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INTERPERSONAL CONFLICT AND ITS MANAGEMENT IN INFORMATION SYSTEM DEVELOPMENT[1]

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Abstract

Researchers from a wide range of management areas agree that conflicts are an important part of organizational life and that their study is important. Yet, interpersonal conflict is a neglected topic in information system development (ISD). Based on definitional properties of interpersonal conflict identified in the management and organizational behavior literatures, this paper tests a model of how individuals participating in ISD projects perceive interpersonal conflict and examines the relationships between interpersonal conflict, management of the conflict, and ISD outcomes. Questionnaire data was obtained from 265 IS staff and 272 users working on 162 ISD projects. Results indicated that the construct of interpersonal conflict was reflected by three key dimensions: disagreement, interference, and negative emotion. While conflict management was found to have positive effects on ISD outcomes, it did not substantially mitigate the negative effects of interpersonal conflict on these outcomes. In other words, the impact of interpersonal conflict was perceived to be negative, regardless of how it was managed or resolved.

Keywords: IS project management, IS project teams, user/analyst interaction, conflict resolution

ISRL Categories: EE, EE02, FD08, AA10

Introduction

Conflict is a pervasive phenomenon that permeates a multitude of organizational processes and outcomes. Its omnipresence and the importance of conflict management has been acknowledged in diverse fields including psychology, communication, organizational behavior, information systems (IS), and marketing (e.g., Deutsch 1990; Greenhalgh 1987; Pondy 1967; Pruitt and

Rubin 1986; Putnam and Poole 1987; Robey et al. 1989; Thomas 1976, 1992b; Wall and Callister 1995). Information systems development (ISD) represents a fertile arena where numerous symptoms of conflict have been identified including hostility and jealousy (e.g., Smith and McKeen 1992), poor communication (e.g., Franz and Robey 1984), a proliferation of technical rules, norms, and regulations (e.g., Franz and Robey 1984), and frustration and low morale (e.g., Glasser 1981). As Smith and McKeen noted:

> ...conflict is a very real part of IS in corporate life and a major obstacle to effective computerization...conflict appears between IS and almost all other departments in a wide variety of contexts....Lack of trust and understanding, hostility, and frustration with the other group are typical of these conflict relationships and these symptoms were evident between business managers and IS personnel....Some IS managers believe that users are hostile....On the other hand, business managers apparently feel that IS is not responsive to their needs and does not understand business needs (p. 55).

While deemed important, few ISD studies have examined interpersonal conflict, the management of this conflict, or the impact this conflict has on project outcomes (However, see Barki and Hartwick 1994b; Robey et al. 1989, 1993). Based on existing theory, the present paper develops and tests a conceptual model of interpersonal conflict, examines the relationship of conflict with approaches to its management, and studies their joint impact on ISD project outcomes. To provide a context within which to view the study, we first present a general framework of interpersonal conflict based on a review of the general conflict literature (e.g., Pondy 1967; Pruitt and Rubin 1986; Putnam and Poole 1987; Thomas 1976, 1992b; Wall and Callister 1995). This is shown in Figure 1.

Although vast, the interpersonal conflict literature shares a general structure whereby conflict is seen as a cycle (Wall and Callister 1995):

> As with any social process, there are causes; also, there is a core process, which has results or effects. These effects feed back to effect the causes (p. 516).

This general structure underlies the framework of Figure 1. Here, individual, team, project, and organizational characteristics are seen as contextual antecedents affecting both the level of interpersonal conflict and the various styles individuals adopt in managing ISD conflicts. The constructs of interpersonal conflict and conflict management are central to the structure of Figure 1. As shown in the figure, the level of interpersonal conflict that exists depends in part on the contextual antecedents and in part on the conflict management styles employed by the individuals on the project team. Similarly, the styles individuals employ depend in part on the contextual antecedents and in part on the level of interpersonal conflict present. In other words, individuals select different conflict management styles depending on the level of interpersonal conflict they perceive. As such, conflict is seen as a process whereby interpersonal conflict and management style affect one another. Finally, Figure 1 suggests that interpersonal conflict and style of conflict management will each affect a variety of individual, team, project, and organizational outcomes.

The present paper focuses on interpersonal conflict, styles of conflict management, and their impact on ISD project outcomes. In doing so, three general questions are addressed:

(1) What is interpersonal conflict and how can it be assessed?

(2) Is level of interpersonal conflict related to different styles of conflict management?

(3) Does level of interpersonal conflict and style of conflict management affect the outcomes of ISD projects?

Figure 1. Interpersonal Conflict in Development Teams: A General Framework
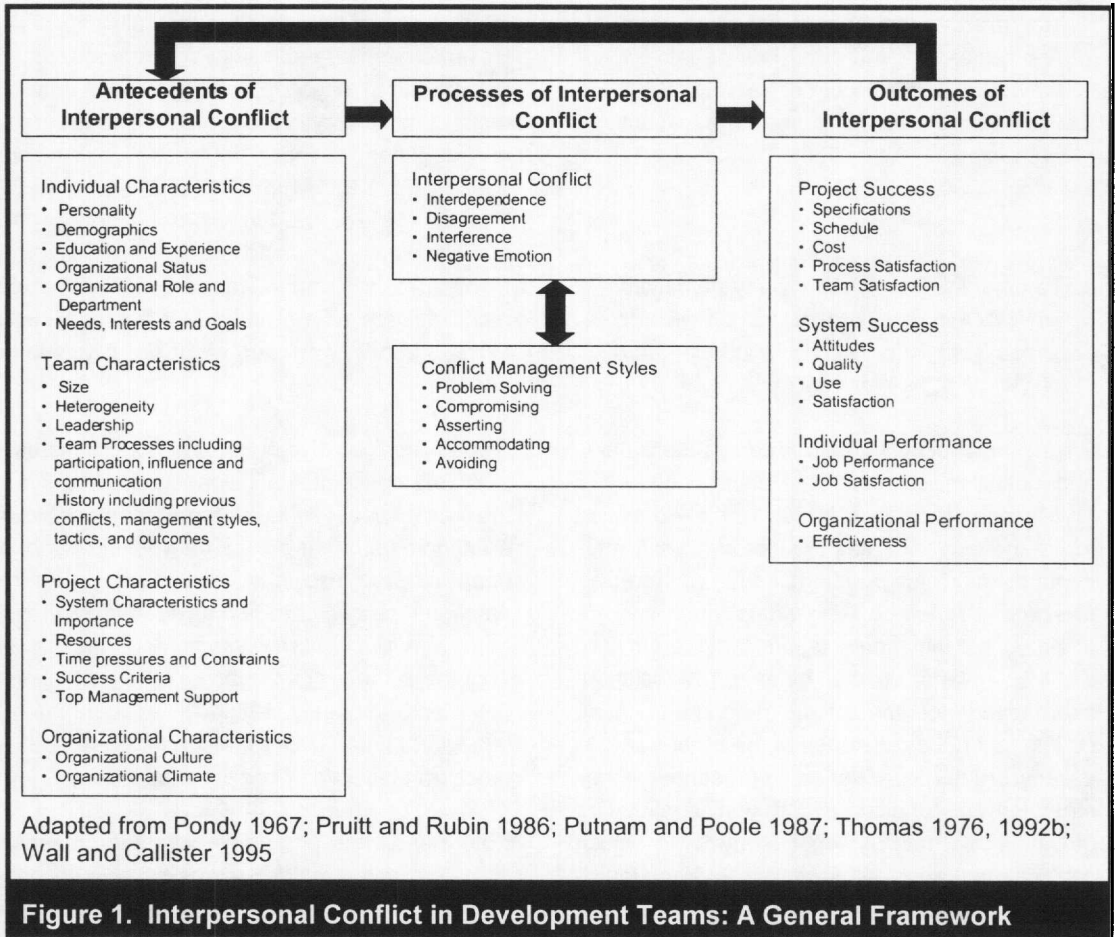
Definitions and Properties of Interpersonal Conflict ■■■■■

The term conflict has been employed in different ways reflecting the different levels at which various conflicts exist (Deutsch 1990; Thomas 1992a). Thomas (1992a) noted two broad uses of the term. The first refers to incompatible response tendencies within an individual, e.g., behavioral conflicts where one must choose whether or not to pursue a particular course of action, or role conflict where one must choose between several competing sets of role demands. The second use refers to conflicts that occur between different individuals, groups, organizations, or other social units; hence, the terms interpersonal, inter-group, inter-organizational, and international conflict.

Here, we focus on this second use, and in particular, on interpersonal conflict which has been defined in many different ways (Thomas 1992a; Wall and Callister 1995). Some examples include:

> content-oriented differences of opinion that occur in interdependent relationships and can develop into incompatible goals and interests (Putnam and Wilson 1982, p. 633);

> an expressed struggle between at least two interdependent parties who perceive incompatible goals, scarce rewards, and interference from the other party in achieving their goals (Hocker and Wilmot 1985, p. 23);

the process that begins when one party perceives that the other has negatively affected, or is about to negatively affect, something that he or she cares about (Thomas 1992a, p. 653);

and

a process in which one party perceives that its interests are being opposed or negatively affected by another party (Wall and Callister 1995, p. 517).

In a synthesis of the numerous conceptualizations and definitions of conflict, Putnam and Poole (1987) and Thomas (1992a, 1992b) identified three general themes or properties: inter-dependence, disagreement, and interference. **Interdependence** exists when each party's attainment of their goals depends, at least in part, on the actions of the other party. Without interdependence, the actions of each party have no impact on the outcomes of the other party. In essence, interdependence represents a key structural pre-condition of any conflict situation, providing an interpersonal context in which conflicts may arise. However, while many indivi-duals or groups are in interdependent relation-ships with others, not all will experience conflict. Thus, interdependence is a necessary, but not sufficient, condition for conflicts to occur. **Disagreement** exists when parties think that a divergence of values, needs, interests, opinions, goals, or objectives exists. As such, disagreement represents the key cognitive component of inter-personal conflict. Again, however, disagreement is not, by itself, sufficient for conflict to emerge. Disagreeing parties will not experience conflict when, for example, the areas of disagreement are irrelevant or unimportant (e.g., when there is no interdependence, or when the areas of disagree-ment are minor). **Interference** exists when one or more of the parties interferes with or opposes the other party's attainment of its interests, objectives, or goals. Interference thus represents the central behavioral characteristic of any conflict. Indeed, many researchers believe that the core process of interpersonal conflict is the behavior where one or more disputants oppose their counterpart's

interests or goals (Wall and Callister 1995). Researchers have also shown the importance of incorporating negative emotion into concep-tualizations of conflict, reflecting such feelings as jealousy, anger, anxiety, or frustration (Amason 1996; Jehn 1995; Pinkley 1990; Pondy 1967; Thomas 1992a, 1992b). These emotions are thought to emerge when there are major disagree-ments, or when parties interfere with the attain-ment of each others' important goals. Thus, a fourth property, **negative emotion**, can also be added.

A good definition of interpersonal conflict needs to incorporate all of its definitional properties. Thus, the present paper defines interpersonal conflict as *a phenomenon that occurs between interdepen-dent parties as they experience negative emotional reactions to perceived disagreements and interference with the attainment of their goals.* Together, these perceptions span situational (interdependence), cognitive (disagreement), behavioral (interference), and affective (negative emotion) elements of conflict situations.

Note that all four properties are often present in ISD. Typically, project teams involve multiple parties who are interdependent: users depend on the IS staff or analysts who develop the system, the IS staff depend on the users who evaluate the system developed, and both parties depend on top management for providing the necessary resources for the project (Robey et al. 1989). Also, parties involved in ISD often have divergent opinions, interests, or goals (DeBrabander and Thiers 1984; Robey et al. 1989; Smith and McKeen 1992). Further, when parties involved in ISD disagree and act solely with their own interests in mind, their actions are likely to interfere with other parties' interests or goals (Robey et al. 1989) in the form of foot dragging (Newman and Sabherwal 1989), political maneuvering (Markus 1983), steam rolling (Hirschheim and Newman 1991), or a proliferation of technical rules, norms, and regulations (Franz and Robey 1984). Finally, largely as a result of such actions, frustration, hostility, anger, and distrust can emerge (Glasser 1981; Smith and McKeen 1992).

The Assessment of Interpersonal Conflict ▄▄▄▄▄

Past research assessing interpersonal conflict can be classified into two groups. One group assessed styles of conflict management (e.g., Blake and Mouton 1964; Kilmann and Thomas 1977; Putnam and Wilson 1982; Rahim 1983). However, note that while potentially related, conflict management *style* is conceptually distinct from *level* of interpersonal conflict. The second group of studies directly assessed level of interpersonal conflict (e.g., Amason 1996; Barki and Hartwick 1994b; Brown and Day 1981; Etgar 1979; Habib 1987; Jehn 1995; Robey et al. 1989). At least two shortcomings of these latter studies can be identified. Many assessed interpersonal conflict with a small number of items, typically using items that looked only at perceptions of overall conflict (e.g., Barki and Hartwick 1994b; Robey et al. 1989). Such assessments are useful but do not provide an in-depth look at the underpinnings of the construct. On the other hand, studies assessing conflict in greater depth have not captured all of its definitional properties. While some assessed both *disagreement* and *negative emotion* (e.g., Amason 1996; Jehn 1995), most assessed only *disagreement* (e.g., Brown and Day 1981; Habib 1987), and few have assessed *interference* (for an exception, see Etgar 1979). Given the central role conflict researchers ascribe to interference (Wall and Callister 1995), neglecting its assessment from assessments of interpersonal conflict seems to be a serious omission.

The present study views interdependence, disagreement, interference, and negative emotion as dimensional indicators of interpersonal conflict. This treatment suggests that, when asked to assess the level of interpersonal conflict present in a situation (e.g., the level of interpersonal conflict that occurred over the course of an ISD project), one forms an appraisal by reflecting on his or her perceptions of levels of interdependence, disagreement, interference, and negative emotion. Thus, a good assessment of interpersonal conflict should result from the measurement of these four properties. Note that such a view neither denies nor is contradictory

with the presence of an underlying process where each dimension may have been an antecedent or consequence of the other dimensions. It simply posits that, whatever the underlying causal process, an individual's perceived level of conflict will be reflected by his or her perceptions of these four dimensions. Consistent with this view, interpersonal conflict is modeled as a multidimensional second-order latent construct reflected by interdependence, disagreement, interference, and negative emotion. In turn, each dimension is conceptualized as a first-order latent construct reflected by its observable indicators. Figure 2 shows this theoretical structure.

The first objective of the present study was to determine how well the model presented in Figure 2 captures individuals' perceptions of interpersonal conflict in ISD. Empirical verification of this model will clarify our fundamental understanding of the interpersonal conflict construct, providing an important theoretical contribution, both to the general conflict literature and to ISD. To attain this objective, three specific questions were addressed:

(1) Can a reliable assessment of interpersonal conflict be made? Similarly, can reliable assessments of the four definitional properties of interdependence, disagreement, interference, and negative emotion be made?

(2) Does the conceptual structure depicted in Figure 2 capture individuals' perceptions of interpersonal conflict in ISD? That is, how well does a model representing interpersonal conflict as a second-order multidimensional latent construct reflected by four first-order constructs fit the data?

(3) Does a measure of interpersonal conflict based on the four definitional properties relate to individuals' global assessments of interpersonal conflict? That is, does it significantly relate to a criterion measure (labeled interpersonal conflict criterion) assessing overall perceptions of the amount, frequency, or intensity of conflict?

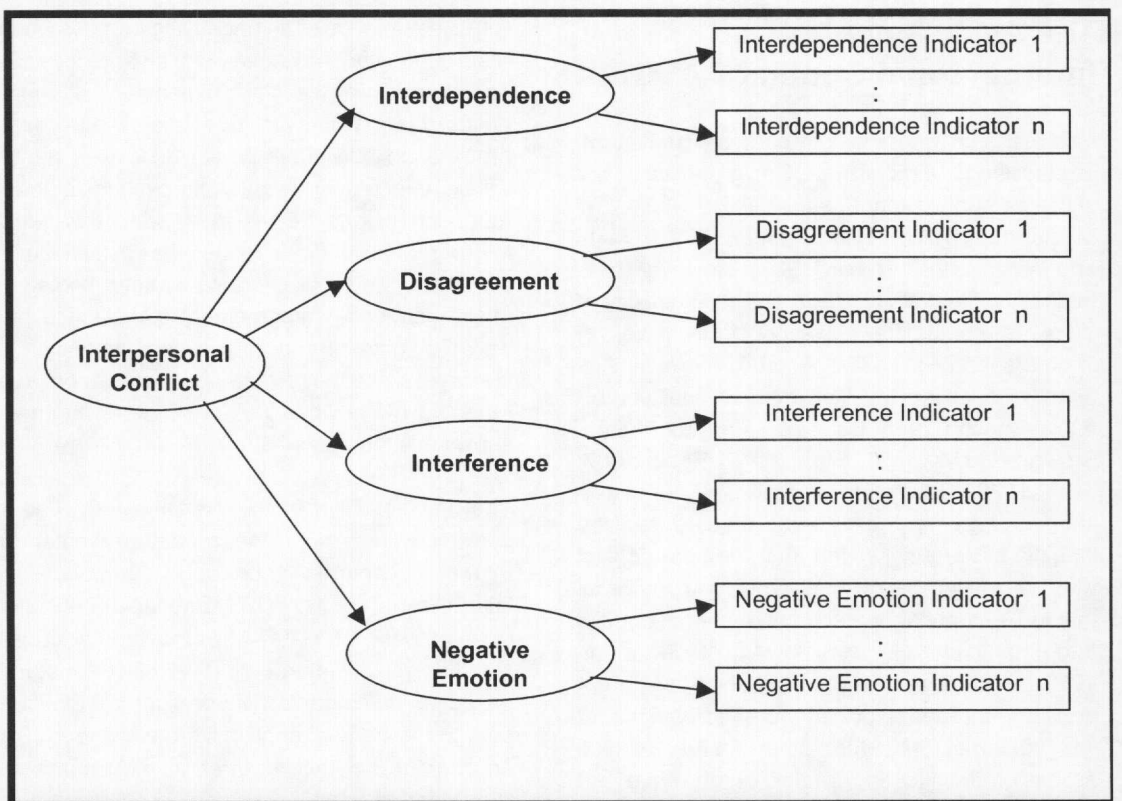Two specific hypotheses are proposed:

Figure 2. A Second-Order Multi-Dimensional Model of Interpersonal Conflict

H1: Interpersonal conflict in ISD is a second-order multidimensional latent construct reflected by the definitional properties of interdependence, disagreement, interference, and negative emotion.

H2: Interpersonal conflict in ISD will be highly correlated with the interpersonal conflict criterion, a latent construct assessing the overall amount, frequency, and intensity of perceived interpersonal conflict.

Interpersonal Conflict, Conflict Management Styles and ISD Outcomes ▮▬▬▬▬

The second and third objectives of the present study were to examine the relationship between interpersonal conflict and conflict management styles, as well as the effect of interpersonal conflict and conflict management styles on ISD outcomes. The conceptual model depicting these relationships is shown in Figure 3.

Interpersonal Conflict and Conflict Management Styles

Within the conflict domain, considerable effort has been expended to examine the management and resolution of conflicts, identifying a number of conflict management styles and their role in achieving satisfactory outcomes (cf., Blake and Mouton 1964; Pruitt and Rubin 1986; Putnam and Poole 1987; Thomas 1976, 1992b; Wall and Callister 1995). Several measures assessing styles of conflict management have also been developed (e.g., Kilmann and Thomas 1977;
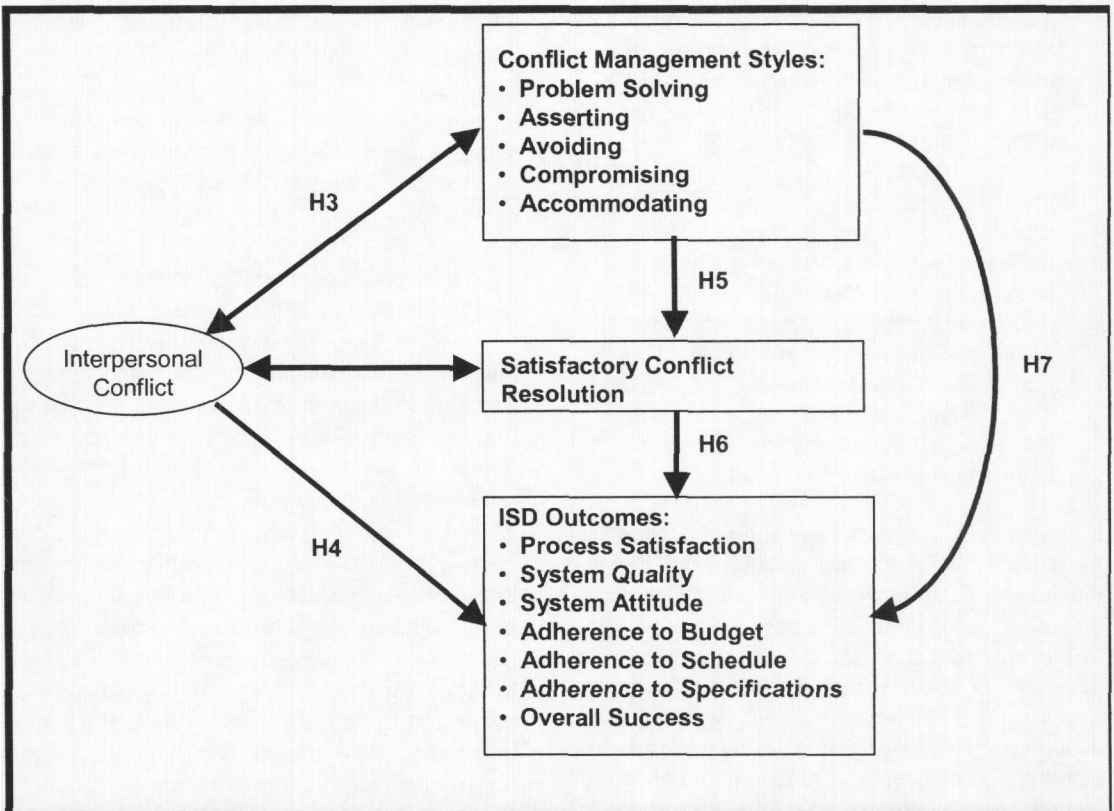
Figure 3. Interpersonal Conflict, Conflict Management Styles, Satisfactory Conflict Resolution, and Project Outcomes

Putnam and Wilson 1982; Rahim 1983). Traditionally, researchers have identified five different modes or styles of behavior, often labeled as: asserting, accommodating, compromising, problem-solving, and avoiding.[2] These styles are seen as general strategies or behavioral orientations individuals adopt when dealing with conflicts.

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[2]It should be noted that the factorial structure and number of styles individuals use in conflict situations have been questioned (e.g., Putnam and Wilson 1982). Past research has also pointed to the existence of other modes or styles of conflict management (e.g., Knapp et al. 1988). As the present study's objective was not to provide a resolution to the styles literature, but to obtain empirical evidence concerning the relationship between perceptions of conflict and styles of conflict management, the five traditionally identified styles were examined.

Asserting occurs as individuals strive to win or prevail. Conflict is seen as a fixed pie, zero sum situation, with one party's gains coming at the expense of the others' (in the case of goal conflicts), or with one party's accuracy or correctness occurring as others are found to be inaccurate or incorrect (in the case of judgment or decision conflicts). Conflict, therefore, is considered a win-lose situation. Alternative labels for this style include competing, dominating, and forcing. Assertive conflict handling behaviors have been observed in both IS staff and users. Examples include the user-led system design study of Franz and Robey (1984) and the user-dominated process described by Newman and Sabherwal (1989) and IS staff statements such as:

> System engineer: When somebody's not doing something, we roll in there and start doing it and get it structured just the way we want it. Then they get mad and

say "Its our job," but by then its all struc-tured and we back out and throw our resources somewhere else, and get something else going just the way we want it. (Curtis et al. 1988, p. 1274).

Project leader: …one of the people there said "We don't really want it. We've talked it over and we don't really want this new system….We resist the change." And basically the computer center says "Well, look, you have no choice….The old system will be turned off, and Thruway will be here to stay and you're not going to have that choice" (Hirsch-heim and Newman 1991, p. 44).

Like asserting, *accommodating* also views conflict as a fixed pie, zero sum situation and occurs when individuals sacrifice their own needs and desires in order to satisfy those of other parties. This occurs as individuals oblige or yield to others' positions, or cooperate in an attempt to smooth over conflicts. Alternative labels for this style include cooperating, obliging, yielding, and sacri-ficing. Examples of accommodating behaviors include cases where IS staff exercised their power in ways that left users little choice but to yield to or accommodate IS staff's goals and desires (Markus 1983) and quotes such as:

Systems coordinator: So questions on screen design were resolved by the users getting their way….There was an issue on how many data entry screens were too many. And they *won the battle*. We simply redesigned the data entry screens (Hirschheim and Newman 1991, p. 49).

How can I be against the computer sys-tem? It's progress isn't it? (Bjørn-Andersen et al. 1979).

Compromising is a third style that views conflict as a fixed pie, zero sum situation. However, com-promising frequently splits the difference or involves give and take behaviors where each party wins some and loses some. Alternative labels include sharing and splitting the difference. Com-promising frequently occurs between IS staff and users in ISD, and is found in both the cooperative and the conflict processes of Newman and

Sabherwal. The following statement also illus-trates the compromise style at work:

System engineer: He lets me win some-times and I let him win sometimes, and the game goes on (Curtis et al. 1988, p. 1273).

Problem-solving occurs when individuals in con-flict try to fully satisfy the concerns of all parties. Here, conflict is not seen as a fixed pie, zero sum situation, as was the case for the first three styles. Instead, actions are aimed at expanding the pie so that all parties can achieve their goals and objectives. Similarly, judgments and decisions are not seen as right or wrong. Instead, a synthesis is sought, integrating all parties' perspectives. Hence, the term win-win solution. Alternative labels of this style include integrating, cooperating and collaborating. In ISD, problem-solving behaviors have been labeled cooperation by New-man and Sabherwal, who characterize them as users and IS working together toward a system that meets larger organizational goals. They also note that such behaviors are more likely to occur in cases where users do not perceive the project as a threat. After observing the behaviors of exceptional designers, Curtis et al. state

[Exceptional designers'] understanding of both customers and developers allowed them to integrate different, sometimes competing, perspectives on the develop-ment process (p. 1271).

Similarly, the quote,

System engineer: You've got to figure out a way that everybody wins (Curtis et al. 1988, p. 1277)

is another example of this style.

Finally, *avoiding* occurs when individuals are indifferent to the concerns of either party and refuse to act or participate in conflict. Here, one withdraws, physically or psychologically, abdi-cating all responsibility for the solution. Alterna-tive labels for this style include withdrawing, evading, escaping, and apathy. Examples of avoidance in ISD include introverted team mem-bers who were observed to

...either withdraw into a shell or resist through passive/aggressive subversion ...they won't tell you what's going on (Garner 1994, p. 88)

and

Underwriter: And you became good at circumventing [the system]. Because it becomes a political ball game. You can't undermine what the computer department is trying to do...you've got to survive. And you can't really be subversive to their efforts, because it comes back to haunt you anyway, but you have to do what you have to do to get your work out. You can't complain. Its one of those things you do quietly (Hirschheim and Newman 1991, p. 48).

Our second objective was to study the relationship between interpersonal conflict and conflict management styles. While past research provides little empirical evidence concerning this relationship, an implicit assumption of the normative literature is that the problem-solving style *leads to* integrative, win-win solutions, thereby reducing the level of conflict present. In contrast, the asserting style is thought to potentially lead to deadlocks or one-way solutions. While such results may satisfy one party in the short run, they can also lead to an escalation of conflict, or to the emergence of new and different conflicts later on. As the avoiding style also leaves conflicts unresolved, it too can anger or frustrate parties, resulting in the continuation or an escalation of the conflict. Thus, problem-solving can be seen as resulting in less, whereas asserting and avoiding can be thought of as leading to greater levels of interpersonal conflict. Alternatively, the level of interpersonal conflict can be thought to *result in* individuals' selection of certain conflict management styles. For example, high levels of conflict may make individuals hesitant to use the problem-solving style, which involves a detailed, open and candid exchange of information by the parties. Instead, intensive conflicts may induce individuals to adopt an avoiding style (e.g., as a means of escape from the situation), or an asserting style (e.g., to selfishly satisfy one's own concerns, or perhaps to signal an image of strength). As such, high levels of conflict can be thought to lead to the use of higher levels of asserting and avoiding, but lower levels of problem-solving.

Thus, conflict management styles may be viewed either as antecedents or consequences of interpersonal conflict. This relationship is shown in Figures 1 and 3 with a bi-directional arrow between interpersonal conflict and conflict management styles. However, as discussed above, the predicted correlations between the two are the same, regardless of whether styles are seen as antecedents or consequences of conflict. Consequently, interpersonal conflict is hypothesized to have a negative correlation with problem-solving, and positive correlations with asserting and avoiding.[3] No *a priori* hypotheses are made for accommodating and compromising since findings of past research concerning these two styles are less clear.

H3: Interpersonal conflict in ISD will have a negative correlation with problem-solving and positive correlations with asserting and avoiding.

These correlations are expected to be significant but low to moderate in magnitude, indicating conflict management style and interpersonal conflict are distinct constructs. Support for H3 will provide empirical evidence for the relationship between interpersonal conflict and conflict management styles, as well as evidence of predictive and nomological validity for the measure and construct of interpersonal conflict conceptualized here.

Interpersonal Conflict, Conflict Management Styles, and ISD Outcomes

Our third objective was to examine the effects of interpersonal conflict and conflict management styles on ISD outcomes. The conflict literature has identified both negative and positive outcomes of interpersonal conflict. Examples of negative outcomes include distrust of others, hostility,

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[3]These relationships are between interpersonal conflict and the parties' general use of different conflict management styles. Relationships between interpersonal conflict and the parties' specific use of different styles (i.e., the use of different styles for different issues, with different hierarchical relationships, or at different times in a temporal sequence of events) may vary (Knapp et al. 1988; Wall and Callister 1995).

decreased group coordination and cohesiveness, reduced job satisfaction and motivation, higher absenteeism and turnover, grievances, and lower performance and productivity (e.g., Pruitt and Rubin 1986; Putnam and Poole 1987; Thomas 1976, 1992b; Wall and Callister 1995). Examples of positive outcomes include greater self-awareness, creativity, adaptation, and learning (e.g., Cosier and Dalton 1990; Robbins 1978; Tjosvold 1991).

According to the normative conflict literature, it is the style of conflict management that determines whether conflict has positive or negative effects (e.g., Deutsch 1990; Pondy 1967). Essentially, this states that conflict's positive outcomes come from the use of appropriate conflict management styles, while negative outcomes result from inappropriate styles and suggests that interpersonal conflict has no direct relationship to ISD outcomes once the effect of conflict management styles is accounted for. On the other hand, Wall and Callister point out that, while both negative and positive outcomes have been identified in past conflict research, negative outcomes by far outnumber the positive ones. Based on Wall and Callister, and the results of Robey et al. (1993) who observed a negative relationship between conflict and IS project success (i.e., the amount and quality of the work performed by the team, the efficiency of its operations, and the effectiveness of its interactions with people outside the team, as well as its adherence to project budget and schedule), we propose the following hypothesis:

H4: Interpersonal conflict will have a negative effect on ISD outcomes.

According to the normative conflict literature, problem-solving leads to positive outcomes, especially in the long term, while asserting and avoiding are generally eschewed (e.g., Blake and Mouton 1964). On the other hand, empirical studies examining the effects of using different styles are relatively few, and none exist in IS. In fact, the paucity of empirical evidence has led some researchers to ask:

> do the various conflict-management suggestions, proffered to the disputants,

actually work? Admittedly, they have a logical appeal, but do they work? (Wall and Callister 1995, p. 545).

This suggests the need to investigate the relationship between conflict management styles and ISD outcomes. Satisfactory conflict resolution, an important outcome of the interpersonal conflict process in past IS research on conflict (Barki and Hartwick 1994b; Robey et al. 1989), may partly or completely mediate the effect of conflict management style on other ISD outcomes such as system quality, adherence to project budget and schedule, or overall project success. Specifically, the effectiveness of various conflict management styles may be captured by their ability to satisfactorily resolve interpersonal conflict. This satisfactory resolution of conflict in turn positively influences other ISD outcomes. It is important to note that, as an intervening variable, satisfactory conflict resolution not only captures the effect of the five conflict management styles investigated in the present study, it also captures the impact of other conflict management strategies that were not assessed. As such, satisfactory conflict resolution can represent the global impact of a variety of conflict management styles and strategies, providing a gauge to the impact of conflict management activities in general. To investigate the direct and mediated effects of conflict management styles on ISD outcomes, as well as the effect of satisfactory conflict resolution on these outcomes, the following hypotheses, depicted in Figure 3, are proposed:

H5: Problem-solving will have a positive effect, while asserting and avoiding will have a negative effect on satisfactory conflict resolution in ISD.

H6: Satisfactory conflict resolution will have a positive effect on ISD outcomes.

H7: Problem-solving will have a positive effect, while asserting and avoiding will have a negative effect on ISD outcomes.

Finally, while not central to the hypotheses of the present study, Figure 3 depicts a relationship between interpersonal conflict and satisfactory conflict resolution. This relationship was hypo-

thesized but not supported by Barki and Hartwick (1994b). A significant negative relationship between these variables was observed by Robey et al. (1989).

Method ▬▬▬▬▬▬▬▬▬▬

Sample of Respondents

A total of 653 IS directors were randomly selected from a listing of the largest 2,000 Canadian organizations and contacted to inquire about whether or not their organization had developed and implemented an IS application within the last six months. A total of 141 IS directors responded affirmatively and agreed to participate in the study. Each project leader was then contacted to obtain their cooperation, the names of all users of the systems developed, and the names of the IS staff who worked on the project. All IS staff and users were called and asked the names of all participants in the project and whether they were willing to participate in the study. In all, 343 of 346 IS staff and 450 of 456 users contacted agreed and were mailed the IS staff and user questionnaires, respectively. A follow-up letter was sent to non-respondents one month after the mailing of the questionnaires. Useable responses were received for 162 ISD projects from 265 IS staff (77.3% of the questionnaires mailed) and 272 users (60.4% of questionnaires mailed).

IS staff in the sample were 31% female. The average age was 37, and ranged from 22 to 60 years; 1% had elementary school education, 8% had completed high school, 77% had a community college or bachelor's degree, 10% had a post-graduate certificate or diploma, and 4% had a master's or Ph.D. degree; 96% were members of the project team, with 46% stating that they had been the team leader. Users in the sample were 40% female. The average age was 39, and ranged from 22 to 61 years; 2% had an elementary school education, 24% had completed high school, 46% had a community college or bachelor's degree, 23% had a post-graduate certificate or diploma, and 6% had a master's or Ph.D. degree; 80% were members of the project

team, with 21% stating that they had been the team leader. The systems in the sample covered many different application areas, the most frequent ones being finance, marketing/sales, and administration. They also covered a wide variety of economic sectors with military, education, transportation, insurance, government, health, and finance being the most frequently reported.

Questionnaire Items

Interpersonal Conflict

Interpersonal conflict was defined as a phenomenon that occurs between interdependent parties when they experience negative emotional reactions to perceived disagreements and interference concerning the parties' goals. Given the lack of reliable and validated measures of interpersonal conflict, items were developed to assess each of the four definitional properties: interdependence, disagreement, interference, and negative emotion. An important objective was to develop a small set of items that would provide a broad and comprehensive coverage of the important aspects of the whole ISD process and also be generalizable to ISD projects. To ensure breadth, both process and product aspects of ISD were taken into account (Kappelman and McLean 1994; Nidumolu 1995). Items assessing perceptions of how an ISD project is managed and implemented (e.g., staffing the project team, calling and running meetings, reporting to top management) cover a project's process aspects. Items assessing perceptions of system goals, physical design, and implementation cover the product aspects of a project. Further, these items also span typical project stages, ensuring generalizability and breadth. Finally, because interpersonal conflict in ISD usually involves IS staff and user interactions, items capturing perceptions of both parties' thoughts, feelings and behaviors are needed.

The four definitional properties of interpersonal conflict were operationalized with 20 items. Four items, numbered from 1 to 4 in the Appendix, assessed interdependence. Interdependence reflects the extent to which different parties depend on each other to accomplish their tasks.

The interdependence items assessed the extent to which the project entailed joint collaboration between the IS staff and users, as well as their dependence on each other to accomplish their work. Four items, numbered from 5 to 8 in the Appendix, assessed disagreement. Disagreement reflects the divergent values, needs, or objectives of the parties involved. The disagreement items assessed the extent to which IS staff and users disagreed about how the project was managed, the system's goals, physical design, and implementation. Eight items, numbered from 9 to 16 in the Appendix, assessed interference. Interference exists when one party opposes or prevents the other from achieving its goals. As with disagreement, the interference items assessed the extent to which IS staff and users interfered with how the project was managed, the system's goals, physical design, and implementation. As such, interference and disagreement items have a similar structure. On the other hand, because either party can interfere with the other, each party's interference was included, resulting in eight interference items. Finally, four items, numbered from 17 to 20 in the Appendix, were used to assess negative emotion. Negative emotion reflects an individual's feelings such as anger and frustration that are likely to result from disagreements with, and interference from, the other party. Because such feelings are generally of a global nature, individuals can not easily associate them with specific issues as in the case of disagreement and interference, which are more cognitive. Consequently, the negative emotion items were worded to capture feelings of anger and frustration resulting in oneself from the actions of the other party, and perceptions of similar feelings in the other party resulting from one's own actions. All items were assessed on 11-point scales, ranging from 0 (not at all) to 10 (a lot).

Interpersonal Conflict Criterion

To assess criterion validity, three items numbered 21 to 23 in the Appendix, were included to assess the extent of overall interpersonal conflict perceived by the respondents. Using 11-point scales, these items asked how much conflict there was (from none to a lot), how often conflicts occurred (from none to a lot), how often conflicts occurred (from not intense to intense).

(from never to frequently) and how intense the conflicts were (from not intense to intense).

Conflict Management Styles

Twenty items, adapted from previous measures (Kilmann and Thomas 1977; Rahim 1983), were used to assess the extent to which IS staff and users employed five styles (problem-solving, asserting, avoiding, compromising, and accommodating). For each style, two items inquired respondent's own behaviors, and two items asked about the behaviors of the other party(ies). Conceptually, these indices measure the overall usage of each style by everyone involved in the project, and not only the respondent's own usage of the style. As such, relationships between interpersonal conflict (reflecting the interdependence, disagreement, interference, and negative emotions of all participants in the project) and conflict management styles (again reflecting the behavioral styles of all project participants) can be investigated. The style items (24 to 43 in the Appendix) assessed these behaviors on 11-point scales ranging from 0 (never) to 10 (always). The internal consistency reliabilities of the five styles were (user and IS staff, respectively): problem-solving (.87 and .85), asserting (.64 and .67), avoiding (.79 and .83), compromising (.84 and .81), and accommodating (.75 and .66).

Satisfactory Conflict Resolution

This variable was assessed with four items adapted from Robey et al. (1989) and Barki and Hartwick (1994b). These items asked respondents to indicate, on 11-point scales ranging from 0 (not at all) to 10 (completely), the extent to which conflicts were resolved. Scores for this variable were created by averaging responses to the four items (Cronbach alphas = .94 and .91, user and IS staff samples, respectively).

ISD Outcomes

Seven ISD outcomes were assessed: process satisfaction, system quality, system attitude, adherence to project budget, adherence to project schedule, adherence to project specifications, and overall project success (the items used to measure each variable are listed in the Appendix).

Process satisfaction was assessed with six items developed for the study and asked respondents to indicate, on 11-point scales ranging from -5 (dissatisfied) to +5 (satisfied), the extent to which they felt satisfied with the project team and the system development process. Scores were calculated by averaging responses to the six items (Cronbach alphas = .90 and .82, user and IS staff samples, respectively).

System quality was assessed with 14 items adapted from Rivard et al. (1997). The items asked respondents to indicate, on 11-point scales ranging from 0 (not at all) to 10 (definitely), the extent to which they believed the system was reliable, adaptable, easy to understand and use, and provided precise, complete, and useful output. Scores were calculated by averaging responses to the 14 items (Cronbach alphas = .91 and .93, user and IS staff samples, respectively).

System attitude was assessed with four items, adapted from Barki and Hartwick (1994a). These asked respondents to indicate their personal feelings regarding the system on 11-point bi-polar affective scales (i.e., bad/good). Scores were calculated by averaging responses to the four items (Cronbach alpha = .89 for the user sample; system attitude was not measured for the IS staff sample).

Four single, 5-point scales were used to assess adherence to project budget, adherence to project schedule, adherence to project specifications, and overall project success. Adherence to project budget was scored from +2 (way under budget) through 0 (on budget) to -2 (way over budget). Adherence to project schedule was scored from +2 (much earlier than scheduled) through 0 (on time) to -2 (much later than scheduled). Adherence to project specifications was scored 0 (meeting the original specifications), -1 (smaller/larger than promised), and -2 (much smaller/much larger than promised). Finally, overall project success was scored from +2 (successful) through 0 (neither successful nor unsuccessful) to -2 (unsuccessful).

Analytical Procedures

Stage One: The Assessment of Interpersonal Conflict

Structural equation modeling (SEM) was used to examine the construct of interpersonal conflict and its hypothesized dimensional indicators: interdependence, disagreement, interference, and negative emotion. This analysis served to assess the factorial structure of interpersonal conflict, as well as the reliability, convergent validity, discriminant validity, and criterion validity of the construct and its dimensions. Also, the generalizability of the findings was assessed with a multi-sample analysis of the user and IS staff samples. Thus, stage one focused on testing H1 and H2.

First, a confirmatory factor analysis (CFA) was performed where all four hypothesized dimensions and the interpersonal conflict criterion were correlated with each other (see Figure 4). This is generally recommended as a first step in SEM to assess how well proposed constructs have been measured (e.g., Anderson and Gerbing 1987). The CFA enables the internal consistency reliability of each construct to be assessed, and examining the correlation between constructs permits an evaluation of convergent, discriminant, and criterion validities. Specifically, good model fit and significant correlations between the four dimensional constructs provide evidence of convergent validity. Further, correlations between constructs that are significantly less than 1.0 provide evidence of their discriminant validity (Bagozzi and Phillips 1982).

Next, two competing structural representations of interpersonal conflict were evaluated to examine the construct's dimensionality. The first, a second-order multidimensional model (Figure 2), suggests interpersonal conflict is a global construct reflected by distinct dimensional indicators. The second views interpersonal conflict as a uni-dimensional construct reflected by indicators that do not differentiate any underlying dimensions. Comparing these nested models provides a test of H1. In addition, significant correlations between interpersonal conflict and the criterion measure provides evidence of criterion validity (H2).

4A. IS Staff

Fit Statistics:
ChiSquare: 172.97, df = 94, p < .001
CFI: .94
AASR .032
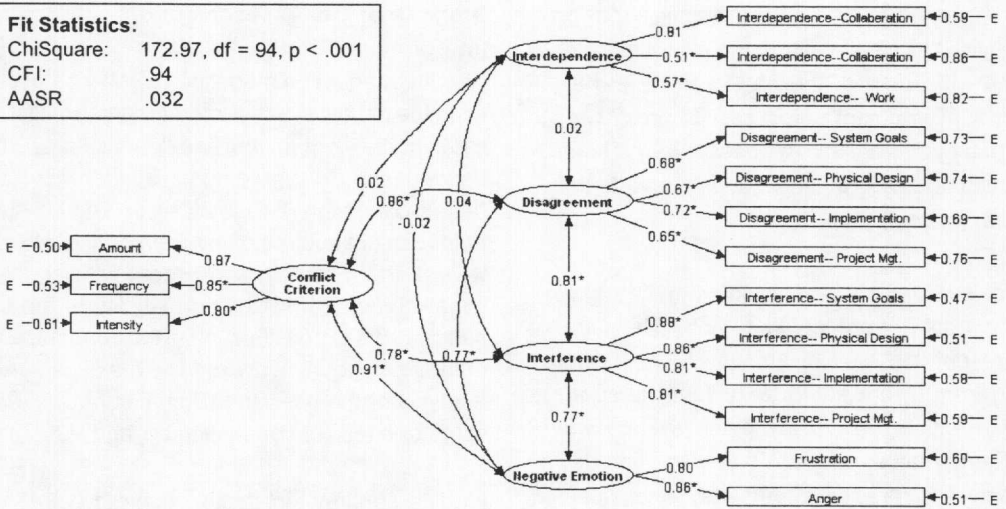
4B. Users

Fit Statistics:
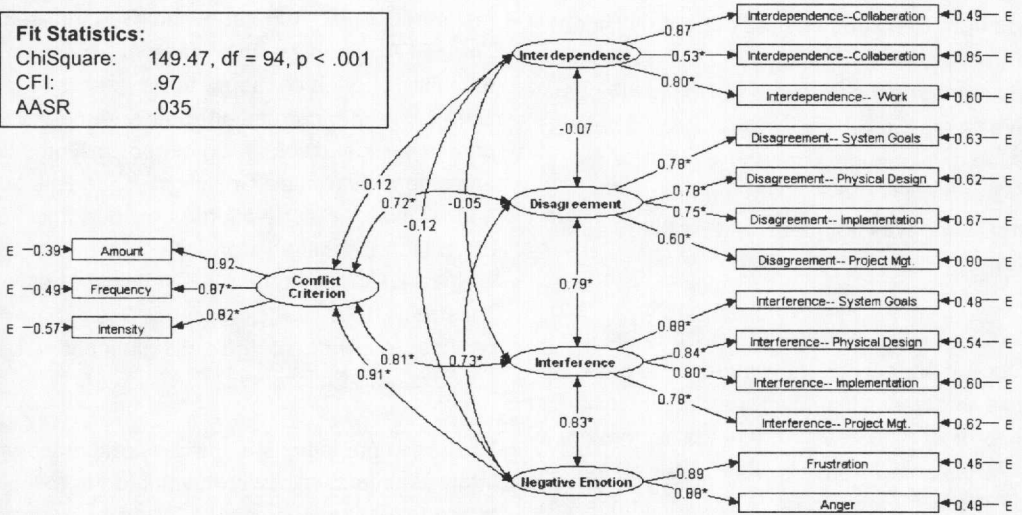ChiSquare: 149.47, df = 94, p < .001
CFI: .97
AASR .035

Figure 4. Model Parameters for the Measurement Model of Interpersonal Conflict

The final set of stage one analyses examined the generalizability of the results obtained above. Recent discussions of SEM methods have raised concerns about the "post-hoc fitting of mis-specified models, with little or no regard for capitalization on chance factors or for generalizability to the population" (Byrne 1994, p. 214). To address these concerns, Byrne recommended the cross-validation of structural equation models, a recommendation rarely followed (MacCallum et al. 1992). In this study, the presence of two samples of respondents enables a cross-validation of best-fitting structural models. This was done by examining two nested models (one without and one with cross-group equality constraints) in a multi-sample SEM analysis testing whether or not model paths are equivalent in the user and IS staff samples.

A partially disaggregated conceptual model (Bagozzi and Edwards 1998; Bagozzi and Heatherton 1994) underlies all SEM analyses of this paper. With such a model, items are initially aggregated (through summation or averaging) to create item packets or composites which are then used as indicators of model constructs. As argued by Bagozzi and his colleagues, and empirically shown by Landis et al. (2000), using composites reduces random error, enables more stable and reliable estimates of model constructs, and improves model fit. There are two possible downsides to this approach. First, invalid composite indicators could be formed through the inclusion of items that load on other factors. To eliminate this possibility, Bagozzi and Edwards recommend that a preliminary factor analysis be conducted. This was done and all items were found to load on their hypothesized dimensions. A second possible downside stems from the more "molecular" construct representation of the partial disaggregation approach. It does not provide the specific psychometric information concerning each individual item that would be obtained with the more "atomistic" representation of the total disaggregation approach. However, the partial disaggregation approach employed here is deemed highly appropriate when the focus of the research is on general concepts and not on specific item content (Bagozzi and Edwards 1998; Bagozzi and Heatherton 1994; Hall et al. 1999; Landis et al. 2000).

Also, composites can be homogeneous or heterogeneous (Landis et al. 2000). With homogeneous composites, the potential multi-faceted nature of a construct is represented by indicators, each representing one facet. As such, the breadth of the construct is captured by the different indicators. Alternatively, with heterogeneous composites, the potential multi-faceted nature of a construct is represented by indicators, each representing all facets of the construct. As such, each indicator captures the breadth of the construct. Hall et al. have argued for the use of heterogeneous composites, whereas Landis et al. showed that both approaches improve model fit through better measurement of model constructs. The present study created composites by averaging interdependence items 3 and 4 (labeled Interdependence–Work), interference items 9 and 10, 11 and 12, 13 and 14, and 15 and 16 (labeled Interference–System Goals, Interference–Physical Design, Interference–Implementation, and Interference–Project Management, respectively), and negative emotion items 17 and 18, and 19 and 20 (labeled Frustration and Anger, respectively). Each composite is, therefore, homogeneous with respect to the target activity of its items, but heterogeneous with respect to the individual involved. As such, each composite matches the present study's conceptualization of interpersonal conflict, defined as a situational phenomenon reflected by interdependence, disagreement, interference, and negative emotions of all parties involved. Note that the remaining items (interdependence items 1 and 2, disagreement items 5 to 8, and the interpersonal conflict criterion items 21 to 23) were not combined into composites, since these reflect the activities of all involved parties. As a result, all indicators used in the SEM analyses matched the study's conceptualization of interpersonal conflict.[4]

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[4]In creating composites, items were weighted equally, similar to Bagozzi and Edwards (1998), Bagozzi and Heatherton (1994), and Landis et al. (2000). While the use of unequal weights would result in a less constrained model and improve model fit in the present study, this use capitalizes on sample-specific differences and random error that is unlikely to generalize to other samples. The present study's use of equal weights provides a more conservative model test and yields more generalizable results.

To conduct the SEM analyses, structural equation modeling using EQS for Windows 5.6 (Bentler and Wu 1995) was employed. Preliminary analyses indicated the data were multivariate non-normal (Mardia's normalized estimate was 35.62 for IS staff, 53.87 for users). In such cases, maximum likelihood estimates (which have been found to be robust to such violations) are recommended (Chou and Bentler 1995). Researchers also recommend the use of multiple indices for checking the overall goodness of fit of a structural equation model (Hu and Bentler 1995). The indices used to assess model fit (along with their recommended threshold values) were Robust Chi-square (Satorra-Bentler Scaled Chi-square) [non-significant], the Robust CFI [< .90], and the Average Absolute Standardized Residual (AASR) [< .05]. The use of robust fit statistics corrects for multivariate non-normality in the study data.

Stage Two: Interpersonal Conflict, Conflict Management Styles, and ISD Outcomes

SEM analyses were used to examine the relationships between interpersonal conflict, conflict management styles, satisfactory conflict resolution, and ISD outcomes depicted in Figure 3. Two such analyses were conducted, one for the IS staff sample and one for the user sample. In these analyses, interpersonal conflict was modeled as a second order multi-dimensional construct, as shown in Figure 5. Each of the five conflict management styles (problem-solving, asserting, avoiding, compromising, and accommodating) were included as measured variables and allowed to correlate with each other. Each style was also allowed to correlate with interpersonal conflict. Thus, the H3 path of Figure 3 actually represents five correlated model paths that were analyzed with SEM. Satisfactory conflict resolution was also included as a measured variable and allowed to correlate with interpersonal conflict. Each of the five conflict management styles were also causally linked to satisfactory conflict resolution. Thus, the H5 path of Figure 3 actually represents five causal paths examined in the SEM analysis. ISD outcomes were also modeled as measured variables (six for the IS staff sample and seven for the user sample) and allowed to correlate with each other. Interpersonal conflict, the five conflict management styles, and satisfactory conflict resolution

were causally linked to each outcome variable. Thus, the H4, H6, and H7 paths of Figure 3 each represent, 6, 6, and 30 causal paths in the SEM analysis of the IS staff sample. The corresponding number of paths for the user sample were 7, 7, and 35.
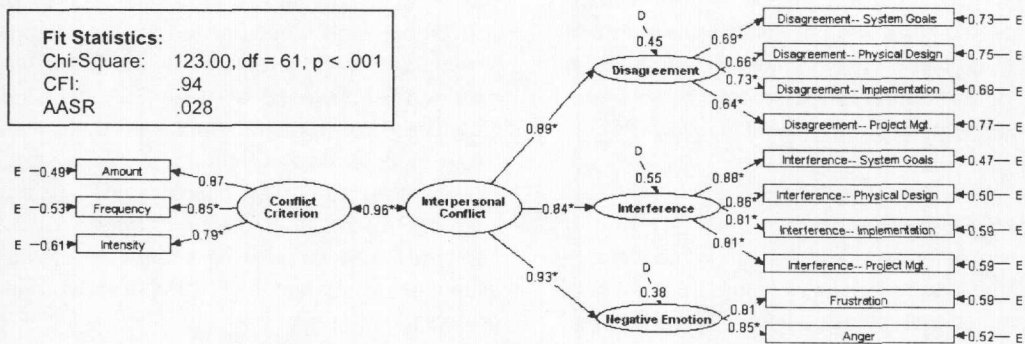
Results

Stage One: The Assessment of Interpersonal Conflict

CFA of the IS Staff Sample

The model of Figure 4 was examined using the IS staff data. The results of this analysis are reported in Figure 4a. As can be seen, a very good overall fit was achieved by the model. While the Chi-square test was significant (Robust Chi-square = 172.97, df = 94, $p < .001$), this is a frequent occurrence especially with large sample sizes (Jöreskog and Sörbom 1988). However, both the CFI and AASR indices exceeded their recommended threshold levels (Robust CFI = .94; and AASR = .032). Factor loadings for the five constructs (interdependence, disagreement, interference, negative emotion, and the interpersonal conflict criterion) were also good, ranging from .51 to .88, with an average loading of .76. The internal consistency reliabilities of the constructs were also quite good (interdependence = .67, disagreement = .78, interference = .91, negative emotion = .82, interpersonal conflict = .92, and the interpersonal conflict criterion = .88).

As described by Campbell and Fiske (1959), convergent validity assesses the extent to which different methods of measuring a construct are in agreement with one another. The CFA of the model shown in Figure 4 provides evidence of convergent validity for each of the four dimensions of interpersonal conflict and for the interpersonal conflict criterion. The relatively good factor loadings, in conjunction with the good overall fit of the model, suggests that convergent validity has been achieved in the sense that the indicators used to assess each dimension loaded significantly on their hypothesized factors (e.g., Bagozzi and Phillips 1982). Further, disagreement, inter-

5A. IS Staff

Fit Statistics:
Chi-Square: 123.00, df = 61, p < .001
CFI: .94
AASR   .028

E −0.49 — Amount
E −0.53 — Frequency
E −0.61 — Intensity

0.87 / 0.85* / 0.79* — Conflict Criterion

0.96* — Interpersonal Conflict

0.89* — Disagreement (D 0.45)
0.84* — Interference (D 0.55)
0.93* — Negative Emotion (D 0.38)

Disagreement:
0.69* — Disagreement-- System Goals — 0.73 — E
0.66* — Disagreement-- Physical Design — 0.75 — E
0.73* — Disagreement-- Implementation — 0.68 — E
0.64* — Disagreement-- Project Mgt. — 0.77 — E

Interference:
0.88* — Interference-- System Goals — 0.47 — E
0.86* — Interference-- Physical Design — 0.50 — E
0.81* — Interference-- Implementation — 0.59 — E
0.81* — Interference-- Project Mgt. — 0.59 — E

Negative Emotion:
0.81* — Frustration — 0.59 — E
0.95* — Anger — 0.52 — E

5B. Users

Fit Statistics:
Chi-Square: 110.00, df = 61, p < .001
CFI: .96
AASR   .041

E −0.39 — Amount
E −0.49 — Frequency
E −0.58 — Intensity

0.92 / 0.87* / 0.82* — Conflict Criterion

0.94* — Interpersonal Conflict

0.80* — Disagreement (D 0.60)
0.88* — Interference (D 0.47)
0.95* — Negative Emotion (D 0.30)

Disagreement:
0.77* — Disagreement-- System Goals — 0.63 — E
0.78* — Disagreement-- Physical Design — 0.62 — E
0.75* — Disagreement-- Implementation — 0.67 — E
0.60* — Disagreement-- Project Mgt. — 0.80 — E

Interference:
0.88* — Interference-- System Goals — 0.47 — E
0.84* — Interference-- Physical Design — 0.54 — E
0.80* — Interference-- Implementation — 0.60 — E
0.79* — Interference-- Project Mgt. — 0.62 — E

Negative Emotion:
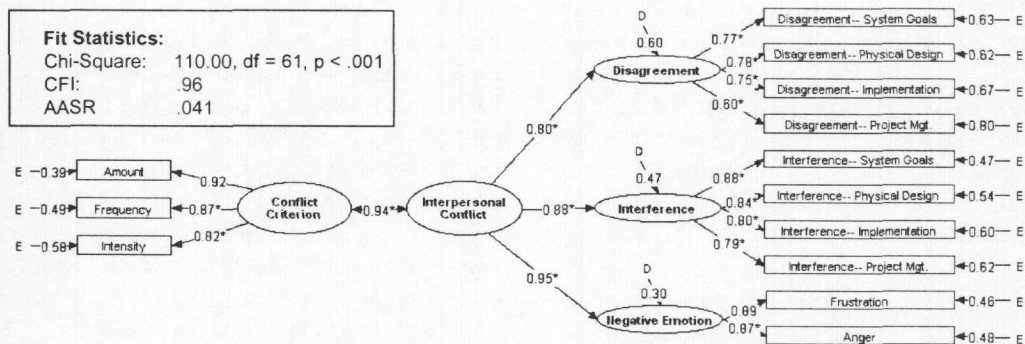0.89* — Frustration — 0.46 — E
0.87* — Anger — 0.48 — E

Figure 5. Model Parameters for the Second-Order Multi-Dimensional Model of Interpersonal Conflict

ference, and negative emotion all significantly correlated with one another, suggesting they each capture a significant portion of the common variance in interpersonal conflict. However, interdependence did not correlate significantly with any of the other dimensions, suggesting a lack of convergence with the other dimensions.

Campbell and Fiske describe discriminant validity as the extent to which measures of different constructs differ from one another. The correlations between interdependence and the other three dimensions were non-significant. While the correlations between disagreement, interference, and negative emotion were all high and significant, each was also significantly less than 1.0, providing evidence of discriminant validity. These are strong results when it is considered that the indicators of the latter three constructs were derived from the same questionnaire (which inflates common method variance), and also that the correlations were between latent constructs (therefore corrected for attenuation due to unreliability). Finally, as shown in Figure 4a, correlations between the interpersonal conflict criterion and the three dimensions of disagreement,

interference, and negative emotion were all high and significant, providing strong evidence of their criterion validity. On the other hand, the correlation between interpersonal conflict criterion and interdependence was non-significant, casting further doubt on the inclusion of interdependence in assessments of interpersonal conflict.

CFA of the User Sample

The model of Figure 4 was also analyzed with the user data. Results shown in Figure 4b indicate a very good overall fit was achieved. While the Chi-square was significant (Robust Chi-square = 149.47, df = 94, p < .001), both the CFI and AASR indices exceeded their threshold levels (Robust CFI = .97; AASR = .035). Factor loadings for interdependence, disagreement, interference, negative emotion, and the interpersonal conflict criterion were also good, ranging from .53 to .89 with an average loading of .80. Internal consistency reliabilities of the constructs were also good (interdependence = .79, disagreement = .82, (interference = .90, negative emotion = .88, interpersonal conflict = .91, and the interpersonal conflict criterion = .91).

The user sample CFA shown in Figure 4b also provides evidence of convergent validity for each of the four dimensions of interpersonal conflict and the interpersonal conflict criterion. As with IS staff, the good overall fit of the model, along with the relatively good factor loadings for the indicators, again suggesting that convergent validity was achieved for each dimension. Further, disagreement, interference, and negative emotion all significantly correlated with one another, suggesting they each capture a significant portion of the variance in interpersonal conflict. However, interdependence did not correlate significantly with any of the other dimensions, once again suggesting its lack of convergence with the other dimensions. As can be seen in Figure 4b, the correlations between all constructs were very similar to those obtained with the IS staff sample, again providing evidence of discriminant and criterion validity for disagreement, interference, and negative emotion. On the other hand, correlations between interdependence and the other four constructs were all non-significant, once more casting doubt on its inclusion in assessments of interpersonal conflict.

Dimensionality of Interpersonal Conflict in the IS Staff Sample

Based on the above results indicating a lack of convergent and criterion validity for interdependence, this construct and its indicators were excluded from further analyses.[5] The dimensional structure of interpersonal conflict was then investigated to determine whether it would be better represented as a single, unidimensional construct (with all 10 remaining indicators reflecting interpersonal conflict), or as a second-order multidimensional construct (with interpersonal conflict as a global, latent construct reflecting the three underlying dimensions of disagreement, interference, and negative emotion).

First, the hypothesized second-order multidimensional model was investigated using the IS staff data. The results, reported in Figure 5a, show that a very good overall fit was achieved by the model. While the Chi-square test was significant (Robust Chi-square = 123.00, df = 61, p < .001), the other two fit indices were above their recommended threshold levels (Robust CFI = .94; AASR = .028). As shown in Figure 5a, first-order factor loadings for the four constructs (disagreement, interference, negative emotion, and the interpersonal conflict criterion) were good, ranging from .64 to .88, with an average loading of .79. The second-order factor loadings were .89 for disagreement, .84 for interference, and .93 for negative emotion, with an internal consistency reliability of .88 achieved for interpersonal conflict. Further, the correlation between interpersonal conflict and the interpersonal conflict criterion was .96, providing strong evidence of criterion validity, and support for H2.

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[5] The SEM models just examined assessed the linear relationships between interdependence and the other three dimensions of interpersonal conflict, as well as with the interpersonal conflict criterion. A series of regression analyses, not reported here, were also conducted in which quadratic and interactive effects of interdependence were investigated (as independent variables predicting the interpersonal conflict criterion). In no case, for either sample, were the linear, quadratic, or interactive effects of interdependence found to be significant. These results add to our confidence that an assessment of interdependence is not required for an assessment of individuals' perceptions of interpersonal conflict.

Next, the unidimensional model of interpersonal conflict was analyzed. As anticipated, the fit of this model was relatively poor (Robust Chi-square = 219.44, df = 64, $p < .001$; Robust CFI = .85; AASR = .047). Further, being nested, the first and second-order models can be compared. The Chi-square difference between the two models was 96.44 (df = 3, $p < .001$), indicating the three-dimensional model of interpersonal conflict fit the data significantly better than the unidimensional model. Together, these results support H1.

Dimensionality of Interpersonal Conflict in the User Sample

The hypothesized second-order multi-dimensional model was next analyzed using the data from the user sample. Results are reported in Figure 5b. As can be seen, a very good overall fit was achieved by the model. While the Chi-square test was significant (Robust Chi-square = 110.00, df = 61, $p < .001$), the other two fit indices were above their recommended threshold levels (Robust CFI = .96; AASR = .041). As shown in Figure 5b, first-order factor loadings for the four constructs (disagreement, interference, negative emotion, and the interpersonal conflict criterion) were good, ranging from .60 to .89, with an average loading of .81. The second-order factor loadings were .80 for disagreement, .88 for interference, and .95 for negative emotion, with a construct reliability of .91 for interpersonal conflict. Further, the correlation between interpersonal conflict and the interpersonal conflict criterion was .94, providing strong evidence of criterion validity and supporting H2.

Again, analysis of the unidimensional model of interpersonal conflict resulted in a relatively poor fit (Robust Chi-square = 188.68, df = 64, $p < .001$; Robust CFI = .91; AASR = .042). Further, the Chi-square difference between the two models was 78.68 (df = 3, $p < .001$), indicating the multi-dimensional model of interpersonal conflict fit the data significantly better than the unidimensional model. These results support H1.

Multi-Sample Analysis of the Second-Order Model of Interpersonal Conflict

The above results suggest interpersonal conflict is a second-order multi-dimensional construct reflected by disagreement, interference, and negative emotion. While indicating that interpersonal conflict is reflected by the same three dimensions

and indicators in both samples, the results say little about the cross-sample equivalence of first and second-order factor loadings. Different loadings across two samples would imply different interpretations and/or meanings attached to model constructs. On the other hand, equivalence of first and second-order factor loadings across two samples will increase our confidence in the generalizability of the hypothesized structure of interpersonal conflict.

To investigate this question, a multi-sample SEM analysis examining two nested models was conducted. In the first model, no cross-group equality constraints were imposed. In the second model, cross-group equality constraints were imposed on the first and second-order factor loadings (i.e., the loadings of indicators with their dimensions, and the loadings of dimensions with interpersonal conflict). To the extent that the imposed cross-sample equality constraints do not significantly worsen model fit, evidence of generalizability is obtained. The Chi-squares were 398.71 (df = 122) and 414.38 (df = 135), for the unconstrained and constrained models, respectively. The Chi-square difference between the two models was 15.67 and not significant (df = 13), indicating that the cross-sample equality constraints did not worsen model fit. Further, LaGrange Multiplier tests of the constrained model indicated that each model constraint, tested individually, did not worsen model fit. These results provide strong cross-validation evidence for the model of Figures 4a and 4b, suggesting users and IS staff have very similar conceptions of interpersonal conflict.

Stage Two: Interpersonal Conflict, Conflict Management Styles, and ISD Outcomes

Tables 1 and 2 present the results of the SEM analyses examining the hypothesized relationships between interpersonal conflict, conflict management styles, satisfactory conflict resolution, and ISD outcomes that were depicted in Figure 3. As can be seen in Table 1, a very good overall fit was achieved for the IS staff sample. While the Chi-square test was significant (Chi-square = 203.86, df = 140, $p < .001$), both the CFI

Table 1. SEM Fit Statistics and Model Parameters for the Relationships between Interpersonal Conflict, Conflict Management Styles, Satisfactory Conflict Resolution, and ISD Outcomes: IS Staff (N = 245)

SEM Fit Statistics:
Chi-Square: 203.86, df = 140, p < .001
CFI: .97
AASR: .023

1A. SEM Correlations: Interpersonal Conflict and Conflict Management Styles

	Interpersonal Conflict	Problem-Solving	Asserting	Avoiding	Compromising	Accommodating
	H3					
Problem-Solving	-.36**	–				
Asserting	.25***	-.02	–			
Avoiding	.31***	-.25***	.16*	–		
Compromising	-.20**	.50***	.07	.01	–	
Accommodating	-.12°	.18**	.08	.09	.40***	–

1B. SEM Parameters: Predicting Satisfactory Conflict Resolution from Conflict Management Styles

		Problem-Solving	Asserting	Avoiding	Compromising	Accommodating	Explained Variance
Satisfactory Conflict Resolution	H5	.27***	-.17**	-.23***	.07	-.01	22.2%

Table 1. Continued

1C. SEM Correlations: ISD Outcomes

	Process Satisfaction	System Quality	Adherence to Budget	Adherence to Schedule	Adherence to Specifications	Overall Success
Process Satisfaction	—					
System Quality	.37***	—				
Adherence to Budget	.22***	.24***	—			
Adherence to Schedule	.32***	.21**	.49***	—		
Adherence to Specifications	.16*	.25*	.21**	.25***	—	
Overall Success	.25***	.26***	.28***	.28***	.14*	—

1D. SEM Parameters: Predicting ISD Outcomes from Interpersonal Conflict, Conflict Management Styles and Satisfactory Conflict Resolution

	Interpersonal Conflict	Problem-Solving	Asserting	Avoiding	Compromising	Accommodating	Satisfactory Conflict Resolution	Explained Variance
	H4	H7	H7	H7	H7	H7	H6	
Process Satisfaction	-.28**	.11	.02	-.07	.07	.10	-.02	16.6%
System Quality	-.18*	.24***	.13*	-.02	.03	.08	.20**	27.4%
Adherence to Budget	-.32***	.05	.03	.08	.02	.07	.08	15.4%
Adherence to Schedule	-.28**	.04	.06	.01	-.06	.17*	.03	12.6%
Adherence to Specifications	-.18o	-.04	-.03	-.04	.17*	.04	-.11	5.9%
Overall Success	-.37***	.00	.03	-.16**	-.02	.08	.07	24.0%

o p < .10   * p < .05   ** p < .01   *** p < .001

Table 2. SEM Fit Statistics and Model Parameters for the Relationships between Interpersonal Conflict, Conflict Management Styles, Satisfactory Conflict Resolution, and ISD Outcomes: Users (N = 175)

SEM Fit Statistics:
Chi-Square: 251.78, df = 149, p < .001
CFI: .95
AASR: .025

2A. SEM Correlations: Interpersonal Conflict and Conflict Management Styles

	Interpersonal Conflict	Problem-Solving	Asserting	Avoiding	Compromising	Accommodating
	H3					
Problem-Solving	-.35**	—				
Asserting	.34***	-.02	—			
Avoiding	.40***	-.39***	.07	—		
Compromising	-.05	.38***	.17*	-.14○	—	
Accommodating	.18*	.13○	.20**	.07	.23**	—

2B. SEM Parameters: Predicting Satisfactory Conflict Resolution from Conflict Management Styles

	Problem-Solving	Asserting	Avoiding	Compromising	Accommodating	Explained Variance
	H5					
Satisfactory Conflict Resolution	.28***	-.12**	-.29***	-.01	-.01	24.3%

Table 2. Continued

2C. SEM Correlations: ISD Outcomes

	Process Satisfaction	System Quality	System Attitude	Adherence to Budget	Adherence to Schedule	Adherence to Specifications	Overall Success
Process Satisfaction	—						
System Quality	.41***	—					
System Attitude	.34***	.54***	—				
Adherence to Budget	.29***	.20*	.11	—			
Adherence to Schedule	.22**	.15*	.07	.57***	—		
Adherence to Specifications	.16*	.11	.13	.21**	.16*	—	
Overall Success	.47***	.44***	.40***	.20*	.19*	.16*	—

2D. SEM Parameters: Predicting ISD Outcomes from Interpersonal Conflict, Conflict Management Styles and Satisfactory Conflict Resolution

	Interpersonal Conflict	Problem-Solving	Asserting	Avoiding	Compromising	Accommodating	Satisfactory Conflict Resolution	Explained Variance
	H4	H7	H7	H7	H7	H7	H6	
Process Satisfaction	-.36***	.06	.09	-.07	.02	.03	.25**	27.2%
System Quality	-.25*	.16o	.14o	-.01	-.09	.01	.18*	20.4%
System Attitude	-.08	.15o	.18*	-.01	-.03	.02	.22**	14.4%
Adherence to Budget	-.24*	-.05	-.09	-.11	-.05	.12	.10	14.3%
Adherence to Schedule	-.28*	-.09	.03	-.04	.06	.01	.06	9.6%
Adherence to Specifications	-.22*	-.09	.03	-.08	.08	-.08	.05	8.0%
Overall Success	-.21*	.00	.22**	-.05	-.01	-.10	.28**	22.4%

o $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

and AASR indices exceeded their recommended threshold levels (CFI = .97; AASR = .023). As shown in Table 2, a good fit was also achieved for the user sample. Again the Chi-square test was significant (Chi-square = 251.78, df = 149, $p <$ .001), but both the CFI and AASR indices exceeded their recommended threshold levels (CFI = .95; AASR = .025).[6]

Not shown in Tables 1 and 2, interpersonal conflict had construct reliabilities of .92 and .94, in the IS staff and user samples, respectively, with dimensional loadings of .90 and .84 for disagreement, .87 and .96 for interference, and .89 and .96 for negative emotion. These results are consistent with those of stage one, and provide additional support for the second-order, multidimensional model of interpersonal conflict.

As can be seen in Tables 1A and 2A, interpersonal conflict had a significant negative relationship with problem-solving and significant positive relationships with asserting and avoiding. These results were observed both in the IS staff and user samples, strongly supporting H3. As can be seen in Tables 1B and 2B, problem-solving was also found to have a significant positive relationship, whereas asserting and avoiding had significant negative relationships, with satisfactory conflict resolution. Again, these results were observed both in the IS staff and user samples and support H5 (although asserting was significant only at the p < .10 level in the user sample). While not hypothesized, interpersonal conflict was found to have a significant negative relationship with satisfactory conflict resolution (-.40 and -.36

for the IS staff and user samples, respectively, both p's < .001), suggesting that smaller conflicts are more likely to be satisfactorily resolved and confirming Robey et al. (1989).

Results concerning the effects of interpersonal conflict, conflict management styles, and satisfactory conflict resolution on ISD outcomes are shown in Tables 1D and 2D. As can be seen, interpersonal conflict, as well as its management and resolution, explained an average of 17% of the variance in all ISD outcomes, for both the IS staff and user samples. These are strong results, especially when one considers the plethora of factors that can influence ISD outcomes, and underscore the importance and impact of conflict and conflict management in ISD. Results concerning H4 are shown in the first column of Tables 1D and 2D. As can be seen, the paths between interpersonal conflict and ISD outcome variables in the IS staff sample were significant and negative for five of six outcome variables (with the sixth significant at p < .10). Similarly, significant and negative paths were found between interpersonal conflict and six of seven ISD outcome variables in the user sample. These results provide consistent support for H4. Further, because the five conflict management styles and satisfactory conflict resolution are present as predictors of ISD outcomes in the SEM model being analyzed, these results provide a strong test of H4. In other words, the negative effects of interpersonal conflict were present even after the effects of conflict management styles and satisfactory conflict resolution were accounted for.[7]

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[6]Since SEM analyses require complete data for all variables, sample sizes of the stage two analyses were smaller than those of stage one due to missing data for some ISD outcome variables. Specifically, 20 cases were lost from the IS staff sample (265 vs. 245 cases) and 97 cases were lost from the user sample (272 vs. 175). The relatively large loss in the user sample was mainly due to users' lack of information regarding the adherence to budget and system quality variables. To check on the generalizability of the reported analysis, another SEM analysis was performed for the user sample without these two variables (i.e., using only the five remaining ISD outcomes). This analysis had a sample size of 250, and also yielded a good fit for the data (Chi-square = 283.79, df = 131, p < .001; CFI = .93; AASR = .027). More importantly, there were no significant changes in the model paths reported in Table 2, indicating that the loss of cases had no effect on the main results being reported.

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[7]A series of hierarchical regression analyses were also conducted to examine whether the relationships between interpersonal conflict and ISD outcomes were significant and negative, even when the interactive effects of interpersonal conflict and each of the five conflict management styles were also taken into account. Interpersonal conflict had a significant negative effect on ISD outcomes in 12 of the 13 regressions (six for the IS staff and seven for the user sample), both before and after the addition of the interactive effects. These results add to our confidence that interpersonal conflict had a negative effect on ISD outcomes, regardless of how it was managed or resolved.

The remaining findings reported in Tables 1D and 2D focus on the effect of conflict management styles (H7) and resolution (H6) on ISD outcomes. As can be seen in the middle five columns of both tables, five of 30 conflict management style—ISD outcome paths were significant in the IS staff sample, and two of 35 conflict management style—ISD outcome paths were significant in the user sample. Further, no discernable pattern appears to exist in paths found to be significant. Overall, these results provide little support for H7 and suggest that the impact conflict management styles had on ISD outcomes were mediated by satisfactory conflict resolution. The effect of satisfactory conflict resolution on ISD outcomes is shown in the second to last column of Tables 1D and 2D. As can be seen, satisfactory conflict resolution had a significant positive relationship with only one of six ISD outcomes in the IS staff sample, and with four of seven ISD outcomes in the user sample. These results suggest that satisfactory conflict resolution mainly influenced users' perceptual and attitudinal outcomes (i.e., process satisfaction, system quality, system attitude, and overall success), and provide weak support for H6.

Discussion ▌▌▌▌▌▌▌▌▌

Conflict is an important organizational process and likely to remain so in the foreseeable future. While a vast conflict literature exists in different fields (e.g., psychology, communication, organizational behavior, and marketing), much of this work has focused on conflict management and resolution, to the relative detriment of studying the meaning, measurement, and impact of interpersonal conflict per se. This has resulted in a literature that lacks an agreed upon conceptualization or definition of interpersonal conflict. Validated measures of interpersonal conflict are also lacking. Further, researchers assessing interpersonal conflict have tended to use measures that are both limited in focus (with most assessing a single dimension) and biased toward a particular dimension (disagreement). This paper provides a theoretically sound conceptualization

and assessment of interpersonal conflict enabling a better understanding of its antecedents, processes, and outcomes.

Four fundamental properties of interpersonal conflict were identified in the conflict literature: interdependence, disagreement, interference, and negative emotion (Amason 1996; Jehn 1995; Putnam and Poole 1987; Thomas 1976, 1992a, 1992b; Wall and Callister 1995). Interpersonal conflict was, therefore, defined as a phenomenon that occurs between interdependent parties as they experience negative emotional reactions to perceived disagreements and interference with the attainment of their goals. Based on this definition, a structural model was developed and examined, hypothesizing interpersonal conflict as a second-order multi-dimensional construct reflected by these definitional properties. Results supported the hypothesized model, indicating that it accurately depicted how individuals perceive interpersonal conflict. Specifically, interpersonal conflict was found to reflect disagreement, interference, and negative emotion. Together, these three dimensions shared large common variance and yielded high internal consistency reliabilities for interpersonal conflict. Further, interpersonal conflict had a very strong relationship with the interpersonal conflict criterion (r's of .96 and .94, IS staff and user samples, respectively).

No empirical support was found for interdependence as a dimension of interpersonal conflict. Clearly, interdependence is objectively necessary for interpersonal conflict to exist (Van de Ven et al. 1976). As members of ISD teams, all respondents of the study were in interdependent relationships. However, no association was found between respondents' appraisals of interdependence and the other three dimensions of interpersonal conflict, or between interdependence and the criterion measure of interpersonal conflict. Further, regression analyses did not find any significant linear or quadratic relationships of interdependence, or interactive relationships of interdependence and the other three dimensions, with overall conflict. These results suggest that individuals' perceptions of interpersonal conflict do not incorporate an appraisal

of interdependence.[8] This is a surprising finding since interdependence has been identified as a key property of interpersonal conflict in past research. However, the finding seems quite logical if it is considered that individuals do not typically factor in a myriad of contextual or background pre-conditions (e.g., being employed, being on the project team, or even being alive) when appraising interpersonal conflict. In other words, they are unlikely to consider their being on the project team, their being employed, or their being alive when thinking about the presence of interpersonal conflict in ISD. We believe that interdependence acts as a similar contextual, background factor. On the other hand, as salient and focal events, disagreement, interference, and negative emotion form the basis of individuals' appraisals of interpersonal conflict. As such, they represent "figure" whereas interdependence and other contextual factors represent "ground."

An important aspect of the study's research design was the use of two samples, IS staff working on ISD projects and future users who were participating in these projects. Users and IS staff are generally thought to belong to distinctly different organizational cultures, with differences in education, training, work goals, objectives, and peer groups (Gingras and McLean 1982; Robey et al. 1989; Smith and McKeen 1992). A multi-sample covariance structure analysis indicated that perceptions of interpersonal conflict were described by an identical model in both samples. Given the user and IS staff differences, this cross-validation evidence is particularly strong, and provides not only replication evidence for the model of interpersonal conflict, but also evidence of its generalizability. Together, the results provide compelling evidence that disagreement, interference, and negative emotion capture much of what individuals have in mind when they assess interpersonal conflict.

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[8]While our results indicate interdependence is not related to interpersonal conflict, they do not imply that it is unrelated to ISD outcomes. Indeed, past research has found a positive association between interdependence and group effectiveness (Jehn 1995; Wageman 1995).

The Negative Impact of Interpersonal Conflict

While the normative literature suggests that interpersonal conflict is by itself neither good nor bad, results of the present study challenge this view. Our conceptualization of interpersonal conflict incorporates negative emotion as a definitional property of the construct. Supporting this inclusion, negative emotion shared significant common variance with the other definitional properties, indicating that negative emotion is an integral component of individuals' perceptions of interpersonal conflict. That is, experientially, interpersonal conflict is negative. The study findings indicated that interpersonal conflict consistently and negatively affected ISD outcomes, and also that significant negative effects of interpersonal conflict remained, even after controlling for the effects of conflict management and resolution, and even for respondents reporting high levels of satisfactory conflict resolution. As such, it can be concluded that interpersonal conflict is not only a negative experience, but also that it negatively affects ISD outcomes, even when managed well.

These findings raise questions concerning suggestions in the normative literature that some conflict can be stimulating (Filley 1978) and that, when managed well, conflict can be beneficial (Deutsch 1990; Pondy 1967). They also contrast with studies suggesting positive effects of interpersonal conflict. An explanation for this difference may lie in our more complete assessment of interpersonal conflict. As mentioned earlier, past studies have generally measured disagreement, not interference or negative emotion, when assessing interpersonal conflict. In doing so, researchers who have argued for conflict's positive effects may have confused debate, disagreement, and divergent goals with conflict (Wall and Callister 1995). As the results of the present study show, when adequately measured, interpersonal conflict has a pervasive negative impact on ISD outcomes. This points to the importance of preventing or minimizing interpersonal conflict. As Wall and Callister (1995) noted:

> The effects expected from moderate conflict—namely creativity, problem aware-

ness, adaptation and self-awareness—can be better achieved through other means. More importantly, the downside risks of creating conflict are substantial; not only does conflict have significant negative effects, it also has a pernicious tendency to escalate (p. 526).

Two further points related to this issue need to be clarified. First, minimizing or preventing conflict does not mean that we are arguing for the elimination of drive and passion, or against the utility of having spirited discussions and debates. These are helpful in developing creative and novel solutions to some of the many challenges and problems typically raised by ISD projects. It should be noted that such actions can spark interpersonal conflict. Thus, a key issue that future research needs to address is the discovery of means that can encourage individual passion, drive, and involvement without fostering conflict. Second, our results do confirm that management of interpersonal conflict and its satisfactory resolution are important. Some conflict is inevitable and will need to be managed. This does not, however, eliminate the need to focus greater attention on preventing interpersonal conflict; as the saying goes, "an ounce of prevention is worth a pound of cure."

Study Limitations and Future Research

This study did not include positive emotions (e.g., excitement, exhilaration) as a possible dimension of interpersonal conflict. Consequently, it could be argued that the study has undertaken an incomplete assessment of interpersonal conflict and obtained results biased toward conflict's negative effects. However, the results suggest that this is unlikely. The very high correlations obtained between individuals' perceptions of interpersonal conflict (i.e., the criterion measure of interpersonal conflict) and the construct of interpersonal conflict (based on assessments of disagreement, interference, and negative emotion) do not leave much room (i.e., explained variance) for the addition of dimensions other than the three assessed here. It should also be noted that the present study's results concerning the effects of interpersonal

conflict on ISD outcomes were replicated with the criterion measure of interpersonal conflict. As such, the study's key findings concerning the negative impact of interpersonal conflict are unlikely to have been biased by the omission of positive emotion from its assessment.

An important objective of our study was to define the key dimensions of interpersonal conflict and assess the extent to which individuals' perceptions of this construct were captured by these dimensions. To do so, retrospective perceptions of interpersonal conflict were assessed using a cross-sectional design. While disagreement, interference, and negative emotion were identified and empirically supported as the key dimensions of interpersonal conflict, additional work is needed to investigate the causal interplay between them. Multiple causal links are likely to exist as specific episodes or events unfold during a conflict situation. Often, disagreements between two parties concerning a particular issue will lead to subsequent interference by one or both parties, which may result in negative emotions. However, repercussions of these negative emotions are also likely, inducing further disagreement and/or interference with this or other issues. Having established that these three dimensions are the key underpinnings of interpersonal conflict, research now needs to turn its attention to studying their respective roles in the emergence, escalation, and resolution of interpersonal conflict.

The present study assessed conflict management styles from a general, strategic perspective (e.g., Putnam and Wilson 1982; Rahim 1983; Thomas 1992b). While this is appropriate for assessing respondents' overall perceptions of what transpired throughout a project, such assessments say little about specific tactics and behaviors. Research has shown the importance of structural contingencies (e.g., which style to use under what circumstances), sequential strategies (e.g., which style to use in what order), and reciprocal behavior patterns (e.g., which style to use in response to others' behaviors) for an in-depth understanding of conflict episodes (Knapp et al. 1988). A fruitful avenue for future research would be to link the present study's general perspective of interpersonal conflict and conflict management styles to their more specific manifestations.

The results of the present study indicate that multidimensionality is a key consideration for the assessment of interpersonal conflict and suggest that assessments of interpersonal conflict need to include assessments of disagreement, interference, and negative emotion. The presence of three distinct dimensions also suggests the possibility of different types or forms of conflict. For example, some conflict episodes may be more cognitive than behavioral (focusing primarily on the parties' disagreements); others may be more behavioral than cognitive (involving primarily acts of interference by one or the other party); still others may be either heavily affective (with strong negative emotions) or not (with parties being cool, calm, and calculating). Investigating the emergence, presence, and consequences of different conflicts should prove useful to a better understanding of the construct of interpersonal conflict in ISD, as well as in other contexts.

Conclusion ■■■■■■■■■

As our review of the literature and empirical results have shown, interpersonal conflict is a neglected yet important topic in ISD. Our results indicate interpersonal conflict is reflected by three key dimensions: disagreement, interference, and negative emotion. Any conceptualization and empirical assessment of the construct needs to include all three. The results also show that, contrary to what some researchers and practitioners suggest, individuals perceive interpersonal conflict negatively. Also, interpersonal conflict impacts ISD outcomes negatively. Moreover, while conflict management had some positive effects on ISD outcomes, it did not substantially mitigate the negative effects of interpersonal conflict. In other words, the impact of interpersonal conflict was perceived to be negative, regardless of how it was managed or resolved. Consequently, ISD researchers and practitioners need to direct greater effort toward assessing the antecedents and prevention of interpersonal conflict.

Acknowledgments

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Appendix

Items for [User][IS Staff] Questionnaire ▇▇▇▇▇▇▇▇▇▇

Interpersonal Conflict Items

INTERDEPENDENCE

1. Did project success depend on the joint collaboration of the [IS staff] [users] and yourself?
2. Did senior management encourage the joint collaboration of users and the IS staff for the project?
3. Did the [IS staff] [users] depend on you in order to accomplish their project work?
4. Did you depend on the [IS staff] [users] in order to accomplish your project work?

DISAGREEMENT

5. Were there important opinion differences between you and the [IS staff] [users] concerning the goals and objectives of the system?
6. Were there important opinion differences between you and the [IS staff] [users] concerning the physical design of the system (e.g., inputs, screens, menus, report formats, etc.)?
7. Were there important opinion differences between you and the [IS staff] [users] concerning when or how the system should be implemented?
8. Were there important opinion differences between you and the [IS staff] [users] concerning how the project should be managed (e.g., staffing the project team, calling and running meetings, reporting to senior management, etc.)?

INTERFERENCE

9. Did the [IS staff] [users] block or prevent you from attaining your system goals and objectives?
10. Did you block or prevent the [IS staff] [users] from attaining their system goals and objectives?
11. Did the [IS staff] [users] block or prevent you from achieving the physical design that you desired?
12. Did you block or prevent the [IS staff] [users] from achieving the physical design that they desired?

13. Did the [IS staff] [users] block or prevent you from implementing the system in the way you desired?
14. Did you block or prevent the [IS staff] [users] from implementing the system in the way they desired?
15. Did the [IS staff] [users] block or prevent you from managing the project in the way you desired?
16. Did you block or prevent the [IS staff] [users] from managing the project in the way they desired?

NEGATIVE EMOTION

17. During the project, did the [IS staff] [users] do things which made you feel frustrated?
18. During the project, did you do things which made the [IS staff] [users] feel frustrated?
19. During the project, did the [IS staff] [users] do things which made you feel angry?
20. During the project, did you do things which made the [IS staff] [users] feel angry?

Interpersonal Conflict Criterion Items

21. How much conflict was there between you and the [IS staff] [users] concerning this project?
22. How often did conflicts occur between you and the [IS staff] [users] concerning this project?
23. How intense were the conflicts between you and the [IS staff] [users] concerning this project?

Conflict Management Style Items

PROBLEM-SOLVING

24. When you disagreed with the [IS staff] [users], did you suggest that you work together to create solutions?
25. When you disagreed with the [IS staff] [users], did you try to bring both parties' concerns out into the open so that you could find a joint solution?
26. When the [IS staff] [users] disagreed with you, did they suggest that you work together to create solutions?
27. When the [IS staff] [users] disagreed with you, did they try to bring both parties' concerns out into the open so that you could find a joint solution?

ASSERTING

28. In situations where you disagreed with the [IS staff] [users], did you insist that your position be accepted?
29. In situations where you disagreed with the [IS staff] [users], did you stand firm in expressing your viewpoints?
30. In situations where the [IS staff] [users] disagreed with you, did they insist that their position be accepted?
31. In situations where the [IS staff] [users] disagreed with you, did they stand firm in expressing their viewpoints?

AVOIDING

32. Did you avoid discussions with the [IS staff] [users] when confrontations were likely to occur?
33. When you disagreed with the [IS staff] [users], did you keep your opinions to yourself?

34. Did the [IS staff] [users] avoid discussions with you when confrontations were likely to occur?
35. When the [IS staff] [users] disagreed with you, did they keep their opinions to themselves?

COMPROMISING

36. When you disagreed with the [IS staff] [users], did you offer trade-offs to reach a middle-ground solution?
37. When you disagreed with the [IS staff] [users], did you compromise to reach an acceptable solution?
38. When the [IS staff] [users] disagreed with you, did they offer trade-offs to reach a middle-ground solution?
39. When the [IS staff] [users] disagreed with you, did they compromise to reach an acceptable solution?

ACCOMMODATING

40. When you disagreed with the [IS staff] [users], did you go along with their wishes?
41. When you disagreed with the [IS staff] [users], did you give in to their suggestions?
42. When the [IS staff] [users] disagreed with you, did they go along with your wishes?
43. When the [IS staff] [users] disagreed with you, did they give in to your suggestions?

ISD Outcome Items

SATISFACTORY CONFLICT RESOLUTION

44. Were opinion differences between you and the [IS staff] [users], if any, resolved to the mutual satisfaction of both parties?
45. Were opinion differences between you and the [IS staff] [users], if any, resolved to your own personal satisfaction?
46. Were conflicts between you and the [IS staff] [users], if any, resolved to the mutual satisfaction of both parties?
47. Were conflicts between you and the [IS staff] [users], if any, resolved to your own personal satisfaction?

PROCESS SATISFACTION

48. How dissatisfied or satisfied are you with the process of system development?
49. How dissatisfied or satisfied are you with the composition of the project team?
50. How dissatisfied or satisfied are you with the [IS staff] [users] who worked on the project?
51. How dissatisfied or satisfied are you with other [users] [IS staff] who worked on the project?
52. How dissatisfied or satisfied are you with the functioning of the project team?
53. How dissatisfied or satisfied are you with how the project was managed?

SYSTEM QUALITY

54. The system is reliable (it is always up and running, runs without errors, and does what it is supposed to do).
55. It is easy to tell whether the system is functioning correctly.

56. The system can recover from errors, accidents, and intrusions while maintaining data security and integrity.
57. The system can easily be modified to meet changing user requirements.
58. The system can easily be adapted to a new technical or organizational environment.
59. The system is easy to maintain.
60. The system is easy to understand.
61. The system is easy to use.
62. The output information produced by the system is precise.
63. The output information produced by the system is complete.
64. The output information produced by the system is useful.
65. The output information produced by the system is up to date.
66. The output information produced by the system is reliable.
67. The system performs its functions quickly.

SYSTEM ATTITUDE

68. For you, personally, the system is (bad/good).
69. For you, personally, the system is (terrible/terrific).
70. For you, personally, the system is (useless/useful).
71. For you, personally, the system is (worthless /valuable).

ADHERENCE TO PROJECT BUDGET

72. Compared to its estimated cost, the project was completed (Way under/Under/On/Over/Way over) budget.

ADHERENCE TO PROJECT SCHEDULE

73. Compared to its estimated schedule, the project was completed (Much earlier than scheduled /Earlier than scheduled/On time/Later than scheduled /Much later than scheduled).

ADHERENCE TO PROJECT SPECIFICATIONS

74. Compared to its original specifications, the scope of the completed project is (Much smaller than promised/Smaller than promised /Meeting the original specifications/Larger than promised/Much larger than promised).

OVERALL PROJECT SUCCESS

75. Overall, I consider this project to have been (Unsuccessful/Somewhat unsuccessful/Neither successful nor unsuccessful/Somewhat successful/Successful).