unilateral or bilateral influence—the possibility that an individual's (or a group's) behavior will affect the behavior or experiences of another individual (or group of individuals). Second, they defined *outcomes* in terms of costs and rewards. Above and beyond actual outcomes, Thibaut and Kelley also conceptualize a subjective component to outcomes. In particular, individuals' evaluation of interactions and relationships was assumed to be influenced by two internal standards that to some degree are socially defined—the comparison level and the comparison level for alternatives.

Comparison level (CL) is “the standard against which the member evaluates the ‘attractiveness’ of the relationship or how satisfactory it is” (Thibaut & Kelley, 1959, p. 21). CL represents the quality of outcomes an individual expects to obtain in a relationship, and is affected not only by the individual's own previous experiences but also by social comparison. In contrast, the comparison level for alternatives (CL-alt) is “the standard the member uses in deciding whether to remain in or to leave the relationship . . . [It] can be defined informally as the lowest level of outcomes a member will accept in light of available alternative opportunities” (Thibaut & Kelley, 1959, p. 21). CL-alt is influenced not only by the quality of specific alternative relationships that are available to an individual, but also by the desirability of the broader field of alternatives and the acceptability of noninvolvement, or autonomy.

A *second* contribution is the analysis of various psychological concepts in terms of outcome matrices—derived from game theory, as described above. And Thibaut and Kelley identified fate control and behavior control as two distinct types of power (or influence). Fate control refers to the unilateral control one person's behavior has over another's outcomes (independent of the other's own behavior). An example is when a colleague makes a flattering or slightly insulting comment on one's performance—the outcomes are totally controlled by other's comment. Behavior control refers to the joint control the two (or more) persons have through their behavior on a person's outcomes. An example is a conversation situation, where at one point in time, one should speak and the other not speak (if they opt for the same actions, the outcomes will be less good). Another form of control was termed reflexive control, which referred to a person's own control over his or her own outcomes—for example, when a person provides good

outcomes for himself or herself through effortful (versus effortless) preparations for a meeting.

Later, in Kelley et al. (2003), these three forms of control were termed actor control (for reflexive control), partner control (for fate control), and joint control (for behavior control). After some discussion, these terms were considered more suitable as they indicate more clearly where the control comes from: the actor, the partner, or both of them together. In addition to providing relatively clear definitions, Thibaut and Kelley were also able to conceptualize these constructs in terms of game situations. While game theory had emphasized different games, Thibaut and Kelley were able to translate important psychological concepts—reward and costs, power and control—into outcome matrices. These outcome matrices were for Thibaut and Kelley primarily conceptual tools, even though they were often used as empirical tools—they were popular tools of experimental study, such as the well-known prisoner's dilemma game, and now we see a renewed, strong interest in these games (e.g., research on the dictator game, ultimatum bargaining game, trust game) as they provide strong behavioral measures of cooperation, trust, fairness, etc. (see Gintis et al., 2005; Van Lange, De Cremer, Van Dijk, & Van Vugt, 2007).

A *third* contribution was the analysis of social interaction in terms of patterns of social exchange and other processes (e.g., coordination), along with conceptualization in terms of broad terms such as norms and rules to help us understand how individuals and groups may adapt to various patterns of interdependence. This analysis had implications for dyadic relationships, but also for broader group phenomena such as normative influence, coalition formation, and group cohesion. The analysis that Thibaut and Kelley provided was intended to be a functional analysis of social interaction phenomena. As they noted, “the central concern is with the solutions that must be found to problems created by interdependency” (p. 5). As such, they were dealing with functions the individual has for the group, and the functions the group has for the individual. This functionalistic approach was important to providing a framework for power and status, coalition formation, normative and informational influences underlying conformity, and several other issues, whereby the focus was that, in the final analysis, group functionalism becomes an individual functionalism. This was similar to a Lewinian approach, which defines the group in terms of interdependence (not mere similarity or dissimilarity).

Thus Thibaut and Kelley, like Lewin, analyzed dyads and groups in terms of their goals, analyzed how they sought to reach such goals by examining the patterns of interdependence among the members of a dyad and group, and outlining how people may adapt to patterns of interdependence as individuals and groups. To illustrate, they analyzed which coalitions might become likely as a function of the interdependence structure in a group, and suggested that coalitions are more likely if the interests align with certain members of the group to form a coalition, but not with other members of the group. Just as they analyzed coalition formation, they provided an analysis of

topics such as conformity to norms and the function of roles in a group. For example, they outlined the important difference between task functions (i.e., the completion of the task) and maintenance functions (keeping the group together), which was later conceptualized in terms of two types of leadership (i.e., task-oriented leadership and social-emotional leadership).

### *Influences of Thibaut and Kelley (1959)*

Just as social exchange theory advanced by Homans and others influenced Thibaut and Kelley's writing, so did the latter influence subsequent accounts of social exchange. This included not only Homans (e.g., 1974) but also theoretical, exchange-based analyses of power and influence (e.g., Blau, 1964; Emerson, 1972), and theorizing of reciprocity (Gouldner, 1960). It was interesting to see that Thibaut and Kelley (1959), who devoted 10 chapters to dyadic relationships and five chapters to groups, was so influential on theorizing in sociology—Blau, Emerson, and Homans were all influential scientists in sociology. But it was primarily the conceptual analysis of rewards and costs, power and status, norms and roles that influenced sociological theory. Thus there were clear influences of Thibaut and Kelley (1959) on the macrolevel approaches of social behavior.

Kelley and Thibaut and complementary approaches (e.g., Deutsch) contributed to an intellectual climate in which other psychological theories were developed. A good example is the development of equity theory, a psychological theory of how people deal with underbenefit, overbenefit, and equity in social exchange. It complements the notion that people are simple reward-maximizers or cost-minimizers by emphasizing equity—the idea that the proportions of input (such as effort or accomplishments) and output (such as approval or salary) are equal for two partners (Adams, 1965). John Stacy Adams worked at the same university as John Thibaut (the University of North Carolina at Chapel Hill), but developed his theory while he was working for General Electric (Bell Laboratory). Hence, this theory was originally developed in the context of organizations to understand the psychology of costs and rewards. Later the theory became a powerful framework for understanding people's reaction to equity and inequity in the context of close relationships (see Walster, Walster, & Berscheid, 1978).

As such, equity theory is one of the justice theories that were later further developed by many other scientists, and received considerable empirical attention as well. These theorists primarily focused on allocation of outcome among people, which later was termed *distributive* justice (Deutsch, 1975). Not much later, theoretical work by Thibaut and Walker (1975) had an enormous influence on further theorizing about justice, in that they sought to understand the functions of the processes underlying distributions of outcomes. They asked questions such as what functions does it serve to give group members a voice in a particular outcome-relevant decision? Their theorizing emphasized *procedural* justice, the idea that the procedure for making outcome-relevant decisions—such as

whether to discuss a new way of distributing tasks, dull ones and interesting ones—often seems to be nearly as important as, if not more important than, the outcomes it provides. This area of procedural justice became a very important topic of research, because the notion that procedures matter to people was clearly supported in empirical research.

While Thibaut and Walker emphasized the instrumental value of procedure (they matter because they are outcome-relevant), subsequent research revealed that fair procedures yield important psychological benefits—or perhaps more precisely, that unfair procedures yield important psychological costs. That is, fair versus unfair procedures, such as whether people's voices were heard before an important decision, appeared to have pronounced implications for how strongly group members feel valued by the leaders, for people's feelings of self-esteem, as well as for cooperation and “extra-role behaviors” in groups and organizations (Tyler & Lind, 1992). Moreover, procedural justice has strong implications for comforting people and for reducing feelings of uncertainty about the outcomes and the self (see Van den Bos & Lind, 2002), as well as for feeling appreciated, for feeling treated well, and for the feeling that one is taken seriously. Undermining such feelings seems to be translated quickly into motivation loss (De Cremer & Tyler, 2005; Van Prooijen, De Cremer, Van Beest, Stahl, & Van Lange, 2008). The literature on procedural justice, with some of its roots in distributive justice theories and interdependence theory, was growing vastly around the turn of the century, through experimental research and research in organizations.

### *The Kelley and Thibaut (1978) era*

Nearly two decades after their initial book, Kelley and Thibaut (1978) published a second book entitled *Interpersonal Relations: A Theory of Interdependence*. As noted earlier, their initial book advanced definitions of key interdependence concepts—such as outcomes and interaction—and provided a conceptual framework for several group dynamic experiments on cooperation, cohesiveness, conformity, and the like. And this was exactly the aim of their first book. The second book did much more, and in my view, pursued a more ambitious goal. It presented (a) a taxonomy of patterns of interdependence, and (b) an analysis of the psychological antecedents and the ways in which the “objective structure” becomes transformed by personal values, motives, and the like to become a “transformed” or “subjective structure.” Kelley and Thibaut (1978) provided a taxonomy of four dimensions (or properties) of interdependence—which may be labeled now as degree of dependence, mutuality of dependence, corresponding versus conflicting interest, and basis for dependence. Because Kelley and Thibaut (1978) provided this taxonomy, they now felt comfortable in referring to this framework as “theory of interdependence,” and used it as a subtitle to their book.

Indeed, the development of a taxonomy of situations, based on deduction from experimental games, could or should be considered a major accomplishment—after all, a greater

understanding of situational structure was considered important for at least two broad reasons. First, structure in itself reliably influences behavior. For example, situations with structure resembling the *threat* situation reliably yield demand–withdraw patterns of interaction—demands for change on the part of the lower power actor, met by withdrawal and avoidance on the part of the higher power partner (Holmes & Murray, 1996). Situations with structure resembling the *chicken* situation reliably yield interactions centering on establishing dominance and sustaining one’s reputation (Nisbett & Cohen, 1996). And it is not easy to build trust in situations in which preferences are completely conflicting all the time. In short, the structure of situations often directly shapes behavior above and beyond the specific goals and motives of interacting individuals.

Second, specific structural patterns present specific sorts of problems and opportunities, and therefore (a) logically imply the relevance of specific goals and motives, and (b) permit the expression of those goals and motives. The term *affordance* nicely describes what a situation makes possible or may activate (see Table 16.2, which provides an overview of possible affordances). For example, situations with uncertain information afford misunderstanding, and invite reliance on generalized schemas regarding partners and situations; generalized schemas carry less weight when information is more complete. In short, situation structure matters because it is the interpersonal reality within which motives are activated, toward which cognition is oriented, and around which interaction unfolds.

#### *Dimensions of interdependence structure*

Because the four dimensions were so central to interdependence theory, I will briefly review each of these dimensions, and illustrate them with some examples of recent research. *Level of dependence* describes the degree to which an actor relies on an interaction partner, in that his or her outcomes are influenced by the partner’s actions. If Mary can obtain good outcomes irrespective of John’s actions (high actor control), she is independent; she is dependent to the extent that John can (a) unilaterally determine her pleasure versus displeasure (partner

control) or (b) in combination with Mary’s actions determine her pleasure versus displeasure (joint control). Increasing dependence tends to cause increased attention to situations and partners, more careful and differentiated cognitive activity, and perseverance in interaction (e.g., Fiske, 1993; Rusbult, 1983). As noted in Table 16.2, dependence affords thoughts and motives centering on comfort versus discomfort with dependence and independence. For example, high-dependence situations will activate Mary’s trait-based reluctance to rely on others, her discomfort with dependence will strongly shape her behavior, and her discomfort will be particularly evident to others; in low dependence situations, this trait will be less visible and less relevant for her behavior.

*Mutuality of dependence* describes whether two people are equally dependent on one another. Nonmutual dependence entails differential power—when Mary is more dependent, John holds greater power. The less dependent partner tends to exert greater control over decisions and resources, whereas the more dependent partner carries the greater burden of interaction costs (sacrifice, accommodation) and is more vulnerable to possible abandonment; threats and coercion are possible (e.g., Attridge, Berscheid, & Simpson, 1995; Murray, Holmes, & Collins, 2006). Interactions with mutual dependence tend to feel “safer” and are more stable and affectively serene (less anxiety, guilt). Situations with nonmutual dependence afford the expression of comfort versus discomfort with another having control over your outcomes (e.g., feelings of vulnerability, for the dependent partner) along with comfort versus discomfort with you having control over other’s outcomes (e.g., feelings of responsibility, for the powerful partner; see Table 16.2). For example, unilateral dependence will activate John’s insecurity, and his insecurity will powerfully shape his behavior and be highly visible to others; in mutual dependence situations his insecurity will be less visible and less relevant to predicting his behavior.

*Basis of dependence* describes precisely how partners influence one another’s outcomes—the relative importance of partner vs. joint control as source of dependence. With partner control, the actor’s outcomes rest in the partner’s hands, so

Table 16.2 The six dimensions of situational structure and their affordances (after Holmes, 2002; Kelley et al., 2003)

<i>Situation dimension</i>	<i>Relevant Motives</i>
1 Level of dependence	Comfort versus discomfort with dependence; and Comfort versus discomfort with independence
2 Mutuality of dependence	Comfort versus discomfort with vulnerability (as dependent) Comfort versus discomfort with responsibility (as power holder)
3 Basis of dependence	Dominance (leading) versus submissiveness (following) Assertiveness versus passivity
4 Covariation of interests	Prosocial versus self-interested motives (rules for self) Trust versus distrust of partner motives (expectations about others)
5 Temporal structure	Dependability versus unreliability Loyalty versus disloyalty
6 Information availability	Openness versus need for certainty Optimism versus pessimism



interaction often involves promises or threats as well as the activation of morality norms (“this is how decent people behave”); common interaction patterns may include unilateral action (when partner control is nonmutual) or tit-for-tat or turn-taking (when partner control is mutual; e.g., Clark, Dubash, & Mills, 1998; Fiske, 1992). In contrast, joint control entails contingency-based coordination of action, such that ability-relevant traits become more important, including intelligence, initiative-taking, and strategic skills; rules of conventional behavior carry more sway than morality norms (“this is the normal way to behave”; e.g., Finkel et al., 2006; Turiel, 1983). That is, joint control often calls for coordination, and setting aside the many good examples of human coordination (e.g., in traffic), it is interesting that coordination is sometimes quite challenging to dyads, and especially larger groups—a case in point is the productivity loss that is due to suboptimal coordination during brainstorm sessions (e.g., Stroebe & Diehl, 1994). Basis of dependence affords the expression of dominance versus submissiveness and assertiveness versus passivity, as well as skill such as social intelligence (see Table 16.2).

*Covariation of interests* describes whether partners’ outcomes correspond versus conflict—whether partners’ joint activities yield similarly gratifying outcomes for John and Mary. Covariation ranges from perfectly corresponding patterns through mixed motive patterns to perfectly conflicting patterns (zero-sum). Given corresponding interests, interaction is easy—John and Mary simply pursue their own interests, simultaneously producing good outcomes for the other. In contrast, situations with conflicting interests tend to generate negative cognition and emotion (greed, fear) and yield more active and differentiated information-seeking and self-presentation (“can Mary be trusted?”; e.g., Surra & Longstreth, 1990; Van Lange et al., 1997b). Situations with conflicting interests afford the expression of cooperation versus competition and trust versus mistrust (see Table 16.2)—in such situations, John may demonstrate his prosocial motives as well as his trust in Mary. This dimension was uncovered by Deutsch (1949, 1973) at around the same time, and described as promotive and contrient forms of interdependence.

### ***The Zeitgeist at the time of Kelley and Thibaut (1978)***

There were various research programs that started during the 1970s and that influenced, and were influenced by, interdependence theory. At least two major developments need to be discussed in that respect, namely (a) the research programs focusing on cooperation and social motives, and (b) the emerging field of relationship science.

#### *Social motives (later termed social value orientation)*

One such program of research started in the late 1960s at the University of California, Santa Barbara, where Charles McClintock and David Messick initiated research on social motives, as they were called at the time. It built on the work of

Thibaut and Kelley (1959), as well as on game theory (e.g., Luce & Raiffa, 1957) in which they sought to understand specific motives underlying interpersonal behavior. They often examined interactions among strangers in game situations, such as the Prisoner’s Dilemma or the maximizing difference game, in which people were faced with the option to pursue relative advantage over others (with no absolute advantage) or not. In doing so, they uncovered a variety of interesting social motives, such as competition (the maximization of relative advantage over others), individualism (the maximization of own outcomes with little regard for others’ outcomes), and cooperation (the maximization of own and others’ outcomes; Messick & McClintock, 1968).

Later, perhaps inspired by justice theories such as equity theory, fairness was also found to be a very important social motive—that is, the minimization of absolute differences in outcomes for self and others. This program of research was important because it provided a conceptual approach to a very popular area of research. In social psychology alone, hundreds of studies were conducted on the iterated prisoner’s dilemma, where researchers addressed interesting questions but some of these questions were more strongly method-driven rather than theory-driven. Nevertheless, these studies have revealed effects of perceived characteristics of the other (e.g., race, gender, personality), effects of communication (e.g., differential effects for threats and promises), and effects of variations in the strategies adopted by the other person (e.g., Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988). Subsequent research also examined so-called *n*-person social dilemmas, which captured the conflict between self-interest and collective interest in groups rather than dyads. This line of research has uncovered a rich psychology that is rooted in people’s feelings of responsibility, accountability, efficacy, and other mechanisms that are relevant to people’s willingness to make a costly effort that benefits the group or collective (for a review, see Komorita & Parks, 1995; Messick & Brewer, 1983; Van Lange & Joireman, 2008).

This line of research on social values developed by Messick, McClintock, and colleagues, as well as some other programs focusing on negotiation (e.g., Pruitt & Lewis, 1975), exerted an important influence on Kelley and Thibaut’s (1978) interdependence theory. In particular, it inspired the concept of *outcome transformation*, the idea that people may not necessarily respond only to variations in the outcomes for self. That is, people may not only consider their own outcomes, but also (consciously or not) take account of the outcomes for another person. The key question was what kind of transformations, or decision rules, one could identify as an important interpersonal orientation that guided their behavior in settings of interdependence.

Interdependence theory describes four nonindividualistic orientations in terms of *outcome transformations*, delineating enhancement of joint outcomes (MaxJoint, Cooperation), minimizing differences between own and other’s outcomes (MinDiff, Equality), enhancing outcomes for other (MaxOther,

Altruism), enhancing relative advantage over others (MaxRel, Competition), and reducing other's outcomes (MinOther, Aggression). Specifically, it is assumed that given settings of interdependence (i.e., the given matrix) may be transformed according to these orientations to yield a reconceptualized scheme (i.e., the effective matrix), which is more strongly predictive of behavior and social interaction. The given matrix is typically a function of basic, but nonsocial, preferences, such as whether a person prefers movie *X* or movie *Y*. When two partners differ in their preferences, but want to go to the theater together, they may take account of broader preferences. Such broader preferences are inherently social, because the individual takes account of the partner's preferences, which then yields a reconceptualization of the given matrix. That is, through transforming the given matrix by orientations such as cooperation, equality, altruism, or competition, the individual constructs an effective matrix, which may account for how the individual seeks to solve this interdependence problem as well as how the two partners eventually reach a solution.

#### *Relationship science as an emerging field*

Another new development was the development of research on close relationships. While most past research on social interaction in dyads and groups has focused on strangers, there was also increasing empirical attention to studying social interaction in the context of ongoing relationships. This literature grew out of initial studies on interpersonal attraction (e.g., Berscheid & Walster, 1978) to relationship development, and processes that were associated with relationship satisfaction and stability (Huston & Levinger, 1978). The study of close relationships was initially affected by a taboo against their systematic study ("relationships cannot be studied scientifically"), but at least two developments promoted this area of research. First, as divorce rates were increasing in several countries, the maintenance of relationships was considered to be a major life accomplishment. Second, it also became increasingly clear that having stable interpersonal relations was strongly associated with superior psychological and physical health. In 1983, a team of nine researchers of relationships edited a book entitled *Close Relationships* to provide a state-of-the-art review of the emerging science of relationships (Kelley et al., 1983). It discussed the central role of relationships in human life, the interdisciplinary origins of relationship science, methods as well as major topics such as love and commitment, power, roles and gender, conflict, and the like. But, as in Homans (1979) and Hinde (1979), interaction was considered to be the core of relationships. As Kelley and Berscheid noted in their new introduction to a republication: "Our central argument was (and still is) that at its core the study of relationships is the study of two persons' interactions with one another" (Kelley et al., 2000, p. xiii).

Since 1983, interdependence theory became one of the major theoretical frameworks for the study of relationships. The investment model of commitment processes (Rusbult & Agnew, 2010; Rusbult & Van Lange, 2003), the social relations model

(Kashy & Kenny, 2000), as well as methods for studying interaction (Ickes, Bissonnette, Garcia, & Stinson, 1990; Reis & Gable, 2000) were all strongly linked with interdependence theory, especially its emphasis on social interaction as the core of relationships. Other approaches, such as equity theory (Walster et al., 1978; see also Van Yperen & Buunk, 1991), the self-expansion approach (Aron & Aron, 2000), as well as the influential theorizing on communal and exchange orientation (Clark, Dubash, & Mills, 1998) are also closely linked to an interdependence theoretical approach. Indeed, the distinction between communal orientation (e.g., responding to another's person's needs) and exchange orientation (e.g., responding to violations of equality in exchanges) has its roots in the social exchange theory that we discussed earlier.

#### **Influences of Kelley and Thibaut (1978): The 1980s and 1990s**

As we all know, the 1980s and 1990s represented an era in which social cognition became central in social psychology. This era started with a strong emphasis on attribution, impression formation, and social judgment, and was then later extended to include various more specific social-cognitive phenomena, including processes such as attention, encoding, storing, retrieval, and recall of social information (Fiske & Taylor, 1984).

In many respects, key aspects of social cognition were addressed by interdependence theory. A case in point is Kelley and Thibaut's (1978) analysis and appreciation of *attribution* as a key cognitive activity for people to come to terms with another person's behavior (this was also important in analyses by Heider, 1958; Jones & Thibaut, 1958; Weiner, 1980). Attribution was considered important because people want to understand the transformational tendencies of other people: Did he behave cooperatively because his motives are oriented toward our joint outcomes, or might it be part of long-term strategy to enhance his own outcomes, perhaps at a cost to me? Attribution was important on the part of the observer or recipient. Kelley and Thibaut also outlined *self-presentation* as an important social-cognitive activity—that is, the way in which people communicate their motives to others through their actions. Attribution has had a strong influence in social psychology, in that numerous studies were conducted to examine the causes that people saw for interpersonal behavior. The influence of the concept of self-presentation was more modest.

Clearly, social cognition had a strong influence on lines of research that were initiated in the tradition of interdependence theory. For example, in research on social motives (later referred to as social value orientation), researchers started to study construal of interdependence situations. A key example is research on the so-called might versus morality effect, which stated that cooperative and noncooperative behaviors can be interpreted in terms of (a) morality, whereby cooperation is associated with goodness and noncooperation with badness, or (b) "might," whereby cooperation is associated with weakness and noncooperation with strength (Liebrand, Jansen,

Rijken, & Suhre, 1986). What this research further revealed was that people with prosocial goals were more likely to interpret mixed-motive situations, such as the prisoner's dilemma, in terms of morality versus immorality, whereas individualists and competitors tended to interpret these situations in terms of strength versus weakness (or in terms of intelligence versus stupidity; see Van Lange & Kuhlman, 1994). Also, people looked at a number of other social-cognitive processes, such as impression formation (De Bruin & Van Lange, 2000), the priming of constructs such as might and morality (e.g., Smeesters, Warlop, Van Avermaet, Corneille, & Yzerbyt, 2003), the use and recall of prosocial versus self-serving heuristics in negotiation (De Dreu & Boles, 1998), the strategic use of fairness in bargaining (Van Dijk, De Cremer, & Handgraaf, 2004), response latencies for making decisions in experimental games (Dehue, McClintock, & Liebrand, 1993), and evaluations of structural solutions to social dilemmas (e.g., Samuelson, 1993).

Generally, this research has revealed strong evidence for the thesis that people differ predictably in the goals that they bring to interdependence situations, and these goals prescribe the "frame" that people use to interpret situations and actions of others. These findings were often conceptualized in terms of the transformation-of-motivation concept, introduced by Kelley and Thibaut (1978). People who look at mixed-motive situations from the perspective of collective benefit and equality in outcomes (what is good for all) adopt a frame (a morality frame) that is quite different from those who look at mixed-motive situations from the perspective of individual benefit or relative advantage over others.

Clearly, research on close relationships was also influenced by interdependence theory as well as by the *Zeitgeist* of social cognition. As noted earlier, the influential program of research, initiated by Caryl Rusbult, on the investment model is a prime example. She studied the mechanisms by which people are able to maintain well-functioning relationships, with a strong focus on relationship stability (persistence). In her program of research, she identified behavioral as well as several social cognitive mechanisms, such as derogation of alternatives and positive illusions—the idea that people develop theories to "downplay" tempting alternative partners that might be "threatening" to the relationship (Johnson & Rusbult, 1989) and harbor positive illusions regarding one's own partner and relationship (e.g., Rusbult, Van Lange, Wildschut, Yovetich, & Verette, 2000). Similarly, Sandra Murray, John Holmes, and Nancy Collins developed a model of dependence-regulation, along with cognitive processes in the service of regulating dependence in ongoing relationships. The idea here is that people typically face a conflict between the desire for closeness and belongingness and the risk of rejection, and presumably, people adopt various regulatory mechanisms for coping with that kind of dependence. One striking example is that most people tend to idealize their partners, but at the same time should exert considerable effort at "assessing" the risks of dependence in ongoing relationships (Murray et al., 2006).

Another important approach was the notion, rooted in interdependence theory, that prosocial acts by one individual that are motivated by feelings of commitment (e.g., acts of sacrifice) may promote a partner's trust, which in turn may strengthen the partner's commitment and the reciprocation of prosocial acts (Wieselquist, Rusbult, Foster, & Agnew, 1999). This is an interdependence approach, because it is the departure of self-interest (i.e., prosocial transformations) that, when perceived as such, motivates similar acts of pro-partner behavior (such as sacrifice, or accommodation). In this type of analysis, social interaction is essential for the understanding of interpersonal trust (fed by a partner's departure of self-interest), for the growth and decline of commitment and relationship stability.

### **Kelley, Holmes, Kerr, Reis, Rusbult, and Van Lange (2003)**

In the meantime, it became increasingly clear that people with various topical interests were intrigued by some (or most) aspects of interdependence theory. For example, John Holmes had worked with John Thibaut at the University of North Carolina at Chapel Hill, and used principles of interdependence theory in his work on trust and conflict (as well as on dependence regulation and motivation management in relationships; Holmes & Rempel, 1989; Murray & Holmes, 2009). As noted earlier, Caryl Rusbult (also at UNC at Chapel Hill) developed the investment model of commitment processes, a framework that was deeply rooted in interdependence theoretic principles to understand persistence and commitment processes in ongoing relationships (see Rusbult & Agnew, 2010; Rusbult & Van Lange, 2003). I was intrigued by Kelley and Thibaut's taxonomy of situations ("structure") and transformations (what "persons" make of situations) and found it very useful for my research on social value orientation as well as for understanding the functionality of generosity in social dilemmas (see Van Lange et al., 1997a; Van Lange, Ouwerkerk, & Tazelaar, 2002). Norbert Kerr found an interdependence perspective useful for understanding group-related issues as diverse as motivation and performance, cooperation, and free-riding in social dilemmas (see Baron & Kerr, 2003; Kerr & Tindale, 2004). And Harry Reis not only had used interdependence theory in his research on intimacy and responsiveness in relationships (e.g., Reis, 2008; Reis, Collins, & Berscheid, 2000), but also had the vision and skills to get this group of people together at a joint meeting of SESP and EAESP in Washington in 1995. This resulted in a six-year-collaboration and eventually the publication of the *Atlas of Interpersonal Situations* (Kelley et al., 2003).

A major goal of Kelley et al. (2003) was to analyze a good number of interdependence situations in terms of their interdependence properties and their implications for goals and motives (transformation), as well as for likely interaction patterns. As such, the "atlas" extended Kelley and Thibaut (1978) in important ways, but perhaps most notably by analyzing 21 situations and by adding two dimensions to the four dimensions of interdependence that Kelley and Thibaut

already had previously identified. They extended the Kelley and Thibaut taxonomy by adding the dimensions of (a) temporal structure and (b) information availability (for an overview of the dimensions, see Table 16.2). There is little doubt about the relevance and necessity of these two dimensions, which we informally refer to as “time” and “information.” In the following, I discuss the merits and implications of these two dimensions in turn, in light of some basic research topics (i.e., persistence and generosity).

### **Temporal structure or the “time dimension”**

Temporal structure is a key part of interdependence situations, and essential to understanding social interaction. Although time was not strongly conceptualized by interdependence theory until 2003, it was a key variable in several lines of research. For example, the work of Mischel and colleagues (Mischel, 2012; Mischel, Shoda, & Rodriguez, 1989) on delay of gratification was clearly a situation in which people (children) needed to exercise control by resisting the temptation of direct reward to enhance greater rewards in the future. Also, investment situations are often situations in which someone needs to make some costs to build for the future. What is often observed in such lines of research is that people tend to engage in temporal discounting (or devaluing outcomes that are provided in the future) and that it takes “effort” to forgo short-term interests.

Temporal structure has also been considered important in the evolution of cooperation. For example, it has been noted that people are more likely to cooperate if they know that they are going to be interdependent for many more interaction situations. In his analysis of the so-called tit-for-tat strategy, the political scientist Axelrod (1984, p. 126) coined the phrase *shadow of the future* to suggest that people often cooperate because they foresee the rewards for cooperation and the punishments for noncooperation, and so adopt a longer-term perspective on the situation at hand. Also, game theorists have outlined that while noncooperation is rational in a social dilemma involving a single trial, cooperation is rational in a repeated-interaction social dilemma (Rapoport, 1990). And Kelley and Thibaut (1978) have also noted that a concern with long-term self-interest might promote cooperation at the outset of the interaction (e.g., sequential transformations). It is therefore perhaps not too surprising that scientists have distinguished between two temporal orientations, namely a present time orientation and a future time orientation that seem to predict many behaviors in situations where short-term and long-term interests are at odds (e.g., Joireman, Anderson, & Strathman, 2003). Research on social interaction in the laboratory often has looked at longer-term concerns within the scope of the duration of an experimental session, or even multiple sessions over a semester. Yet the time perspective is especially relevant to concerns that involve longer time periods.

An interesting case in point is the theorizing and research relevant to the phenomenon of *persistence*. Does interdependence

theory offer something unique in understanding persistence? Traditionally, persistence has been explained by reference to positive affect: People persevere in specific endeavors because they have positive explicit or implicit attitudes about the endeavor; people persevere in specific jobs or relationships because they feel satisfied with them (e.g., Ajzen, 1991; Greenwald, McGhee, & Schwartz, 1998). The affect construct has been operationally defined in terms of satisfaction level, positive attitudes, liking, or attraction. An important challenge to this “feel good” model of persistence (“so long as it feels good, I’ll stick with it”) is to be found in situations wherein people persevere despite the existence of negative affect. Clearly, people sometimes persevere even though they hold negative attitudes about behavior-relevant attitude objects; people sometimes stick with jobs or marriages despite feelings of dissatisfaction. Persistence in an abusive relationship is a particularly telling illustration: Surely people do not persist because they are delighted with such relationships. Some authors have sought to account for such inexplicable persistence in terms of trait-based explanations—by reference to a victim’s low self-esteem or learned helplessness (e.g., Aguilar & Nightingale, 1994; Walker, 2000). Inexplicable persistence is thus assumed to be an actor effect—people persevere because of something peculiar or unhealthy about themselves.

In contrast, an interdependence analysis explains persistence more broadly, by reference to the nature of an actor’s dependence. To the extent that people are more dependent on their jobs or relationships, they are more likely to persist in them; the greater their dependence on a distal goal, the more likely they are to persist in pursuit of that goal. In relationships, dependence is strengthened by increasing satisfaction (are important needs gratified?), declining alternatives (could important needs be gratified elsewhere?), and increasing investments (are important resources linked to the line of action?) (see Rusbult & Van Lange, 2003). For example, Mary may persevere in an abusive relationship not necessarily because she has low self-esteem or has acquired a pattern of learned helplessness, but rather for reasons resting on structural dependence—because she is heavily invested in remaining with her partner (e.g., she is married to John or has young children with him) or has poor alternatives (e.g., she has no driver’s license or possesses poor employment opportunities; Rusbult & Martz, 1995).

### **Information availability or the “information dimension”**

Information, and especially the lack of information, is essential for understanding social interaction. Clearly, information was addressed by Kelley and Thibaut (1978), especially in their analysis of self-presentation and attribution. These social-cognitive processes take place in many social interactions, and are logical implications of what people do in interdependence situations: we often want to present ourselves favorably (self-presentation) and often realize when we do not (e.g., when our actions harm others). Also, we often want to know what the

other is like (attribution), thereby relying on differences between the given matrix and the effective matrix (as noted earlier, personality, motives, intentions, and the like are revealed in disparities between the given matrix and the effective matrix). But still, the self-presentation and attribution processes had always been conceptualized (and largely examined) in the context of situations, in which people had *complete* information about (a) one another's preferences (e.g., implicitly assuming that one knows how the partner's outcomes are influenced when one considers attending a third conference in that year); (b) whether the outcomes we experience are always a product of the other's intended actions (e.g., unintended errors affect another's persons outcomes, noise).

Yet it is far more common that we have incomplete information about one another's preferences (see Vuolevi & Van Lange, 2010). For example, we often do not precisely know how much a person enjoys a particular joint activity that one considers (such as preferences for a movie or concert to attend), how much a person hates it when the partner has not fully completed the dishes, or how much a colleague appreciates a compliment on his or her new scientific paper. Also, noise or unintended errors are bound to happen in most social interaction situations. For example, when one is waiting for quite some time for a reply to one's email, it may be that the other is either unable (e.g., server breakdown) or unwilling (e.g., gave low priority to your email) to reply. Similarly, when one arrives late for an appointment, it is often hard to tell whether there were external constraints (e.g., unforeseen traffic jam) that prevented him or her from arriving on time. Thus, the addition of "information availability" to the dimensions of interdependence structure is useful from the perspective of comprehensiveness. For a situation-based theory, it is essential that one captures most situations and can characterize most situations in terms of their primary interdependence features. Another important benefit is that it opens new lines of research.

An interesting case in point here is research on the functionality of *interpersonal generosity*. Our example concerns the best-known and most thoroughly investigated interdependence situation, the Prisoner's Dilemma. Traditional analyses of situations with this structure have revealed that people enjoy superior outcomes over the course of long-term interaction when they behave on the basis of *quid pro quo*, or tit-for-tat (Axelrod, 1984; Pruitt, 1998): If an interaction partner cooperates, you should likewise cooperate; if a partner competes, you should compete. But how effective is tit-for-tat under conditions of suboptimal information availability—for example, when people are aware of how a partner's behavior affects their own outcomes, but are not aware of situational constraints that may have shaped the partner's actions? An interdependence analysis suggests that misunderstanding is often rooted in *noise*, or discrepancies between intended outcomes and actual outcomes for a partner that result from unintended errors (Kollock, 1993). For example, when John fails to receive a response to an email message that he sent to Mary, it may be because of a network breakdown in Mary's workplace rather than to Mary's

disregard for his wellbeing. Noise is ubiquitous in everyday interaction, in that the external world is not error-free (e.g., networks sometimes crash) and people cannot lead error-free lives (e.g., Mary may accidentally delete John's email note in her daily spam-purge).

Given that tit-for-tat entails reciprocating a partner's *actual* behavior—and not the partner's *intended* behavior—responding in kind serves to reinforce and exacerbate "accidents." If the accident involves unintended good outcomes, the consequences may be positive. But if the accident entails unintended negative outcomes, the consequences may be more serious. For example, when Mary's actions cause John to suffer poor outcomes, he may respond with tit-for-tat, enacting a behavior that will cause her poor outcomes. In turn—and despite the fact that she did not initially intend to harm John—Mary will react to John's negative behavior with tit-for-tat, causing him to suffer reciprocal poor outcomes. John and Mary will enter into a pattern of negative reciprocity: They can become trapped in an extended echo effect from which they cannot readily exit—an echo effect that tit-for-tat simply reinforces.

Indeed, research reveals that negative noise exerts detrimental effects when people follow a strict reciprocity rule—partners form more negative impressions of one another and both people suffer poorer outcomes (Van Lange, Ouwerkerk, & Tazelaar, 2002). In contrast, a more generous, tit-for-tat-plus-one strategy (giving the partner a bit more than one received from the partner) yields better outcomes—noise does not negatively affect partners' impressions of one another or the outcomes each receives over the course of interaction. Indeed, in the presence of negative noise, a generous strategy yields better outcomes for both people than does tit-for-tat (for more extended evidence, see Klapwijk & Van Lange, 2009). Such findings are reminiscent of the literature regarding interaction in close relationships, where partners have been shown to enjoy better outcomes in conflictual interactions when one or both partners accommodate or forgive (e.g., Karremans & Van Lange, 2008; Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991).

The societal implications of this interdependence analysis are quite powerful, as they suggest relatively concrete advice for people entering new situations at school, in organizations, and other situations where people interact in dyads and small groups. Under circumstances of imperfect information (which most situations are like) it helps to give people the benefit of the doubt, to reserve judgment, and to add a little of generosity to our tendencies to interaction in a tit-for-tat manner. The findings may also be especially relevant to the communication through email, internet and other electronic means, as these devices tend to be quite "noisy." But perhaps the use of smileys and other devices might just serve the important function of communicating trust and generosity for coping with noise.

### Present and future issues in interdependence theory

Historically, one primary inspiration to the emerging and rapidly growing discipline of social psychology was the realization that

Table 16.3 Overview of basic assumptions of interdependence theory

- 1 *The principle of structure (“the situation”).* Understanding interdependence features of a situation is essential to understanding psychological process (motives, cognition, and affect), behavior, and social interaction. The features are formalized in a taxonomy of situations, which are degree of dependence, mutuality of dependence, covariation of interest, basis of dependence, temporal structure, and information availability.
- 2 *The principle of transformation (what people make of “the situation”).* Interaction situations may be subject to transformations by which individualists consider consequences of own (and others’) behavior in terms outcomes for self and others and in terms of immediate and future consequences. Transformation is a psychological process that is guided by interaction goals, which may be accompanied and supported by affective, cognitive, and motivational processes.
- 3 *The principle of interaction, SABI:  $I = f(A, B, S)$ .* Interaction is a function of two persons (Persons A and B) and (objective properties) of the Situation. The Situation may activate particular motives and cognitive and affective experiences in Persons A and B, which ultimately through their mutual responses in behavior yield a particular pattern of interaction.
- 4 *The principle of adaptation.* Repeated social interaction experiences yield adaptations that are reflected in relatively stable orientations to adopt particular transformations. These adaptations are probabilistic and reflect (a) differences in orientation between people across partners and situations (dispositions), (b) orientations that people adopt to a specific interaction partner (relationship-specific orientations), and (c) rule-based inclinations that are shared by many people within a culture to respond to a particular classes of situation in a specific manner (social norms).

it takes personality *and* the situation to comprehensively understand human behavior (see Table 16.3 for a brief overview of interdependence theory’s major assumptions; see also Van Lange & Rusbult, 2012). Indeed, Lewin developed a model in which behavior ( $B$ ) is a function of the Person and the Environment,  $B = f(P, E)$ . Recent versions of interdependence theory (Kelley et al., 2003; Van Lange & Rusbult, 2012) extend this formula for social interaction ( $I$ ), which is stated to be a function of the situation ( $S$ ) and the two people in that situations ( $A, B$ ), hence  $I = f(S, A, B)$ . They typically refer to this model as the SABI model. In both formulas, the *Situation* is essential. As such, it is surprising that not much theorizing in social psychology is centered on the analysis of the situation. How two people adapt to the situation is the key to understanding social interaction from an interpersonal perspective. What do people make of situations? What motives are afforded by which situations? What patterns and sequences of interactions are likely to develop in which situations? It is a little surprising that, given the central role of “the situation” in social psychology and neighboring fields (and personality, as well), a taxonomic approach has not been exceptionally influential over the years.

In the 1998 edition of the *Handbook of Social Psychology*, in his chapter on the historic development of social psychology, Ned Jones made the following prediction about interdependence theory: “Given the elegance and profundity of this analysis . . . there is good reason that its impact will be durable” (1998, p. 30). Now, more than a decade later, it is clear that interdependence theory has influenced generations of scientists for more than 50 years. It is especially interesting to see that it has stimulated research in various domains of social psychology, including research focusing on within-person processes such as affect and cognition as well as between-person processes such as behavior and interaction in dyads and groups.

The historical impact of interdependence theory in shaping the broad field or domain of interdependence has been impressive. Indeed, as a classic theory, it has survived (and clearly, benefited from) various fashions, paradigmatic shifts, and even cultural influences—after all, interdependence theory has been

used by researchers in numerous countries around the world. At the same time, it is also fair to note that interdependence theory, having progressed from Thibaut and Kelley (1959) through Kelley and Thibaut (1978) to Kelley et al. (2003), has not yet become an exceptionally influential theory despite its interdisciplinary potential, and despite the fact that it helps address issues of relevance such as cooperation, conflict and fairness. Why could that be?

Briefly, we think there are two broad reasons. First, interdependence theory is a somewhat abstract theory. Unlike some other theories that can be communicated more effectively or efficiently, interdependence theory is not a theory about a psychological process that most people find easy to appreciate or recognize (e.g., the process of cognitive dissonance, the process of equity restoration, the idea of an automatic and reflexive system) or easy to translate into research. A theory that takes a taxonomic approach with six dimensions is not that easy to communicate in a few sound-bites, and might be somewhat more challenging to translate into experiments. Second, interdependence theory historically excels in abstraction and conceptualization. Indeed, the major contribution of Thibaut and Kelley (1959) derives from defining key concepts, and providing a somewhat abstract analysis of some dyadic or group processes. The “drawback” is that abstract frameworks generally tend to be difficult or effortful to translate into concrete, testable hypotheses.

The paradox is the following: It is a theory with a solid foundation—after all, there are not too many theories that are that mature and have passed several tests in more than one discipline. Also, using the same metaphor, one could argue that the theory “stands as a house” in many ways, especially since Kelley et al. (2003), which added time and information as key dimensions. But still, the theory needs to be made more “accessible” in terms of operationalizations or measurements of key constructs, a logic that is not only “true” but also has some more direct intuitive appeal, and a logic that implies some hypotheses that are ready to be tested. In what follows, I am not suggesting that one can address all of that at once. But at the very least, it is quite possible, or even likely, that some topics will become

important themes in the development of interdependence theory in the future.

### *Understanding situation selection*

I suggest that the taxonomy of situations proffered by interdependence theory should be employed to extend predictive specificity in classic domains of personality psychology, such as situation selection and person-by-situation interactions (cf. Mischel & Shoda, 1995; Snyder & Ickes, 1985). I illustrate this point using the example of situation selection. Clearly, life entails more than simply responding to the discrete situations with which we are confronted. Interactions and relationships unfold through situation selection—people change the structure of existing situations and choose to enter into new situations. Situation selection brings the actor, the partner, or the pair (or even an entire group) to a situation that differs from the previous situation in terms of outcomes, behavioral options, or both. For example, deciding whether to attend a conference, to sit close (or not) to an interaction partner, to quit working on a project, or to change the conversation topic illustrate situation selection.

The concept of situation selection has received relatively little attention in the history of psychology. Although classic writings by Lewin (1935, 1936) and Festinger (1950) included concepts such as movement and locomotion, these theorists focused primarily on movement and change within the context of a specific situation rather than movement among situations. Situation selection has received somewhat greater attention in recent decades (e.g., Buss, 1987; Mischel, 1999; Snyder & Ickes, 1985). However, contemporary approaches are mute with respect to the sorts of situations that people select. Given that interdependence theory offers a well-articulated taxonomy of situations, it can help us understand and predict the types of situation that people are likely to select.

For example—and relevant to the dependence dimension of interdependence structure—people may sometimes engage in situation selection geared toward modifying dependence, either reducing dependence (e.g., maximizing one's personal income) or enhancing dependence (e.g., making eye contact to signal interest). Needs, thoughts, and motives centering on independence, vulnerability, and responsibility are likely to explain situation selection involving changes in dependence (see Table 16.2). For example, people may quickly lower interdependence with people who tend to behave in a selfish manner, and may seek out greater interdependence with people that they trust to behave in a more cooperative manner (for evidence, see Van Lange & Visser, 1999). Relevant to covariation of interests, it seems clear that people often seek to reduce conflict by engaging in situation selection that increases correspondence (e.g., identifying integrative solutions); people may also seek enhanced conflict of interests (e.g., picking a fight, playing games).

Needs, thoughts, and motives centering on trust and prosocial motives are likely to explain situation selection involving changes in covariation of interests. Relevant to the temporal

dimension, people may seek to restrict (e.g., “I’m outta here!”) versus extend the duration of their involvement in a specific situation (e.g., long-term investment in a career), and may likewise seek to limit (e.g., abstaining from investment in a relationship) versus extend the extent of their involvement with a specific partner (e.g., committing “for better or worse”). Needs, thoughts, and motives centering on reliability, dependability, and loyalty are likely to explain situation selection involving temporal structure. And relevant to the information dimension, people may sometimes seek out or provide information in order to enhance information certainty (e.g., making oneself clear); people may also seek out or create attributionally ambiguous situations, allowing them to hide important properties of the situation or themselves (e.g., disguising one’s intentions or incompetence). Needs, thoughts, and motives centering on openness, flexibility, and optimism are likely to explain situation selection involving changes in information certainty (see Table 16.2).

Thus, it is one thing to recognize that people are not slaves of situational forces—that people select and modify situations in explicit or subtle ways. It is quite another thing to predict the character of situation selection. Interdependence theory provides insight in this respect, in that the dimensions underlying situations should reliably activate and afford specific sorts of goals and motives. Situation selection is often functional, in that it helps gratify specific needs or promotes long-term outcomes (Snyder & Cantor, 1998). But of course, situation selection may also initiate or sustain self-defeating processes. For example, shy children may avoid interaction, which in turn may limit their opportunities for overcoming shyness. The interdependence theory typology of situations can fruitfully be employed to extend predictive specificity in classic psychological domains, including not only the problem of specificity in predicting how traits relate to situation selection, but also specificity in predicting person-by-situation interactions (cf. Mischel & Shoda, 1995; Snyder & Ickes, 1985). As such, an interdependence theoretic analysis can advance precise predictions about the inextricable link between persons and situations.

### *Understanding material versus personal outcomes*

Interdependence theory focuses on “outcomes” as the primary concept that shapes patterns of interdependence. Indeed, outcomes are exceptionally useful to delineate the specific properties of interdependence—that is, the situation (the structure) to which two or more people adapt. Also, interdependence theory has used “outcomes” to define the ways in which people adapt to patterns of interdependence. For example, transformations such as maximization of joint outcomes, equality in outcomes, and the like are all transformation of outcomes. While it is reasonable that much of human motivation and adaptation is influenced by outcomes in a general sense, we suggest that it is theoretically enriching to distinguish between (a) material outcomes and (b) personal outcomes. Material outcomes represent results of actions and interactions that have

a high degree of universality and often reflect high degree of similarity between people—people appreciate money, free time, or activities they consider enjoyable (a particular movie) and so on, and such material outcomes are often in society translated into monetary value (e.g., income decline for a day not working; prizes for movie ticket). Personal outcomes represent results of actions and interactions that are more particularistic to the self and often reflect some degree of dissimilarity between people—for example, people may differ in terms of their orientation to gain social approval, status, and positive reputation.

The general distinction between material and personal outcomes is rooted in the classic work of Foa and Foa (1980). I want to re-emphasize the importance of the distinction for a variety of reasons. First, differences between material and personal outcomes underlie transformations. For example, people behave more cooperatively toward others if the others' outcomes are displayed in terms of self-related emotions (e.g., facial expressions that systematically differ in terms of sadness versus happiness) rather than monetary values (e.g., Grzelak, Poppe, Czwartosz, & Nowak, 1988). Second, it is plausible that interpersonal harm in terms of personal outcomes (e.g., insulting one's child in response to bad behavior) is often considered to be more psychologically aversive, and morally more inappropriate than interpersonal harm in terms of material outcomes (e.g., given less allowance in response to bad behavior). Third, in the context of groups, people not only pursue good outcomes for self, but often are willing to forgo such material outcomes if they can obtain reputation gain (an outcome that is particularistic to the self). For example, reputation as cooperative member increases one's status in a group, which is essential for understanding why people often keep track of one another's behavior, translate it into reputation, and why patterns of cooperation develop and persist even in fairly sizeable groups (Nowak & Sigmund, 2005).

Generally speaking, the distinction between material and personal outcomes becomes essential because it underlies transformations, seems intimately connected to cognition and affect, and resonates well with evolutionary approaches to human cooperation, which distinguish between (material) outcomes and reputation.

### *Understanding intergroup relations*

Most group phenomena are more complex than dyads—and often too complex for a comprehensive analysis, which is probably why Thibaut and Kelley often did not go beyond the triad. Nevertheless, the logic provided by interdependence theory has also considerable potential in analyzing intergroup relations. John Thibaut was more strongly focused on group processes than was Harold Kelley, and so the former was an important source of inspiration at the University of North Carolina to initiate theory and research on intergroup relations—in particular, Chester Insko. Indeed, this was quite new because social psychology had focused on processes within a group since the

group dynamic approach, but there was actually little empirical attention for processes *between* groups. This inspired John Thibaut and Chester Insko to initiate research on differences between interactions between individuals and those between groups (or sometimes representatives or leaders of groups; see Insko et al., 1987).

Chester Insko and John Schopler later turned this initial series of studies into a longstanding and impressive programmatic line of research on the individual–group discontinuity effect, in which they also analyzed differences between individuals and groups in terms of interdependence theoretical concepts (Insko & Schopler, 1998). For example, sometimes groups face high correspondence of outcomes, in that they both (or all) are pursuing the same goal and need each other in that pursuit. For example, neighboring countries help each other in their pursuit of controlling the use of hard drugs. Under such circumstances, groups may develop fairly congenial relationships, especially when they hold similar views about the policy for doing so. Sometimes groups face some conflict of interest, in the pursuit of some collective goal that is quite costly to each group. For example, countries want to control global warming, but they differ in their interest or views as to how much to contribute. Under such circumstances, groups are faced with social dilemmas (in the intergroup context, a conflict between ingroup interest and common, superordinate interests), and they often exhibit considerably less cooperation than do individuals in similar situations (Schopler et al., 2001). The primary reasons accounting for that effect are linked to the affordances of the interdependence situation. For example, some degree of conflicting interest challenges trust more (and enhances competitive motivation more) in interactions between groups than between individuals (for a meta-analytic review, see Wildschut, Pinter, Vevea, Insko, & Schopler, 2003). Indeed, there is a good deal of evidence that an interdependence approach complements other approaches (such as social identity and self-categorization approaches) in their predictions of intergroup relations.

John Thibaut also inspired Gary Bornstein, who was a graduate student at the University of North Carolina, in his game-theoretical approach to team games (Bornstein, 1992). These games specify the interdependence that might characterize relationships between individuals and their own group, as well as the interdependence that might exist between two groups. That is, they take an interdependence approach to analyze the patterns of interdependence between (a) the individual and their group, (b) the individual and the collective, and (c) the group and the collective (see Bornstein, 1992; Halevy, Bornstein, & Sagiv, 2008; Wit & Kerr, 2002). For example, a soldier (i.e., the individual) who fights forcefully often serves the group (i.e., his/her country), but not necessarily the world (i.e., the entire collective).

There is recent research to suggest that some biological processes, such as the external provision of oxytocin, promote not only trust and cooperative responses among members of the ingroup, but distrust and defensive responses to members of the



outgroup with whom they are interdependent (De Dreu et al., 2010; for earlier evidence regarding trust, see Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005). In such multi-layered social dilemmas, competition can be quite beneficial. When there are two (or more) well-defined groups that comprise the entire collective, then sometimes competition between the groups helps the entire collective. The competition should then deal with something desirable. For example, in The Netherlands, there is a contest between cities aiming for the award “Cleanest City.” As another example, two departments at a university may do better (yielding greater research output and enhanced teaching) if the university provides extra resources for only excellent departments. Indeed, organizations often use competition as a means to promote motivation and performance in individuals and groups of work units.

### ***Benefits of a taxonomic approach: Theoretical development in the future***

A unique and important contribution of interdependence theory is the advancement of a taxonomy of interpersonal situations. Indeed, there are very few theories in social psychology that advance a taxonomy of situations, even though social psychology as a field is strongly concerned with situational influence or influences from the social environment (see also Reis, 2008). Also, I believe that “dimensions” of temporal structure and information availability that have been added recently (Kelley et al., 2003) will prove to be important to several issues in psychological science and beyond.

First, much research and theory in social psychology focuses on processes in an attempt to understand “system-questions,” such as how cognition and affect might influence one another; the characterization of a dual process system, such as the reflective and impulsive system, hot and cool systems, and so on. We suggest that interdependence theory provides a much-needed taxonomy of situations that may help us understand when (i.e., the situations in which) particular systems might be activated. For example, forms of dependence call for trust, especially when there is some conflict of interest, and perhaps limited time might set into motion a hot system where impulses and gut feelings drive behavior rather than systematic thought (Hertel, Neuhof, Theuer, & Kerr, 2000; Kruglanski & Webster, 1996; for a review see De Dreu, 2010). An excellent case in point is the analysis of relationships between “the powerful” and the “the powerless” in organizations (Fiske, 1993). Because the latter are strongly dependent on the former, it becomes important to engage in deep, systematic processing in order to reach accurate conclusions about the motives and attributes of the powerful. In contrast, the powerful are less dependent on the powerless (and there are often many of the latter), the powerful are often more shallow and heuristic in forming impressions of the powerless—accordingly, they are more likely to fall prey to stereotypical information (Fiske, 1993).

Second, a taxonomic approach is essential to basic evolutionary issues. Because evolutionary theory focuses on the

question of how common human characteristics interact with the social environment, it is essential to have the theoretical tools to analyze social situations in terms of their key features (e.g., Schaller, Kenrick, & Simpson, 2006; Tooby & Cosmides, 2005; Van Vugt, 2006). Interdependence theory shares some assumptions with evolutionary approaches. One such shared assumption is that people, as individuals, partners, and as members of a group, *adapt* to social situations (Kelley & Thibaut, 1978). At the same time, while evolutionary theory tends to focus on common human characteristics, interdependence theory can make a contribution by specifying key properties of the social situation to which people adapt—the dependence, conflicting interest, information availability, and so on. According to interdependence theory, it is plausible that people develop consistent contingencies, which may take the form of “if . . . then” rules (Mischel & Shoda, 1999; see Murray & Holmes, 2009; Reis, 2008), in their adaptations to different partners in different social situations. For example, as outlined by Murray and Holmes (2009), if-then rules might reflect the way in which trust is communicated and commitment is built in ongoing relationships—partners’ sacrifices might be directly translated into trust. Thus, while evolutionary theory has focused on adaptations, such as coordination and cooperation, interdependence theory provides the conceptual tools for understanding the domains of the situations that afford the expression of the skills and motives relevant to coordination and cooperation. This contribution may be very useful for helping to understand why some cognitions and emotions are closely connected to particular domains of interpersonal situations.

Finally, we suggest that the taxonomy provided by interdependence theory will be exceedingly helpful as a model for integrating social and biological approaches to social behavior. Specifically, the taxonomic approach should contribute to our understanding of when and why particular neurological networks, hormonal responses, or complementary responses might be activated. These biology-based responses will often be adaptive in light of the qualities of both persons and the situation. For example, on the observer’s side, responses that are linked to anger are probably best understood when carefully analyzing another person’s violation of a norm in situations where people are likely to have somewhat conflicting preferences (e.g., Singer et al., 2006). It is especially striking that people with prosocial orientations tend to react highly automatically to a violation of equality (e.g., activation in the amygdala, Haruno & Frith, 2009). Such findings provide neuroscientific evidence in support of the integrative model of social value orientation, which states that prosocial orientation represents not only the tendency to enhance joint outcomes but also the tendency to enhance equality in outcomes (Van Lange, 1999). On the actor’s side, feelings of guilt might be evoked in such situations when we ourselves violate such norms (e.g., Pinter et al., 2007). In a related vein, interdependence theory could be extended to capture emotional responses and affect, especially as those processes give direction to our social interactions. Emotions such as empathy, gratitude, or anger are clearly of

great interest to understanding the neuroscientific and affective underpinnings of motives (such as altruism), human behavior, and social interactions (e.g., Batson, 1998; Van Lange, 2008). And the topic of self-regulation (and affect-regulation and self-control) in the interpersonal domain is of course strongly linked to inhibiting the temptation of self-interest and exercising self-restraint (e.g., Carver & Scheier, 2012; Mischel, 2012).

### Concluding remarks

Historically, one primary inspiration to the emerging and rapidly growing discipline of social psychology was the realization that it takes personality *and* the situation to comprehensively understand human behavior. The well-known formula by Lewin that behavior ( $B$ ) is a function of the Person and the Environment,  $B = f(P, E)$ , is extended by interdependence theory into a formula for social interaction ( $I$ ), which is a function of the situation ( $S$ ) and the two people in that situation ( $A, B$ ), hence  $I = f(S, A, B)$ . In both formulas, the *Situation* is essential. As such, it is surprising that not much theorizing in social psychology is centered on the analysis of the situation. By providing a taxonomy of interpersonal situations, interdependence theory has served that role from the very beginning, and extended it to provide a more comprehensive taxonomy of situations. The addition of new dimensions (temporal structure and information availability) to the well-established ones (dependence, mutuality of dependence, basis of dependence, covariation of interest) should be essential toward understanding (a) the motives and skills that are relevant to time in a general sense (e.g., investment, delay of gratification, consideration for future consequences, as well as issues of self-regulation and self-control), and (b) the nature and mechanics of (implicit) theories that people bring to bear on situations with limited information (e.g., the hot and cold systems, the degree of processing, the needs and motives involved, as well as the implicit theories by which people make incomplete information complete). There is good reason to believe that the taxonomy provided by interdependence theory has become quite comprehensive, although future conceptual work may well focus on complementing the taxonomy by analyzing some other features of interdependence (such as the degree to which outcomes are material versus personal).

In my view, a taxonomy of situations is essential for theoretical progress in social psychology and beyond. First, from a theoretical perspective, it is crucial that we know better what a situation “objectively” represents, because only then it is possible to understand what people subjectively make of a situation (construction). Conceptually, the constructs of given situation (objective situation), transformation (meaning analysis), and effective situation (subjective situation) represent the heart of the interdependence theory. It complements much other theorizing in social psychology, which tends to focus on the processes relevant to transformation and effective situation preferences.

Second, a taxonomy is important in that it helps us understand the situations that people might face (in terms of valence, frequency, and intensity), and how these features are associated with differences in personality, social class, gender, and age. For example, the frequency with which one faces situations of unilateral dependence on another person might increase from adulthood to old age. A taxonomy of situations also helps us understand the situations that relationship partners and members of small groups are likely to face (or not)—for example, how they face situations of conflicting interests. Family size might be linked to a situation of interdependence in which sharing is called for, and such experiences might help explain the development of prosocial orientation. As a variation of Lewin’s (1952, p. 169) well-known dictum, one might suggest that “there is nothing as practical as a good taxonomy.”

Thus, after more than 50 years, since Thibaut and Kelley (1959), interdependence theory comes full circle. It really has helped the field to get a grip on situations that interacting partners face or might face (the given interdependence situation), what they make of it (the transformation process) in terms of cognition and emotion, and how the structure and the processes shape human behavior and social interactions. This also helps to explain why interdependence theory has been well appreciated for over five decades, why it has grown, why it is one key example of cumulative science, and why it has been used to understand so many issues—group dynamics, power and dependence, social comparison, conflict and cooperation, attribution and self-presentation, trust and distrust, emotions, love and commitment, coordination and communication, risk and self-regulation, performance and motivation, social development, and neuroscientific models of social interaction. I am sure that many of us are looking forward to the theoretical contributions and implications of interdependence theory over the next 50 years.

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