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Attributional Bias as a Source of Conflict Between Users and Analysts in an Information Systems Development Context—Hypotheses Development

Kenneth C. Snead, Jr.[1] and Atieno A. Ndede-Amadi[1,2]

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One potential obstacle to effective information systems development involves the conflict between users and developers. It has been argued that information systems development personnel have different perceptions of what constitutes systems effectiveness than do users. System objectives are accomplished from the developer's viewpoint when a system has technical validity. System objectives are accomplished from the user's viewpoint when the system has organizational validity. Differences in the assessment of information systems project success are accentuated when users perceive the project as a failure. Attribution theory, a social psychology theory, is employed here to explain the source and outcome of such conflict. Also discussed are alternative ways of resolving those differences.

KEY WORDS: analyst; attribution; bias; developer; systems; user.

1. INTRODUCTION

Organizations allocate large sums of resources to the information systems (systems) development process, obviously assuming that the development efforts will generate successful systems that will improve the organization's performance. Unfortunately, many development efforts are unsuccessful, resulting in inferior systems that are less than effective or potentially effective systems that are not embraced by intended system users (users) (Newman and Robey, 1992; Jiang *et al.*, 1998). One potential obstacle to effective systems development discussed in the information systems (IS) literature involves the potential conflict between users and systems development analysts (developers).

[1]Department of Accounting and Management Information Systems, Bowling Green State University, 357 Business Building, Bowling Green, Ohio 43403.
[2]To whom correspondence should be addressed. e-mail: aamadi@cba.bgsu.edu.

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2. USER AND ANALYST CONFLICT

Systems development activities provide a natural context for conflict between users and developers; each group has resource and other organizational constraints and is protecting its own interests. Research suggests that perceptual differences exist between users and developers, which is of concern for the effective partnership necessary between the two parties for successful systems development efforts (Green, 1989). Specifically, it has been argued that systems development personnel have different perceptions of what constitutes system effectiveness than do users. "System objectives are accomplished from the developer's viewpoint when the system is developed and works (technical validity), and system objectives are accomplished from the user's viewpoint when the system is used by decision makers and is compatible with existing organizational practices and user needs (organizational validity)." Ginzberg (1989) noted that "differences in the assessment of MIS project success, i.e., accomplishment of objectives, were accentuated when users perceived the project as a failure" (Hamilton and Chervany, 1981; Newman, 1999).

Newman and Robey (1992) recognize that systems development is a social process, involving system-related episodes and encounters involving users and developers. Of particular interest is their description of three possible responses to new claims made in an initial encounter between users and developers: acceptance, rejection, and equivocation. Acceptance involves an acknowledgment of the legitimacy of the claim and is normally followed by an episode involving no conflict. Equivocation involves a neutral response which neither accepts nor rejects the legitimacy of the claim and is most prone to subsequent intervention by parties external to the user-analyst relationship. The most concerning response, rejection, involves a rejection of new claims presented and will likely result in destructive conflict between users and developers. In an organizational context, if users "win," then future systems development processes will be user dominated; if analysts "win," then subsequent systems development processes will likely be dominated by analysts.

Robey and Farrow (1982) note that systems development is a process of introducing technical and social change to an organization. They argue that this change process provides opportunities for episodes of conflict to exist at all stages of the development process: provisional, feasibility, system design, and changeover/implementation. They note further that "constructive" as opposed to "destructive" conflict is desirable, as constructive conflict involves the encouragement of problem solution and the prevention of domination by a particular group. Destructive conflict, on the other hand, potentially reduces cooperation/teamwork, fosters hostility, and generally leads to a "win" or "lose" attitude by those involved. These authors demonstrate the influence of user participation and user influence on conflict and conflict resolution for all stages of the systems development process.

Robey *et al.* (1989) found that the systems development process offers the potential for conflict but that managing the conflict "is a critical but often overlooked aspect of systems development." Perhaps the conflict potential is deliberately overlooked, as the behavioral implications of change are the hardest for the systems development personnel to manage (Lucas, 1975; Marakas, 2000).

The above discussion shows that episodes of conflict between users and developers are nearly inevitable during systems development. In support of this notion, Markus (1983) notes that the degree to which users and systems designers are able to negotiate and resolve differing views is the degree to which the resulting system will successfully "fit" into the organization. As can be expected, systems development conflict resolution among system stakeholders (particularly systems analysts/designers and users) has been shown to have a significant positive influence on systems project success (Roby *et al.*, 1993). This means that system problems perceived by users during the testing and implementation/evaluation phases of the systems development process require a cooperative partnership between users and developers/designers to achieve successful resolution (Kendall and Kendall, 1995). Consequently, an effective interdependent system user/developer relationship is critical in the implementation phase, as extensive coordination between the two groups is required to transition from the predominantly technical system construction task to user-driven management of the system (Applegate *et al.*, 1996; Newman, 1999).

McKeen *et al.* (1994) argue that the quality of communication between users and developers will indirectly affect the relationship between user participation and user satisfaction. They found, however, that user–developer communication directly impacts user satisfaction, highlighting the importance of identifying causes of, and resolutions to, user–developer conflict.

Lucas (1975) noted the importance of the dyadic relationship between users and developers: "The relationship between analysts and users could translate directly to success or failure of major development projects." Watson (1982) states, "The evidence gathered to date strongly indicates that people tend to attribute more importance to traits than to situations and that this tendency holds regardless of whether they are analyzing their own or another's behavior." Green (1989) notes that potential problems between these two groups may stem from perceptual differences. One finding of that study is that perceptual differences, with respect to the perceived importance of systems analysts' job skills, exist between users and developers; these disparate perceptions may become a major source of conflict.

In support of this, Yaverbaum (1989) argues that effective communication between user and analyst is necessary for the establishment of system requirements. Tan (1994) notes that effective communication between systems professionals (analysts) and their clients (users) is critical for the development of a mutual understanding between these two groups. Ponemon and Nagoda (1990) identify perceptual variation among members of a system implementation team to be a key variable for the success or failure of the system. Specifically, they find that high variability of perceptions among team members is associated with failed systems, while low variability of perceptions among team members is associated with successful systems.

The above discussion indicates that systems development is a social process of introducing technological change to an organization, involving interactions between users and developers (Robey and Farrow, 1982; Newman and Robey, 1992; Bennetts, 2000). Further, as a result of these interactions, conflict is likely to be experienced between the groups and often stems from system-related perceptual differences between analysts and users (Green, 1989; Hamilton and Chervany, 1981; Ponemon and Nagoda, 1990).

Attribution theory, a social psychology theory, is employed here to explain the source of this conflict. The theory is particularly relevant to this study, as it provides a conceptual framework based upon a social context that offers explanations for differences in outcome-related perceptions of individuals interacting in a social setting. Other researchers have noted the relevance of the tenets of attribution theory for the systems development area. For example, Hughes and Gibson (1987) used attribution theory to develop a model of a decision support system. Wong-On-Wing (1988) argued that attribution theory provides an appropriate conceptual framework for studying the role of user involvement in systems development. Green (1989) noted the relevance of attribution theory for explaining potential perceptual differences between system users and developers.

3. ATTRIBUTION THEORY

Attribution theory is the study of the process by which people associate causes with events or outcomes they experience (Jones and Davis, 1965; Kelley and Michela, 1980; Marakas, 2000). A major goal of the attributional process is to understand, organize, and form meaningful perspectives about and to predict and control such events and outcomes. This propensity to understand and control events is particularly great in the case of unexpected or negative outcomes, when outcome dependency is high, when involvement in the outcome is high, and when faced with the experience of lack of control (Kelley, 1967; Weary and Harvey, 1989). These are precisely the circumstances surrounding system use. The need for users to predict and control their system-related events has been identified as influencing their acceptance of, and satisfaction with, the system.

3.1. Attribution

Attributions are the inferences of causations individuals associate with a particular outcome or event. A common dimension of attribution for outcomes involving failure or success is locus of control (Jones and Davis, 1965; Kelley, 1967).

Locus of control is the degree to which a cause is believed to be related to factors within the person (internal) or to the environment (external). Other dimensions of attribution relate to the stability and controllability of the cause but are not germane to this study.

Four causal elements have been identified by Weiner (1974) and determined to be relevant in the interpretation of achievement-related outcomes: ability, effort, task difficulty, and luck. Ability is the characteristic of the person that describes his/her task-related capabilities. Effort is the personal characteristic related to the degree of persistence a person brings to bear upon a specific task. Task difficulty is the environmental characteristic related to the degree of challenge associated with task accomplishment, while luck relates to the influence of random (chance) environmental conditions.

Relating these causal elements to the locus of control dimension of attribution results in cataloging ability and effort as internal causes and luck and task difficulty as environmental or external causes. These causal elements have been widely used to operationalize attribution in a variety of research contexts. Examples of studies (and context) employing this approach include leadership/management (Shultz, 1994), sport psychology (Crocker, 1993; Mullen and Riordan, 1988), socioeconomic (Augoustinos, 1990), and social (Smith and Whitehead, 1988).

3.2. Attributional Bias

It is important to recognize that causal attributions formed by individuals may be inaccurate. In fact, previous attribution theory research has identified situations where individuals' causal attributions are likely to be systematically distorted, or biased. Two attributional biases are relevant to this study. The first, self-serving bias, a classic, motivationally driven pattern of attributions involving an individual identifying causes for his/her own behavior or for outcomes he/she directly experiences. This bias describes the predisposition of individuals to attribute failures to external causes and to attribute successes to internal causes (Miller, 1976; Miller and Ross, 1975; Zuckerman, 1979). Attributional bias studies report the existence of self-serving biases in a variety of research contexts. Examples of recent work indicating findings consistent with this bias include Forsyth (1996), Knee (1996), McAllister (1996), Watt (1994), Baron (1993), and Greenberg *et al.* (1992).

The second bias is referred to as the fundamental attribution error (also known as the actor–observer bias). Also of interest to this study is the attributional bias associated with an individual (an observer) attempting to identify causes for another person's (an actor or target) behavior or for outcomes experienced by the actor. The fundamental attribution error involves the "widespread tendency to attribute causes of behavior or outcomes to the internal characteristics of the person" (Tosi *et al.*, 1986). Thus, there is a pervasive tendency of attributors "... to overestimate the importance of personal or dispositional factors relative to environmental influences" (Ross, 1977). This tendency to overattribute causation to the actor and underattribute causation to the situation has been demonstrated in a variety of contexts: supervisory performance appraisals (Bernardin, 1989; Brown, 1984; Bartunek, 1981; Harrison *et al.*, 1988; Martin and Klimoski, 1990), achievement situations (Zaccaro and Lowe, 1985; Levi and Mainstone, 1987), and counseling and therapy situations (Roberts and McCready, 1987; Morrow and Deidan, 1992).

The organizational implications of these biases lie in the perceptual differences of causation between an actor and an observer. Consider a subordinate employee who has just experienced a job-related failure outcome; this individual is the "actor." Now consider the subordinate's boss (the "observer"), who is attempting to attribute causation to the subordinate's failure. The fundamental attribution error predicts that the supervisor will attribute the failure more to internal causes associated with the subordinate (lack of effort, lack of ability). However, the self-serving bias predicts the subordinate will likely attribute the failure to external causes (task difficulty, bad luck). The supervisor's attributions will then influence the selection of corrective actions (Brown, 1984), which are likely to be punitive in nature. This difference in perception of causation between actors and observers is likely to become a source of considerable conflict in organizations (Tosi *et al.*, 1986).

Mapping the essence of these attributional biases onto a systems development context, the self-serving bias predicts that users will attribute system-related failure outcomes they experience to external causes (task difficulty and luck) and success outcomes to internal causes (ability and effort). The fundamental attribution error (actor–observer bias) views analyst/designer personnel as "observers" of the outcomes directly experienced by system users ("actors") as a result of their interaction with the system. Consequently, developers will likely be predisposed to attribute system-related outcomes directly experienced by users to internal causes associated with the users, regardless of the "success"/"failure" nature of the outcome.

4. HYPOTHESES AND IMPLICATIONS

The initial set of hypotheses presented predicts that the attributional biases previously discussed generalize to the systems development area. With respect to the self-serving bias, the following hypotheses are advanced.

> H1a: The causal attributions of users for system-related failure outcomes they experience will be external.
>
> H1b: The causal attributions of users for system-related success outcomes they experience will be internal.

With respect to the fundamental attribution error (the actor–observer bias), the following hypotheses are advanced.

H2a: Relative to users (actors), the causal attributions of developers (observers) for system-related failure outcomes experienced by users will be more internal, or more directed at the user (actor).

H2b: Relative to users (actors), the causal attributions of developers (observers) for system-related success outcomes experienced by users will be more internal, or more directed at the user (actor).

The next set of hypotheses presented predicts certain consequences resulting from the presence of the attributional biases in the systems development area, presuming that H1a/b and H2a/b are confirmed. Consequences of the presence of these biases are predicted in three areas: information seeking following the outcome, conflict between users and developers, and user satisfaction with the system.

With respect to the information-seeking consequences, research literature suggests that attribution provides a tentative hypothesis for the individual making the attributions. The individual then engages in an information search to test the causally based hypothesis. Three potential information search strategies have been identified: (1) confirmatory hypothesis testing strategy, where information that would tend to confirm the attribution is sought; (2) disconfirmatory hypothesis testing strategy, where the information that would refute the attribution is sought; and (3) equal opportunity hypothesis testing strategy, where both confirming and refuting evidence is sought equally. Individuals prefer to search for information that would corroborate their initial hypothesis (attribution) and, thus, follow a confirmatory search strategy (Snyder and White, 1981). Accordingly, the following hypothesis related to postattribution information seeking is proposed.

H3: The nature of information sought (internal/external) following the system-related outcome will be correlated with the nature of attributions for both users and developers (internal/external).

With respect to the conflict consequences of attribution, it is expected that situations involving larger disparity of causal attributions between users and developers have the potential to generate greater conflict between the two groups. For example, the situation which will exacerbate disparate attributions between the two groups involves the failure outcome (see H1a and H2a). Accordingly, the following hypothesis is advanced, assuming confirmation of H2a/b.

H4: The degree of conflict between users and developers will be correlated with attributional differences between the two groups, after controlling for the success/failure nature of the system-related outcome.

With respect to the user satisfaction consequences of attribution, research shows that conflict is likely to be negatively related to user satisfaction. For example, Robey *et al.* (1993) found a significant negative relationship between conflict and "project" success and a positive relationship between conflict resolution and "project" success. McKeen *et al.* (1994) found significant positive association between user–developer communication and user satisfaction. Accordingly, the following hypothesis is advanced.

H5: The degree of conflict between users and developers will be negatively correlated with user satisfaction with the system, after controlling for the success/failure nature of the system-related outcome.

Hypotheses H1a/b and H2a/b argue that two robust attributional biases, the self-serving bias and the fundamental attribution error that have been observed in a variety of contexts, will likely also generalize to the systems development area. Confirmation of these hypotheses indicate that these biases are potentially the primary source of organizational conflict between users and developers (Tosi *et al.*, 1986) in the systems development process. As already discussed, this conflict has the potential to have a dysfunctional impact on the systems development process, particularly if it is not resolved (Green, 1989; Roby *et al.*, 1989, 1993; Kendall and Kendall, 1995; McKeen *et al.*, 1994; Newman and Robey, 1992; Robey and Farrow, 1982; Ponemon and Nagoda, 1990; Markus, 1983). More specifically, confirmation of H3 suggests that, in a system-related failure outcome, users will be seeking information to confirm that external factors caused the failure; simultaneously, analysts will be seeking information to confirm that internal factors (ability and or effort of users) caused the failure. Organizational resources in terms of both incremental search costs and opportunity costs will be wasted to the extent that information-seeking strategies are driven by attributional biases, as opposed to a logical examination of the cause of the failure. Confirmation of H4 will simply document the conflict generated between users and developers as a result of the disparate attributions, and H5 follows with the negative system satisfaction implications associated with conflict. User dissatisfaction with a system is likely to result in underutilization of a currently effective system or resistance to participate in the redesign of a potentially effective system.

Ultimately, the best way to deal with the dysfunctional consequences of attributional biases is to mitigate them. Research literature contains exhortations for training programs to increase the awareness of individuals of the tendencies to fall prey to these biases (Levi, 1987; Bernardin, 1989; Morrow and Deidan, 1992; Fadil, 1995). One approach, directly related to systems development, is the effective use of user participation in the systems development process. In support of this proposition, Robey *et al.* (1989) found that user participation directly positively affects user influence and indirectly (through its impact on influence) affects both conflict and conflict resolution.

5. USER PARTICIPATION

While user participation (UP) and user involvement constructs have undergone much discussion and definition in the IS literature, Barki and Hartwick (1989) argue for a distinction between the two. These authors maintain that user participation should be used in place of user involvement when referring to the set of activities that users perform in the systems development process. They present user involvement as a subjective, psychological state wherein the user considers the system to be both important and personally relevant. Accordingly, the term user participation is used here to refer to "the behaviors or activities that users or their representatives perform in the systems development process."

Swanson (1974) proposed that UP is essential, as it instills an appreciation and understanding of the system. Subsequent studies have substantiated this proposition. Edstrom (1977) concluded that while user influence was related to system success, the value of user influence is less in a structured environment than in an unstructured environment. Presumably, the need to understand better the unstructured and undocumented environment by the developer enhances the value of user influence. DeBrabander and Edstrom (1977) conceptualize UP as an interaction process between users and developers. They argue that each group brings a different conceptual framework to the development process and that effective communication leads to mutual understanding. Franz and Robey (1986) concluded that UP leads to increased understanding of how a system works, how the information output fits the organization, and how information assists in problem solving and to reduced uncertainty regarding information requirements. In their review, Ives and Olson (1984) identify the following reasons for the value of UP: increased understanding of the system, better needs assessment, and improved evaluation of system features. In an effort to determine empirically the utility of UP, Baronas and Louis (1988) argued that implementation represents a threat to users' sense of control and found that UP is effective because it restores or enhances users' perceived control.

Interestingly, Robey and Farrow (1982) found UP to be directly and indirectly (through user influence) associated with increased conflict across all stages of systems development (initiation, design, and implementation phases): this despite the two key variables omitted from the study: systems development success criterion and a more detailed description of the mechanisms of UP. Further, attribution theory provides a theoretical framework describing how these mechanisms of UP, in conjunction with the success/failure nature of the system-related outcomes, may impact conflict.

Relating the above discussion to the attributional process, it is hypothesized that users who have effectively participated in the systems development process have both an increased understanding and a heightened feeling of ownership of the resulting system. Thus, if these users experience a system-related failure outcome, they will be less prone to the self-serving patterns of attribution and more thoughtfully consider the possibility of both internal and external causes.

Developers who have been involved in a systems development project where users have effectively participated are more likely to perceive these users as having an increased understanding of the system and a heightened sense of ownership. Consequently, if these users experience a system-related failure outcome, the developer will be less prone to the fundamental attribution error pattern of biased attributions and more thoughtfully consider the possibility of both external as well as internal causes. Accordingly, the following hypotheses, incorporating the UP construct, are proposed for the more salient, system-related failure outcome.

H6a: Compared to nonparticipating users, the causal attributions of participating users for system-related failure outcomes they experience will be less external.

H6b: Compared to developers involved with nonparticipating users, the causal attributions of developers involved with participating users for system-related failure outcomes experienced by users will be less internal.

Ultimately, the above hypotheses suggest that effective user participation is likely to mitigate the two attributional biases, thus making attributions for system-related outcomes more accurate for both users and developers. These more accurate and convergent attributions would, arguably, lead to an avoidance of the negative consequences likely to be associated with biased and disparate attributions.

Figure 1 diagrammatically presents the collective grouping of H1–H6. It highlights the hypothesized relationships among outcomes and attribution differences (H1a/b and H2a/b) and notes the influence of UP, relevant to this study, on

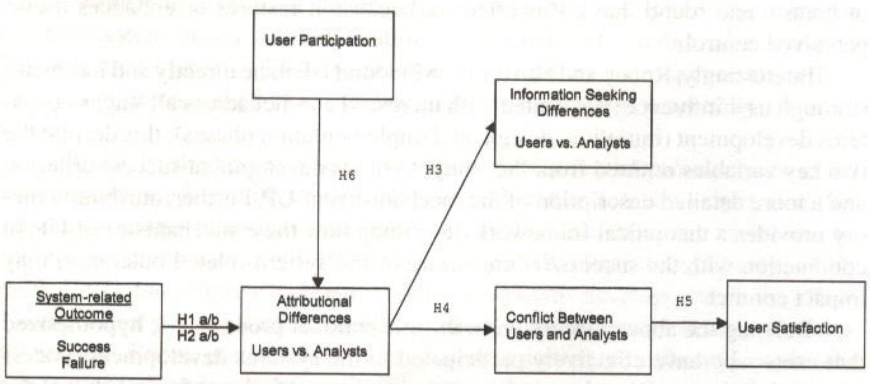

Fig. 1. The relationships among outcomes and attribution differences and the influence of user participation.

attributional differences between users and developers (H6). While UP has been shown to have an impact throughout the entire systems development process (Robey and Farrow, 1982), its influence on postimplementation system-related outcomes is most salient for this study. Additionally, Fig. 1 presents the hypothesized consequences of attributional differences in key areas related to systems development: information seeking, conflict, and user satisfaction (H3–H5).

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