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CLEANING UP THE BIG MUDDY: A META-ANALYTIC REVIEW OF THE DETERMINANTS OF ESCALATION OF COMMITMENT

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The topic of escalation of commitment has intrigued the organizational sciences for over 35 years. A variety of theoretical explanations have been offered for why escalation occurs, and numerous constructs have been examined as antecedents of escalation behavior. However, little effort has been made to systematically investigate these various accounts. Using meta-analysis, we present a comprehensive overview of the many determinants found in the literature, an analysis of the power of different theoretical perspectives, and an examination of the relative efficacy of the various theories. Drawing on our findings, we offer advice to managers and guidance for future research directions.

One of the most robust and costly decision errors addressed in the organizational sciences has been the proclivity for decision makers to maintain commitment to losing courses of action, even in the face of quite negative news (Brockner, 1992; Staw, 1997). For over 35 years, management researchers have had an enduring interest in this topic, known as escalation of commitment (Staw, 1976). In addition, scholars in related fields, such as finance (e.g., Schulz & Cheng, 2002), marketing (e.g., Schmidt & Calantone, 2002), accounting (e.g., Jeffrey, 1992), and information systems (e.g., Heng, Tan & Wei, 2003), as well as those in other social science disciplines, such as social psychology (e.g., Zhang & Baumeister, 2006) and economics (e.g., Berg, Dickhaut, & Kanodia, 2009), have examined this behavioral pattern of “throwing good money (or resources more generally) after bad.”

Escalation has been noted as a prominent feature of a variety of controversial or outright failed organizational decisions. Examples include the financially mismanaged highway construction project in Boston known as the Big Dig (Dahl, 2001), the badly administered development of the Shoreham Nuclear Power Plant in New York (Ross & Staw, 1993), the rogue trades of Nick Leeson involving Barings Bank (Jensen, Conlon, Humphrey, & Moon,

2011), the failed “Taurus” information technology project for the London Stock Exchange (Drummond, 1996), and various military campaigns (e.g., Staw, 1976; the title of Staw’s article borrows from the 1967 Pete Seeger Vietnam War protest song, “Waist Deep in the Big Muddy”). Recent United States government assistance to the financial services firm AIG has some of the hallmarks of escalation: an initial commitment of \$85 billion in support grew to \$172 billion as new problems arose, even though the assessment of the Government Accountability Office (GAO, 2009) indicated great uncertainty as to whether AIG would be able to repay the government.

Numerous explanations for why people engage in escalation behavior have been offered; some of the more common include a sense of personal responsibility for the initial decision that led to the failing course of action (Staw, 1976), the extent of sunk costs (Arkes & Blumer, 1985; Thaler, 1980), and the extent to which the failing project is near completion (Conlon & Garland, 1993). A number of other antecedents have also been investigated over the years, such as performance trend data (e.g., Brockner et al., 1986), decision maker personality (e.g., Wong, Yik, & Kwong, 2006), and decision maker experience (e.g., Jeffrey, 1992). Early work, which was primarily laboratory-based (e.g., Brockner et al., 1982; Staw, 1976) has been supplemented with archival and field-based research (e.g., Astebro, Jeffrey, & Adomdza, 2007; McNamara,

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Moon, & Bromiley, 2002). Thus, although researchers' understanding of the phenomenon has grown, the variety of determinants and contexts that have been studied presents a need for the escalation literature to be effectively summarized. This lack of integrative synopsis is not a new problem for the escalation literature. In fact, Staw and Ross noted over 20 years ago that "as the volume of escalation studies has grown in recent years, attempts to summarize and integrate this literature . . . have become increasingly difficult" (1987: 41).

Along with the proliferation of variables that have been examined as precursors to escalation, a number of interesting theoretical questions have not been fully addressed. These include, but are not limited to, the following:

Is being personally responsible for the initiation of a project a necessary prerequisite for escalation to occur?

To what extent do sunk cost and project completion effects each independently drive escalation behavior?

Does the presence of opportunity cost information attenuate or exacerbate the tendency to escalate?

Does it matter whether decision authority is shared or unshared?

Interestingly, Staw and Ross considered conducting a quantitative review of the determinants of escalation; however, at the time, they felt that the field was "a long way from being able to conduct such meta-analyses, not only because the empirical studies have been so few, but because most of the studies have been rather unique conceptually" (1987: 65). We believe the literature on escalation of commitment has now reached a level of theoretical complexity and intellectual maturity at which a comprehensive review is possible. Thus, our goal is to present a meta-analytic review, relying on prior work to provide an organizing model to classify the many variables and theoretical perspectives that have been investigated.

Our study offers three primary contributions to the escalation of commitment literature. First, by quantitatively summarizing the body of escalation research over the last 35 years, we are able to aggregate the findings of many individual studies to present a comprehensive overview of the various antecedents found in the literature. As several of the studies on escalation have been conducted with relatively small samples, the results from individual studies may be idiosyncratic to the sample examined. A meta-analysis allows us to overcome this limitation and identify robust effects. Second, a number of different theories of escalation have been proposed over the years, and we provide an

analysis of the power of these theoretical perspectives to explain escalation. Third, our study investigates the relative efficacy of these different theoretical perspectives by developing and testing theoretical arguments related to factors that moderate the relationships between antecedents of escalation and escalation behavior. This allows us to offer insights into when and how particular theories are more predictive of escalation than others.

CONCEPTUAL FRAMEWORK FOR CATEGORIZING THE DETERMINANTS OF ESCALATION

Staw and Ross (1987) assessed the state of escalation research and developed an insightful taxonomy for the factors that influence escalation behavior. Their model of the escalation cycle articulated four sets of determinants that are useful in categorizing the host of variables that have been studied. Although their model was meant to be descriptive rather than theoretical, we note that many of the central theories underlying research on escalation can be logically positioned within their model. We feel that incorporating these theoretical perspectives into the Staw and Ross (1987) framework can be useful as a means of synthesis and insight into theory building (cf. Doty & Glick, 1994). Thus, as we present the framework, we will also discuss the relevant theoretical perspective(s) underlying the empirical studies in each category. Specifically, we consider subjective expected utility theory (e.g., Savage, 1954), self-justification theory (e.g., Aronson, 1968; Festinger, 1957), prospect theory (e.g., Kahneman & Tversky, 1979), the goal substitution effect (e.g., Conlon & Garland, 1993), self-presentation theory (e.g., Goffman, 1959; Jones & Pittman, 1982), and agency theory (e.g., Eisenhardt, 1989; Jensen & Meckling, 1976). As can be seen in Table 1, we classified 19 different antecedent measures into 16 conceptual constructs and stated the hypothesized relationship each has with escalation, in addition to highlighting the relevant theoretical perspective for each relationship.

The first set of antecedents, *project determinants*, was characterized by Staw and Ross (1987) as objective features of decisions that often relate to why a course of action was begun in the first place. The broad theoretical driver of most empirical studies in this category is subjective expected utility theory. According to this perspective, individuals make escalation decisions by considering the potential outcomes that may arise from escalating versus de-escalating (e.g., recouping a loss or losing even more resources) as well as the likelihood that each outcome will occur. Individuals will choose

TABLE 1
Determinants of Escalation of Commitment: Main Effect Predictions

Determinants of Escalation	Hypothesized Relationship	Theoretical Reasoning
Project Determinants		
H1. Decision risk	Negative	<i>Subjective expected utility theory:</i> Risk increases the likelihood of loss (Knight, 1921) and the salience of loss potential to decision makers (Kahneman & Tversky, 1979; March & Shapira, 1987), lessening the likelihood of escalation even in the face of information on previous performance (Schaubroeck & Davis, 1994).
H2. Opportunity cost information	Negative	<i>Subjective expected utility theory:</i> Opportunity cost information provides a clear decision benchmark and allows decision makers to consider alternatives in their calculation of whether or not to escalate (Northcraft & Neale, 1986).
H3. <i>Information set</i>		
a. Information acquisition	Negative	<i>Subjective expected utility theory:</i> (a) Providing information about a decision reduces ambiguity, which can reinforce the poor prospects for the decision (Bowen, 1987; Bragger, Hantula, Bragger, Kirnan, & Kutcher, 2003). (b) Uncertain information on decision prospects allows decision makers to focus on positive indicators (Bragger, Bragger, Hantula, & Kirnan, 1998).
b. Decision uncertainty	Positive	
H4. Positive performance trend information	Positive	<i>Subjective expected utility theory:</i> Positive trends allow decision makers to focus on the potential positive outcomes of the situation and discount worst-case scenarios (Moon & Conlon, 2002); thus, decision makers expect greater utility in such circumstances.
H5. Expressed preference for initial decision	Positive	<i>Subjective expected utility theory:</i> Decision makers may escalate simply because they value, and hence have a strong preference for, the given course of action (Schulz-Hardt et al., 2009).
Psychological Determinants		
H6. <i>Previous resource expenditures:</i>		
a. Sunk costs	Positive	<i>Self-justification theory:</i> (a) Sunk costs trigger self-justification pressures, as decision makers do not want to be seen as wasting organizational resources (Arkes & Blumer, 1985). (b) Time investment entraps decision makers, as they do not want to admit their time investment has been a waste; although such investments may sometimes need to be put in monetary terms to make them salient (Soman, 2001).
b. Time investment	Positive	
H7. <i>Familiarity with decision context:</i>		
a. Experience/expertise	Positive	<i>Self-justification theory:</i> (a) Experience or expertise in a given domain may affect how decision makers react to negative feedback and engage in pressures to justify the decision to continue a course of action (Bragger et al., 2003; Garland et al., 1990). (b) Self-efficacy or confidence increases decision persistence, as individuals high in positive self-concept discount negative information and believe they can overcome the negative aspects of a situation (Judge et al., 1998).
b. Self-efficacy/confidence	Positive	
H8. Personal responsibility for initial decision	Positive	<i>Self-justification theory:</i> Felt responsibility enhances the threat associated with decision failure and activates self-justification needs (Staw, 1976). Moreover, felt responsibility may trigger self-justification pressures in order to protect one's self-identity (Brockner et al., 1986).
H9. Ego threat	Positive	<i>Self-justification theory:</i> Ego threat heightens concerns about the reputation of an individual and activates self-justification needs (Zhang & Baumeister, 2006).
H10. Anticipated regret	Negative	<i>Self-justification theory:</i> Decision makers avoid situations in which they anticipate negative emotions, so anticipated regret derived from continuing a failed project likely reduces pressures to justify continuance (Ku, 2008; Wong & Kwong, 2007).
H11. Information framing ("negative" = 0, "positive" = 1)	Negative	<i>Prospect theory:</i> When objectively negative situations are framed in a positive manner, people become more risk-averse and are consequently less likely to escalate (Schoorman, Mayer, Douglas, & Hetrick, 1994).
H12. Proximity to project completion	Positive	<i>Goal substitution effect:</i> As decision makers approach completion, they substitute a completion goal for their original project success goals (Conlon & Garland, 1993).
Social Determinants		
H13. Public evaluation of decision	Positive	<i>Self-presentation theory:</i> Decision makers facing outside evaluation are more likely to escalate in order to manage the impressions others have of them and "save face" (Brockner et al., 1981).
H14. Resistance to decision from others	Negative	<i>Self-presentation theory:</i> Challenges from others increases accountability and evaluation, and thus resistance attenuates pressure to escalate commitment (Fox & Staw, 1979).
H15. Group identity or cohesiveness strength	Positive	<i>Self-presentation theory:</i> Individuals identifying with cohesive groups are likely to experience conformity of perception and judgment (Hogg & Terry, 2000; Janis, 1972). Hence, as individuals acting alone tend to exhibit an escalation bias, the same tendency is especially likely to occur (cf. Myers & Lamm, 1976) in the presence of a cohesive group.
Structural Determinants		
H16. Agency problems	Positive	<i>Agency theory:</i> When agency problems exist, decision makers may act in a self-interested way and escalate at the expense of their organization (Booth & Schulz, 2004).

to escalate or de-escalate depending on which is most likely to yield the highest expected utility. Thus, it is not surprising that many of the studies in this category focus on economic or financial information related to venture initiation (e.g., real options), continuation (e.g., profitability estimates, size of budget, and opportunity cost information), or termination (e.g., closing costs or salvage value should a project be discontinued).

In our review, six project determinant variables appeared with sufficient regularity in the literature (e.g., in at least three independent data sets) for us to examine them meta-analytically. We placed these variables into five conceptual groups (see Table 1, Hypotheses 1–5). Some of these (decision risk, opportunity cost information, and information acquisition) were expected to reduce escalation behavior, and others (decision uncertainty, positive performance trend information—e.g., the presence of an increasing, but still low, probability of success—and an expressed preference for the initial decision) were expected to have a positive relationship with escalation. Numerous project determinants identified by Staw and Ross (1987) have not appeared in enough studies to be included in the meta-analysis, including the degree to which a current setback is temporary and the time horizon or size of investments and payoffs.

The second category, labeled *psychological determinants*, recognizes that decision makers engage in cognitive and affective processing of information that often leads them to redouble their commitment to failing projects, rather than de-escalate. Psychological determinants represent the most frequently studied determinant category in the literature. In contrast to the single theoretical perspective that served as a substrate for project determinants, three core theoretical perspectives underlie the determinants in this category: self-justification theory, prospect theory, and the goal substitution effect. According to self-justification theory, decision makers who were responsible for an initial course of action that is subsequently failing experience a need to justify the original decision and thus escalate in the hope of a turnaround. Prospect theory focuses on whether information related to a decision is framed in a gain or a loss context, with loss-framed decisions (which include escalation decisions) leading to loss aversion, and thus risk-seeking behavior (in this case, further expenditures).¹ The goal substitution effect argument is that

as projects move toward completion, the goal of completing them becomes increasingly important and takes precedence over original goals such as economic profitability. This perspective is distinct from self-justification and prospect theory, as the motivation to escalate is neither to justify past decisions nor to avoid losses.

Nine variables in the psychological determinants category appeared with sufficient regularity to be examined meta-analytically. We placed these variables into seven conceptual groups (Table 1, Hypotheses 6–12) and posited that almost all of them (i.e., greater levels of previous resource expenditures, familiarity with the decision context, personal responsibility for the initial decision, ego threat, and proximity to project completion) will have positive relationships with escalation behavior. Only anticipated regret and positive information framing were expected to have negative relationships. In addition, we note that although Staw and Ross (1987) considered some of these psychological determinants and theoretical perspectives (for instance, information framing and self-justification), others have appeared more recently in the escalation literature, including project completion information, expertise, and affective processes.

The above theories underlying psychological determinants have been shown to be both plentiful and powerful in predicting escalation, yet they fail to address another fundamental driver of behavior in organizations: the involvement of other parties as evaluators, commentators, rivals, or even merely observers of decisions. The third category proposed by Staw and Ross (1987), *social determinants*, reflects the influence these others have on furthering commitment to decisions even when decision makers may know it is unwise. The theoretical perspective that embodies this category is self-presentation theory, which has been influential in the management literature (e.g., Grant & Mayer, 2009; Westphal & Graebner, 2010). According to this theory, people are motivated to strategically manage the impressions others have of them; in escalation situations, this leads to individuals having paramount concerns that they avoid any public embarrassment in being linked to a failed project and that their impression management behaviors lead others to view them as competent decision makers.

We identified three conceptual groups as part of this category (Table 1, Hypotheses 13–15). Two of these were expected to facilitate escalation (public

¹ Researchers have recently questioned how prospect theory has been characterized in management research (Bromiley, 2010). Various propositions attributed to the

theory are perhaps better exemplified by the behavioral theory of the firm (Cyert & March, 1963); however, such a debate is outside the scope of our review.

evaluation of a decision and group identity or cohesiveness strength), and one (resistance to the decision from others) was expected to reduce escalation. There has not been much research on how other social determinants might affect escalation behavior. For instance, organizational culture, myths, stories, and informal reward systems are likely to have a significant influence, but there has not been enough research to date to quantitatively summarize their influence.

The final category, labeled *structural determinants*, defined by Staw and Ross as “the structural features of an organization and its interaction patterns” (1987: 60), includes organizational elements that may stem from a focal course of action (e.g., other decisions made in support of an original course of action) or contextual features of organizations in which escalation dilemmas are considered (e.g., administrative inertia). A theoretical perspective underlying much of the work represented in this category is agency theory, whereby managers may escalate projects because their incentives diverge from the interests of their organization. For instance, managerial incentives may be structured in such a way that commitment escalation has only an upside, with no associated downside, for the managers.

Unfortunately, of the four categories in the Staw and Ross (1987) model, the least studied has been structural determinants. In fact, the only determinant in this category for which we were able to find enough studies to include in the meta-analysis was the presence of agency problems, which we expected to have a positive relationship with escalation (Hypothesis 16). Little to no research to date has examined factors such as whether and how escalation is a consequence of overall organizational performance, the presence of political action in support of a course of action, and the degree to which a project has been institutionalized in its organization. This scarcity may in part be due to the difficulty of studying such factors. For instance, collecting data on the political support for a project can present a researcher with difficulties such as demand characteristics (i.e., response bias) and divergent opinions among organization members. Moreover, many of these factors can be less easily recreated in laboratory settings than can some of the other determinants.

To summarize, Table 1 reviews the main effect relationships suggested by prior research (Hypotheses 1–16) and the different theoretical perspectives scholars have typically relied on in developing these relationships. We will refrain from presenting detailed rationales for each main effect hypothesis, as our goal is to present a broad over-

view of the determinants in addition to evaluating the power of the different theoretical perspectives. The table clearly illustrates the uneven level of inquiry across the four categories. The body of research on project and psychological determinants of escalation is substantial, but many open questions remain regarding the extent to which social and (especially) structural determinants affect escalation behavior.²

RESOLVING SOME THEORETICAL QUESTIONS IN THE ESCALATION LITERATURE

Although we believe that examining the main effect drivers of escalation is important because it offers an overview of variables in the literature and provides insight into the power of different theoretical perspectives, we also think it is even more important to examine moderating effects of some of the more well studied determinants of escalation. This will allow us to uncover the relative efficacy of the various theories and ultimately develop a more nuanced theoretical understanding of the escalation phenomenon. To this end, we focus on three drivers of escalation: responsibility for the initial decision to begin a subsequently failing course of action, sunk costs, and proximity to project completion. We concentrate on these determinants because they are the best known and most studied, and consequently are the antecedents in greatest need of refined understanding with a sufficient number of studies amenable to moderator analyses.

Volition in the Initial Decision

The most frequently investigated determinant of escalation is personal responsibility for the initial decision that has led to a failing course of action (Staw, 1976). The theory most often drawn on to

² Although most of the antecedents were easily classified into one of the four categories, we acknowledge that a few could be classified into more than one. For example, personal responsibility for an initial decision could be viewed as a project determinant (in the sense that it might be an objective feature of the task), but it is also a psychological determinant when, at a later point in the escalation process, a decision maker recalls that he or she was responsible for making the initial decision and subsequently may feel pressure to continue the course of action. As our interest was not in definitively classifying the many determinants but rather in developing an organizing heuristic upon which to draw when considering them, this classification ambiguity does not present a significant problem for the present work.

support personal responsibility's role is self-justification theory, which suggests that felt responsibility engenders a need to justify past expenditures. Given the large number of studies that have shown support for the responsibility effect, some practical advice scholars have offered to managers to combat escalation bias has been to shift escalation decisions to someone other than the initial decision maker so that the new individual is not so "attached" to the previously made decision (i.e., the decision process is bifurcated).

The responsibility effect has been well-documented in the literature, yet Schulz-Hardt, Thuro-Kröning, and Frey (2009) recently called its validity in explaining escalation into question, suggesting that much of the empirical evidence for the effect actually supports another perspective, namely, that decision makers escalate because of their *preference* for the initial decision. They suggest that traditional mechanisms for the responsibility effect (e.g., self-justification) are misguided and what has instead been driving the effect of responsibility on escalation is merely a simple preference for the chosen alternative. In essence, this argument is rooted in the utility-based view of escalation. Schulz-Hardt et al. argued that in studies purporting to show a responsibility effect, the "responsible" experimental conditions contain mostly individuals who truly prefer the chosen course of action, whereas the "not responsible" conditions contain a more diverse mixture of individuals who either prefer, do not prefer, or have no preference regarding the course of action. Schulz-Hardt et al. (2009) conducted two experiments in which they measured and manipulated preference for a chosen course of action, finding that preference was the actual driver of escalation, as opposed to the assignment of responsibility, thus supporting their view of "preference-based" escalation.

This research appears to challenge the self-justification approach to escalation in favor of an approach more in line with subjective expected utility. We have an opportunity in our meta-analysis to categorize studies that investigated the responsibility effect into those in which decision makers were merely *told* they had made the initial funding decision (e.g., Bazerman, Giuliano, & Appelman, 1984; Tosi, Katz, & Gomez-Mejia, 1997; Wong & Kwong, 2007) and those in which individuals had *actually made* the decision (e.g., Bazerman, Beekun, & Schoorman, 1982; Brody & Frank, 2002; Haunschild, Davis-Blake, & Fichman, 1994). The preference effect argument (Schulz-Hardt et al., 2009) would suggest that being assigned responsibility for a failed course of action creates a condition that includes both people who support and do

not support the decision. By contrast, explicitly choosing the failed course of action creates a condition that comprises only decision makers who have an actual preference for the course of action. As such, our moderator analysis presents a more stringent test of the preference effect and allows us to examine, across a number of studies, whether "responsibility has no effect over and above this effect of preferences" (Schulz-Hardt et al., 2009: 175). In keeping with this perspective, we predict that escalation behavior will be more pronounced in studies in which decision makers actually made the initial decisions, as compared to merely being told they had made them.

Hypothesis 17. Responsibility for a decision to initiate a subsequently failing course of action results in higher levels of escalation when the initial decision was explicitly chosen rather than assigned.

Covariation of Sunk Cost and Project Completion Effects

One of the most discussed and examined drivers of escalation of commitment is the sunk cost effect (Arkes & Blumer, 1985; Thaler, 1980). Sunk costs refer to resources already expended in pursuit of a given course of action. According to traditional economic theory, only incremental costs and benefits (including opportunity costs) should factor into rational decision making; sunk costs simply should not be a consideration. However, Arkes and Blumer (1985) presented evidence from a series of experiments suggesting that decision makers tend to prefer a given decision alternative over another if it has incurred greater sunk costs. Numerous follow-up studies have supported the prevalence of the sunk cost effect (e.g., Garland, 1990; Garland & Newport, 1991). As with the aforementioned responsibility effect, the theoretical mechanism most often used to explain the sunk cost effect is self-justification theory, whereby decision makers who have expended significant resources on a failing course of action want to justify these expenditures by escalating commitment, in hope of a turnaround.

Although we acknowledge that many studies appear to reveal a strong sunk cost effect (consistently with our main effect Hypothesis 6a), some researchers have posited that empirical evidence in support of the effect has confounded sunk costs with additional information available to decision makers. In particular, many of the studies supporting the sunk cost effect have included (and covaried) project completion information. For example,

when participants were told that sunk costs were low (e.g., that 1 million of a 10 million dollar budget had already been spent), they were also told that the project had just begun (e.g., was 10 percent complete). Conversely, when participants were told that sunk costs were high (e.g., 9 million of a 10 million dollar budget had been spent), they were also given an indication that the project was near completion (e.g., 90%). In such studies, project completion information was typically not included as an independent variable; instead, all effects were attributed to sunk costs.

Conlon and Garland (1993) argued that in both real-world and laboratory settings, commitment escalation decisions are frequently made in light of both increased sunk costs and proximity to project completion. Their goal substitution explanation, based on earlier work on goal motivation and effort (Hull, 1932; Lewin, 1935), is that as managers progress on a given project, it appears to take on "a life of its own," and its completion becomes a goal priority that can even supersede the original goals of the project. As many empirical studies have revealed support for the goal substitution effect (Boehne & Paese, 2000; Garland & Conlon, 1998; Moon, 2001), its validity has been well established. However, our meta-analysis allows us to disentangle the sunk cost and project completion effects over a number of different studies. As both the self-justification and goal substitution perspectives have been found to be valid predictors of escalation, we expect that the sunk cost effect will be much stronger in decision settings in which sunk cost and project completion are explicitly covaried, as the highly salient project completion information will reinforce the sunk cost effects. By contrast, we expect to find weaker sunk cost effects in settings in which sunk costs and completion are independently varied, because decision makers may be faced with potentially conflicting information in some cases (e.g., that 9 million of a 10 million dollar budget has been spent and the project is only 10 percent complete).³

Hypothesis 18. The degree to which sunk costs influence decision escalation is higher when sunk costs and project completion are explic-

itly covaried as compared to when they are not explicitly covaried.

Influence of Opportunity Cost Information

We now turn to the influence of opportunity cost information. Note that we predicted that opportunity cost salience will have a negative main effect on escalation tendencies (Hypothesis 2). This is consistent with the subjective expected utility view of escalation whereby opportunity cost information likely engenders a relatively *lower* expected utility for a failing course of action and a relatively *higher* expected utility for the alternative course(s) of action. Indeed, it makes intuitive sense that if decision makers are aware of alternative investments, they would be more likely to consider these alternatives in their escalation calculus. With the intent of combating the escalation bias, researchers have suggested that organizations make alternative courses of action salient. Such practical advice for managers has been given for quite some time (e.g., Keil, Truex, & Mixon, 1995; Northcraft & Neale, 1986); however, we believe that this recommendation should perhaps be qualified and that the relationship between the salience of opportunity costs and escalation behavior is more complex than previous research has suggested. Below, we argue that this utility-based rationale for the influence of opportunity costs can perhaps be more fully understood in light of the theories we covered above in the psychological determinants category of escalation drivers. More specifically, we believe that the salience of opportunity cost information will moderate the relationships between well-documented antecedents of escalation (i.e., the responsibility, sunk cost, and project completion effects) and escalation behavior.

Managers desire to be seen as effective stewards of organizational resources (Davis, Schoorman, & Donaldson, 1997). As such, they tend to escalate when faced with negative feedback about a course of action, especially one for which they feel a great deal of responsibility (Staw, 1976). Moreover, they also tend to escalate if they have invested significant resources in the failing course of action (Arkes & Blumer, 1985). Decision makers in these situations are sometimes keenly aware of viable decision alternatives (perhaps at the behest of senior management trying to assuage the tendency for escalation); however, we believe such opportunity cost information may have unintended consequences in the face of high felt responsibility or high sunk costs. In particular, a decision maker may actually be even *more* likely to escalate because the opportunity cost information more

³ We would like to have explored the influence of sunk costs and project completion covariation on the relationship between project completion and escalation; however, we could only locate two project completion data sets with such covariation, both of which were from the same study (experiments 1 and 2 of Garland and Newport [1991]).

clearly highlights the potential cost to the organization of the failed course of action. For example, if a project initiated by a manager has received 9 million dollars of investment to date out of a 10 million dollar budget and has an expected value of only 8 million dollars after completion, the manager knows that he or she will have to admit to "wasting" 2 million dollars of organizational resources. However, if the manager also knows that the organization has other investment options that would offer returns of 15 percent, the decision maker has to factor in another 1.35 million dollars for the lost opportunity related to the 9 million the firm has already invested in the project. According to the self-justification perspective on escalation, an individual in this circumstance might experience a strong need to escalate to justify both the previous investment and the forgone alternatives. Thus, we predict that the salience of opportunity costs will positively moderate the relationships between (1) degree of felt responsibility and escalation and (2) degree of sunk costs and escalation.

Opportunity cost salience may also influence responses to project completion information. According to the goal substitution perspective on escalation, as failing projects approach completion, managers switch from focusing on a goal they can likely no longer obtain (e.g., economic profitability) to one for which they can perceive success (project completion). Hence, escalation tends to occur the closer projects are to being finished. Moreover, the degree to which managers experience loss (e.g., after receiving negative feedback) is likely to increase the extent to which they substitute the completion goal for the original goals of the projects. We anticipate that the awareness of opportunity costs associated with a failing project further increases this perceived loss, thus accentuating the degree to which managers use project completion as their most salient and valid goal. This is because decision makers prefer to focus on goals that are achievable rather than unattainable (Katz & Kahn, 1966).

In sum, the escalation effects derived from self-justification theory and the goal substitution effect are expected to be even more pronounced in the face of opportunity cost information.

Hypothesis 19a. Salience of the opportunity costs associated with continuing a failing course of action positively moderates the degree to which responsibility for the initial decision influences decision escalation.

Hypothesis 19b. Salience of the opportunity costs associated with continuing a failing course of action positively moderates the de-

gree to which sunk costs influence decision escalation.

Hypothesis 19c. Salience of the opportunity costs associated with continuing a failing course of action positively moderates the degree to which proximity to project completion influences decision escalation.

Shared Responsibility Effects

Escalation decisions in organizations are sometimes "shared" in the sense that others besides focal decision maker(s) review the choice made. Our final theoretical puzzle concerns the extent to which social influence processes impact the proclivity for responsibility to trigger escalation. As noted earlier, according to self-presentation theory, individuals are inclined to strategically manage the impressions others have of them. Thus, when faced with an escalation dilemma in the presence or awareness of others, managers responsible for a failed course of action are likely to experience social pressures to escalate commitment; otherwise their peers may perceive them as incompetent decision makers. This impression management influence may impact the way decision makers process information when deciding whether or not to escalate. For instance, research on accountability and decision making suggests that decision oversight from others can prompt individuals to become defensive and reduce their cognitive activity (Tetlock, 1992), and thus social processes can clearly have an impact on decision quality. As an illustration of this in an escalation context, McNamara et al. (2002) found that bank loan officers escalated their commitment to poorly performing loans if their organization instituted changes to increase loan monitoring.

In keeping with this theory and research, we expect sharing of decision authority to have a positive, moderating effect on the relationship between responsibility for an initial decision and escalation behavior. Recall that though we predicted that felt responsibility would trigger escalation (via self-justification theory; see Hypothesis 8), we also predicted that the public evaluation of the escalation decision would also increase the likelihood of escalation (via self-presentation theory; see Hypothesis 13). Our meta-analysis allows us to go beyond these main effects to test whether social processes might explain incremental variance above and beyond that explained by self-justification theory.

Hypothesis 20. The degree to which responsibility for an initial decision to initiate a subsequently failing course of action influences de-

cision escalation is higher when decision authority is shared.

METHODS

Literature Search

We searched for any scholarly journal articles that had combinations of the keywords *escalation*, *commitment*, *de-escalation*, *sunk cost*, *project completion*, *completion bias*, *incremental investment*, and *entrapment*, as well as their plural forms and alternate spellings. We gathered these articles from three different databases (ABI Inform, PsycInfo, and ISI Web of Science) during the spring of 2009. No starting date was used for the searches; however, no articles before 1975 were found to be relevant. In addition, we performed a citation search of influential articles (Arkes & Blumer, 1985; Brockner, Rubin, & Lang, 1981; Conlon & Garland, 1993; Staw, 1976) to find any studies excluded in previous searches. Our initial list included 917 articles.

Inclusion Criteria

After gathering this list of articles, we examined each for relevance to the escalation of commitment phenomenon, removing many unrelated to the topic of interest (e.g., articles related to organizational commitment or escalation of conflict), as well as articles not conforming to the traditional definition of escalation (Staw, 1976). In particular, we only included studies that involved decision maker(s) continuing a *failing* course of action. We emphasize the negative feedback (i.e., failing) that must occur; otherwise the instance is not consistent with the conventional definition of an escalation situation (Staw, 1976). This is important, because it excludes related constructs such as strategic momentum (e.g., Amburgey & Miner, 1992), traditional sunk cost effects with no negative feedback (Roodhooft & Warlop, 1999), entrapment with no negative feedback (e.g., Brockner et al., 1981), commitment to the status quo (e.g., Hambrick, Geletkanycz, & Fredrickson, 1993), sequential decision making (e.g., Hantula & Crowell, 1994), behavior fluidity (e.g., Humphrey, Moon, Conlon, & Hofmann, 2004), perceived control over a failing project (e.g., Jani, 2008), inaction inertia (e.g., Kumar, 2004), the endowed progress effect (e.g., Nunes & Dreze, 2006), and consumer “lock-in” (e.g., Zauberaman, 2003). Additionally, some studies included nonhuman samples (starlings in Kacelnik and Marsh [2002]; pigeons in Navarro and Fantino [2005]), which we migrated out of the data set. We

also excluded any studies that did not include data capable of conversion to effect sizes or did not include any data at all (e.g., Noda & Bower, 1996; Ross & Staw, 1986). Although our extensive searches in online and paper sources allowed us to gain access to almost all of the articles identified in our initial database searches, we were unable to find full versions of ten of these articles. All of them were published in non-U.S. journals that are not widely held in university libraries and were not included in full text form in electronic databases. After using these inclusion criteria, we retained a set of 166 independent samples for the meta-analysis.

An important consideration in any meta-analysis is the selection of studies and contexts to be included for analysis (Geyskens, Krishnan, Steenkamp, & Cunha, 2009; Wanous, Sullivan, & Malinak, 1989). Our meta-analysis strove to be comprehensive: We included studies beyond the boundaries of the management literature, including both laboratory and nonlaboratory samples in addition to studies that included students and practicing managers, as research on escalation has been diverse. Such inclusiveness can sometimes act as a double-edged sword in meta-analyses, as different empirical contexts may represent fundamentally different approaches to the construct of interest. In addition to addressing this concern by only including studies that conceptualized escalation according to Staw's (1976) traditional definition, we also approached this concern empirically by coding important study characteristics for each sample to warrant aggregation. We treated these study features as moderators between the relationships of escalation and particular antecedents; we used responsibility, sunk costs, and project completion, as these were the most frequently investigated antecedents and hence the most likely to reveal any moderating effects in subgroup analyses.

Coding

At the onset of our coding, we coded a set of articles together to establish coding rules and set decision-making norms. A second set of articles was then coded independently; we then again met as a group to compare codings and make changes to the coding rules. A third set of articles was then coded independently, after which we met in pairs to compare coding and further refine coding rules. In this way, the first 38 articles were coded and agreed upon. Afterwards, we separately coded the remaining articles, only meeting to discuss and resolve any ambiguous or troublesome coding.

With regard to the dependent variable in each study, there are many operationalizations of escalation in the literature. For instance, individuals may commit additional resources to a particular course of action, report an increased likelihood of continuance, or simply choose to continue. These examples are all characterized as escalating commitment, as they all involve persistence in a failing course of action. Next, we will discuss how we coded study criteria for each article to examine moderating relationships.

Volition in the initial decision. A variable was created to indicate whether the initial decision to engage in a subsequently failing course of action was either explicitly chosen by or assigned to study participants. Responsibility was considered explicitly chosen when participants specifically chose whether to initially devote resources to the failing course of action, whereas responsibility was considered assigned when participants were informed they had made the initial decision.

Covariation of sunk cost and project completion effects. We also coded whether each study explicitly covaried sunk cost with project completion information. Studies were considered to do so if they framed the escalation decision in such a way that it simultaneously contained information about sunk costs and proximity to project completion without independently manipulating these factors.

Influence of opportunity cost information. A variable was also created to code whether a study involved presenting opportunity cost information to the participants before they made their escalation decision. Opportunity costs were coded as present if participants were given any information indicating that they had an alternative other than the decision to escalate (e.g., the chance to abandon the current project and instead invest the remaining budget in a savings account); otherwise we coded the study as having no opportunity costs present.

Shared responsibility effects. As for our examination of shared responsibility, we considered responsibility shared if more than one individual held authority for an escalation decision (e.g., if the focal decision maker was subject to monitoring from another individual). We coded this variable as unshared if authority for the escalation decision rested with a single individual (e.g., a manager deciding whether to continue a project).

Meta-analysis Procedure

We used the Hunter and Schmidt (2004) method of generating statistically corrected effect size estimates. In particular, raw effect sizes found in pri-

mary studies were corrected for measurement error in both the predictor and escalation of commitment criterion. When available, the internal consistency reliability was used; otherwise, we calculated and used the average estimate provided for a construct (Lipsey & Wilson, 2001). Furthermore, when unable to generate an average reliability estimate, we used a conservative standard of .80 (e.g., Bommer, Johnson, Rich, Podsakoff, & Mackenzie, 1995; Dalton, Daily, Johnson, & Ellstrand, 1999). In addition to providing point estimates for true-score correlations along with their standard deviations and 95% confidence intervals, we also calculated their 80% credibility intervals to examine effect size variability (Whitener, 1990). Finally, to address the file drawer effect (Rosenthal, 1979), we computed the *fail-safe N* for each statistically significant effect size (Hunter & Schmidt, 2004). This estimates the number of past or future studies with null findings that would be needed to reduce corrected correlations to a specified lower value; in our case we used a ρ of .05.

Two important study characteristics that may create variance across samples are participant type and empirical setting. To examine the moderating effect of participant type, we created a variable to code whether a study involved undergraduates, or whether graduate students (e.g., MBA candidates) and/or working professionals were studied. This variable had no moderating effect on responsibility ($\rho = .299$, $k = 28$, $CI_{.95} = .249$ to $.349$ vs. $\rho = .251$, $k = 19$, $CI_{.95} = .172$ to $.331$), sunk costs ($\rho = .239$, $k = 22$, $CI_{.95} = .105$ to $.373$ vs. $\rho = .241$, $k = 10$, $CI_{.95} = -.101$ to $.583$), or project completion ($\rho = .377$, $k = 9$, $CI_{.95} = .304$ to $.449$ vs. $\rho = .701$, $k = 4$, $CI_{.95} = .389$ to $> .999$). Thus, we find no evidence that participant type influenced how decision makers responded in escalation situations.

Turning to the empirical setting, we note the concern that researchers might create “ideal” or even the “minimal” conditions necessary to reveal an effect in a controlled environment (Prentice & Miller, 1992).⁴ Thus, we coded whether each study was laboratory-based or was a nonlaboratory study, for instance field or archival. We found no moderating effect of this variable on responsibility ($\rho = .277$, $k = 50$, $CI_{.95} = .231$ to $.323$ vs. $\rho = .178$, $k = 4$, $CI_{.95} = .080$ to $.276$, respectively), as the confidence intervals were overlapping. We were unable to test this study characteristic on sunk costs or project completion because there were not enough nonlaboratory studies available, given our inclusion

⁴ We thank an anonymous reviewer for this consideration.

criteria, to allow for subgroup analyses. Though this is unfortunate for purposes of testing for variance associated with study characteristics across samples, it also indicates that empirical setting will necessarily *not* be a significant issue for these variables.

Our findings are consistent with recent evidence suggesting that the methodological approach and judgment calls in meta-analyses generally have a marginal impact on obtained effect sizes (Aguinis, Dalton, Bosco, Pierce, & Dalton, 2011). In sum, we believe our meta-analysis represents a comprehensive examination of the escalation literature.

RESULTS

Main Effects

Please refer to Table 2 for the results of our main effect hypotheses. For clarity, we summarize these results below in order of determinant classification and whether they are positively or negatively associated with escalation.

Project determinants. In terms of project determinants, those negatively associated with escalation included decision risk (H1; $\rho = -.287$, $n = 987$, $k = 9$), the presence of opportunity cost informa-

tion (H2; $\rho = -.380$, $n = 692$, $k = 6$), and information acquisition (H3a; $\rho = -.352$, $n = 411$, $k = 4$). The project determinants with positive relationships with escalation included the presence of decision uncertainty (H3b; $\rho = .345$, $n = 542$, $k = 5$), positive performance trend information (H4; $\rho = .281$, $n = 1,778$, $k = 9$), and an expressed preference for the initial decision (H5; $\rho = .393$, $n = 447$, $k = 3$).

Psychological determinants. A number of psychological determinants had a positive relationship with escalation, including sunk costs (H6a; $\rho = .243$, $n = 5,524$, $k = 34$), time investment (H6b; $\rho = .432$, $n = 1,664$, $k = 7$), decision maker experience or expertise (H7a; $\rho = .209$, $n = 2,593$, $k = 12$), self-efficacy or confidence (H7b; $\rho = .219$, $n = 2,833$, $k = 9$), personal responsibility for the initial decision (H8; $\rho = .258$, $n = 8,625$, $k = 54$), ego threat (H9; $\rho = .473$, $n = 391$, $k = 8$), and proximity to project completion (H12; $\rho = .393$, $n = 3,073$, $k = 14$). The psychological determinants having negative relationships with escalation were anticipated regret (H10; $\rho = -.434$, $n = 668$, $k = 6$) and positive information framing (H11; $\rho = -.349$, $n = 2,010$, $k = 8$).

TABLE 2
Determinants of Escalation of Commitment: Main Effect Results^a

Determinants of Escalation	<i>k</i>	<i>n</i>	<i>r</i>	ρ	s.d. _{ρ}	CV _{.80}	CI _{.95}	Fail-safe <i>N</i>
Project Determinants								
H1. Decision risk	9	987	-.230	-.287	.209	-.554, -.020	-.436, -.138	43
H2. Opportunity cost information	6	692	-.304	-.380	.258	-.711, -.049	-.598, -.162	40
H3. Information set:								
a. Information acquisition	4	411	-.281	-.352	.000	-.352, -.352	-.441, -.262	24
b. Decision uncertainty	5	542	.276	.345	.117	.195, .494	.216, .474	29
H4. Positive performance trend information	9	1,778	.228	.281	.095	.159, .403	.205, .357	42
H5. Expressed preference for initial decision	3	447	.315	.393	.160	.189, .598	.194, .593	21
Psychological Determinants								
H6. Previous resource expenditures:								
a. Sunk costs	34	5,524	.195	.243	.378	-.240, .727	.114, .373	132
b. Time investment	7	1,664	.346	.432	.243	.122, .743	.247, .617	54
H7. Familiarity with decision context:								
a. Experience/expertise	12	2,593	.166	.209	.133	.038, .379	.125, .293	38
b. Self-efficacy/confidence	9	2,833	.173	.219	.190	-.024, .462	.090, .348	30
H8. Personal responsibility for initial decision	54	8,625	.207	.258	.141	.077, .439	.216, .301	225
H9. Ego threat	8	391	.378	.473	.190	.229, .716	.315, .630	68
H10. Anticipated regret	6	668	-.347	-.434	.000	-.434, -.434	-.501, -.367	46
H11. Information framing ("negative" = 0, "positive" = 1)	8	2,010	-.279	-.349	.166	-.561, -.136	-.471, -.227	48
H12. Proximity to project completion	14	3,073	.315	.393	.150	.201, .585	.308, .478	96
Social Determinants								
H13. Public evaluation of decision	10	1,128	.162	.203	.458	-.384, .790	-.087, .493	
H14. Resistance to decision from others	3	360	-.122	-.176	.468	-.776, .423	-.716, .364	
H15. Group identity or cohesiveness strength	3	138	.246	.307	.000	.307, .307	.149, .466	15
Structural Determinants								
H16. Agency problems	4	1,079	.246	.308	.000	.308, .308	.251, .364	21

^a *k* = Number of independent samples; *n* = total number of units (individuals or groups); *r* = sample-size-weighted average correlation; ρ = estimated true-score correlation; s.d. _{ρ} = standard deviation of estimated true-score correlation; CV_{.80} = 80% credibility interval; CI_{.95} = 95% confidence interval; fail-safe *N* = number of past or future studies with null findings needed to reduce ρ to .05.

Social and structural determinants. The only social determinant having a significant relationship with escalation was group identity or cohesiveness strength (H15; $\rho = .307$, $n = 138$, $k = 3$), which had a positive relationship. Public evaluation of the decision and resistance to the decision from others (H13 and H14, respectively) had nonsignificant relationships with escalation. Turning to our structural determinants, the sole structural determinant we discovered with sufficient frequency in the literature, agency problems, had a significantly positive relationship with escalation (H16; $\rho = .308$, $n = 1,079$, $k = 4$).

Summary of main effect results. In total, we found support for 14 of our 16 main effect predictions. Only two antecedents, both in the social determinants category (public evaluation of the decision and resistance to the decision from others), failed to reach statistical significance. All of the antecedents from the project, psychological, and structural determinant categories were significant in the predicted directions.

Moderating Effects

The results of our moderator analyses are presented in Table 3. We also provide summary information below.

Volition in the initial decision. Drawing on recent evidence (Schulz-Hardt et al., 2009) challenging the role of self-justification and the responsibility effect, we predicted that personal responsibility for the initial decision to begin a later failing course of action would lead to higher levels of escalation when such responsibility stemmed from a decision maker explicitly choosing to pursue the initial course of action as opposed to being told he or she had made the decision. Our results showed that the relationship between responsibility for the initial decision and escalation behavior was *not* influenced by whether the initial decision was explicitly chosen ($\rho = .289$, $k = 32$, $CI_{.95} = .236$ to $.343$) or assigned ($\rho = .238$, $k = 19$, $CI_{.95} = .164$ to $.311$), even at a more liberal significance level of $p < .10$; and thus Hypothesis 17 did not receive support.

Covariation of sunk cost and project completion effects. To gain further insight into the goal substitution effect and how it compares to the self-justification perspective on escalation, we predicted (Hypothesis 18) that the degree to which sunk costs influence escalation will be more pronounced when sunk cost and project completion information are explicitly covaried, as compared to when they are not. Our results supported this hypothesis. In particular, the relationship between sunk costs and escalation was higher when the two

TABLE 3
Determinants of Escalation of Commitment: Moderating Effect Results^a

Moderators	<i>k</i>	<i>n</i>	<i>r</i>	ρ	s.d. _{ρ}	CV _{.80}	CI _{.95}	Fail-safe <i>N</i>
H17. Volition in Initial Decision								
Responsibility for initial decision								
<i>Explicitly chosen</i>	32	5,113	.232	.289	.134	.118, .461	.236, .343	153
<i>Assigned</i>	19	2,964	.190	.238	.144	.053, .422	.164, .311	71
H18. Covariation of Sunk Cost and Project Completion Effects								
Sunk costs								
<i>Explicit covariation</i>	5	945	.423	.528	.216	.252, .805	.332, .725	48
<i>No explicit covariation</i>	28	3,821	.080	.100	.356	-.356, .556	-.036, .236	
H19. Influence of Opportunity Cost Information								
a. Responsibility								
<i>Opportunity costs present</i>	22	3,030	.267	.334	.102	.204, .465	.280, .388	125
<i>Not present</i>	30	5,335	.177	.221	.144	.037, .406	.164, .279	103
b. Sunk costs								
<i>Opportunity costs present</i>	8	553	.297	.372	.149	.182, .562	.243, .500	51
<i>Not present</i>	22	3,776	.109	.137	.401	-.377, .651	-.034, .307	
c. Project completion								
<i>Opportunity costs present</i>	2	223	.499	.609	.000	.609, .609	.510, .708	22
<i>Not present</i>	10	2,726	.288	.360	.128	.196, .523	.273, .446	62
H20. Shared Responsibility Effects								
Responsibility for initial decision								
<i>Decision authority shared</i>	4	310	.392	.490	.000	.490, .490	.395, .585	35
<i>Not shared</i>	45	6,723	.205	.257	.132	.088, .425	.212, .301	186

^a *k* = Number of independent samples; *n* = total number of units (individuals or groups); *r* = sample-size-weighted average correlation; ρ = estimated true-score correlation; s.d. _{ρ} = standard deviation of estimated true-score correlation; CV_{.80} = 80% credibility interval; CI_{.95} = 95% confidence interval; fail-safe *N* = number of past or future studies with null findings needed to reduce ρ to .05.

determinants were explicitly covaried ($\rho = .528$, $k = 5$, $CI_{.95} = .332$ to $.725$) than when they were not ($\rho = .100$, $k = 28$, $CI_{.95} = -.036$ to $.236$).

Influence of opportunity cost information. Next, we were interested in investigating the influence of opportunity costs on the traditional drivers of escalation. In particular, we asserted (Hypothesis 19) that the relationship between escalation and (a) responsibility for an initial decision, (b) sunk costs, and (c) proximity to project completion will be stronger when opportunity costs associated with the failing course of action are salient to a decision maker. Support for this hypothesis was mixed, depending on the variable examined. In particular, we received support for Hypothesis 19a, as opportunity costs enhanced the relationship between responsibility and escalation ($\rho = .334$, $k = 22$, $CI_{.95} = .280$ to $.388$ vs. $\rho = .221$, $k = 30$, $CI_{.95} = .164$ to $.279$). However, our prediction that opportunity costs would strengthen the relationship between sunk costs and escalation (Hypothesis 19b) was not supported ($\rho = .372$, $k = 8$, $CI_{.95} = .243$ to $.500$ vs. $\rho = .137$, $k = 22$, $CI_{.95} = -.034$ to $.307$), even at a significance level of $p < .10$. Finally, our prediction that opportunity costs would strengthen the relationship between proximity to project completion and escalation (Hypothesis 19c) was supported ($\rho = .609$, $k = 2$, $CI_{.95} = .510$ to $.708$ vs. $\rho = .360$, $k = 10$, $CI_{.95} = .273$ to $.446$); however, this last result should be interpreted cautiously as the number of studies in which opportunity costs were present was minimal. Thus, though each of these predictions resulted in corrected effect sizes in the forecasted directions, only Hypotheses 19a and 19c were supported.

Shared responsibility effects. Lastly, to explore the influence of a self-presentation perspective on the traditional responsibility effect, we predicted that responsibility for the failing course of action would have a stronger effect on escalation when decision authority is shared, as opposed to not shared. This prediction was supported ($\rho = .490$, $k = 4$, $CI_{.95} = .395$ to $.585$ vs. $\rho = .257$, $k = 45$, $CI_{.95} = .212$ to $.301$), thus confirming Hypothesis 20.

DISCUSSION

At the outset of our study, we promised three primary contributions to the field. Having completed our meta-analysis, it is time to discuss how our findings inform these issues. In particular, we first discuss the state of research regarding the various determinants of escalation to present a comprehensive overview of the antecedents found in the literature. Second, we present an analysis of the

power of different theoretical perspectives to explain escalation. Third, and most importantly in our view, we discuss the relative efficacy of these different theoretical perspectives by integrating the results of our moderator analyses to offer insights into when and how particular theories are more predictive of escalation than others.

State of Research on Escalation Determinants

First, we offer an assessment of the level of understanding in the literature regarding the range of escalation determinants that have been examined. In terms of categories of determinants, we showed that the current state of the literature reflects a “feast or famine” dilemma. The feast areas are represented by the many studies that can be found analyzing project and psychological determinants. The attention toward psychological determinants, in particular, is not surprising, given that the roots of escalation reside in the applied psychology literature. However, the availability of a large number of studies in these areas may create a self-fulfilling prophecy whereby researchers continue to do more studies in these areas because they are more certain of where they can position their studies in the literature.

On the other hand, the famine areas are represented by the relative dearth of empirical studies examining social and structural determinants. We view this skewed attention by researchers to be rather unfortunate, as organizations are rich contexts within which escalation commonly occurs, and social and structural determinants are likely to be powerful factors leading to or inhibiting escalation tendencies. Below, we briefly consider what social and structural factors escalation researchers might examine to add to understanding of the escalation phenomenon.

Social determinants that exist both within and outside a firm may influence escalation. For instance, the social pressures generated by norms can be a significant determinant of behavior (Ajzen, 1991), especially if the norms emanate from a group with which an individual strongly identifies (Terry & Hogg, 1996). Hence, a manager working for a department that does not tolerate failure might find it difficult to abandon a failing project, particularly if the manager values membership in the department. Additionally, de-escalation would be even less likely if it might negatively impact a colleague with a substantial amount of power and status in the organization. This illustration of organizational politics clearly shows how it might affect the tendency to escalate; however, the literature is mostly silent on its influence (see Guler [2007] for an ex-

ception). We therefore encourage research on the complex role of politics and its various correlates such as intraorganizational competition for scarce resources (Stein, 1997). At the interorganizational level of analysis, social pressures from outside actors may also influence the choice of whether to escalate or de-escalate. For example, the competitive dynamics in markets may either lock firms into courses of action or lead them to exit previous courses as they respond to the competitive actions of rivals (Chen, Su, & Tsai, 2007). More generally, the institutional pressures that organizations face can cause them to undertake and continue with a course of action in spite of evidence that it is not a positive one (McNamara, Halebian, & Dykes, 2008).

Turning to structural factors, we note that there are organizational interdependencies that can exacerbate the commitment to a failing course of action (Stern & Henderson, 2004). For example, organizations often share resources between divisions, and they may persist with a failing course of action as a consequence of these resource interdependencies (e.g., three brands of an automobile manufacturer may share a production plant, which may limit the discretion of any one brand to end their product so as not to injure the other two divisions). Additionally, the compensation structure of managers can affect their escalation tendencies by influencing their risk bearing and the degree to which they benefit from maximizing firm performance or suffer from persisting with failing courses of action (Devers, McNamara, Wiseman, & Arrfelt, 2008).

Our above recommendations for future research directions regarding social and structural determinants highlight the need for more work in these areas. We note that our ability to detect unequal attention across categories of determinants was greatly enhanced through our use of the Staw and Ross (1987) model. Frameworks such as this are often useful as a stimulant for theory building (cf. Doty & Glick, 1994), and we urge escalation researchers to think creatively as they seek to advance knowledge of the construct.⁵

Drawing from the results in Table 2, we can assess the relative strength of the various determinants of escalation. Although the confidence intervals for many of the variables overlap, meaning that we cannot draw statistically significant inferences from several of the comparisons, we can get some

sense of the influence of different antecedents by looking at their estimated true-score correlations.

In terms of factors that exacerbate escalation, we find that one of the most powerful drivers is whether a decision maker faces a strong ego threat. Thus, the desire to “save face” and maintain one’s reputation appears to be a strong situational force affecting the tendency to escalate. Additionally, the time a person has invested in a failing course of action is also among the most influential antecedents of escalation. In addition to self-justification pressures, it may be that as individuals find themselves investing more and more of their valuable time into the course of action, they infer a positive attitude toward escalation from this persistent behavior, in keeping with the psychological literature on self-inference and attitude change (e.g., Bem, 1972).

In contrast, perceived familiarity with the decision context had a more modest effect on the likelihood of escalation. Some research does suggest that indicators of perceived familiarity, such as confidence (Judge, Erez, & Bono, 1998) or age (Ryan, Brutus, Greguras, & Hakel, 2000), might lead managers to be less receptive to feedback than their less confident or younger peers. This tendency to discount feedback (for instance, negative feedback about a course of action) may partly explain how self-justification leads to commitment escalation when perceived familiarity with a decision context is high. However, research also suggests that experienced managers tend to be rather skillful in attending to the most relevant feedback cues in their environment (Ashford, 1993). Receiving feedback regarding project failure would seem to be a relevant cue for experienced managers, and thus this research, combined with the above on the discounting of feedback, may explain why the effect of familiarity on escalation is only modest.

Turning to factors that reduce the likelihood of escalation, we note from our review that three of the strongest inhibitors are anticipated regret, the salience of opportunity cost information (but perhaps only when project completion or degree of responsibility are low; see our moderator discussion below), and information acquisition. These determinants illustrate both the emerging view of emotions as important to decision making (Loewenstein, Weber, Hsee, & Welch, 2001) in addition to the traditional economic perspective of optimizing decision utility through the provision of relevant informational cues (Schoemaker, 1982). Thus, making affective information salient in terms of how bad managers might feel should a project continue to fail, or providing more “objective” information (in the form of opportunity cost data in certain

⁵ As an example, see Solinger, van Olffen, and Roe (2008) for an insightful analysis and reconceptualization of organizational commitment using a standard framework from attitude research.

circumstances or in terms of additional feedback about how the current project is going) should help decision makers realize the futility of continuing and would appear to be good pieces of advice for managers contemplating the continuation of failing projects.

Power of Different Theoretical Perspectives to Explain Escalation

Second, with the results of our meta-analysis, we are able to assess the degree of support for the primary theories discussed in the literature on escalation of commitment. At the outset of our study, we identified six of the central theoretical perspectives in the literature, namely the subjective expected utility (e.g., Savage, 1954) approach in addition to self-justification theory (e.g., Aronson, 1968; Festinger, 1957), prospect theory (e.g., Kahneman & Tversky, 1979), the goal substitution effect (e.g., Conlon & Garland, 1993), self-presentation theory (e.g., Goffman, 1959; Jones & Pittman, 1982), and agency theory (e.g., Eisenhardt, 1989; Jensen & Meckling, 1976). We view these as the fundamental building blocks of the main effect hypotheses we presented in Table 1, most of which were supported by our meta-analysis, as shown in Table 2. Hence, it seems apparent that each perspective has some merit as an explanatory force behind escalation of commitment. The potential exception may be self-presentation theory, which served as a central perspective driving three main effect hypotheses, of which only one received support. This may in part be due to the nature of self-presentation theory. Rooted in sociology, it is arguably a higher-level theory than others we investigated, such as self-justification or prospect theory. Hence, it may only have tangential explanatory power beyond that explained by other theories of escalation.

Overall, our study has offered meta-analytical support for a number of theories via which escalation behavior has been studied. Such an array of theoretical perspectives might be viewed as overwhelming or unsettling to some, yet we believe it is a testimony to the robustness of escalation. This is consistent with the “multi-theoretical perspective” on escalation presented in an early study by Staw and Ross (1978), who demonstrated that a variety of theoretical lenses can be used to explore the phenomenon. However, we wish to point out that different operationalizations stemming from the same theoretical perspective are sometimes differentially related to escalation. Consider the many determinants that stem from self-justification theory. Note in Table 2 that the estimated true-score correlation

(and associated 95% confidence interval) of ego threat is higher than those of other antecedents stemming from the self-justification perspective, including personal responsibility for the initial decision and decision maker experience or expertise. Thus, although a theoretical perspective can receive considerable support, the manner in which its key constructs are operationalized makes a difference.

Relative Efficacy of Different Theoretical Perspectives

Finally, going beyond testing main effects of escalation, we also investigated the manner in which the various theories of escalation interact with each other. More specifically, we tested a number of moderating hypotheses to gain insight into the relative efficacy of the different theoretical approaches to escalation. First, in keeping with recent evidence challenging the traditional responsibility effect (Schulz-Hardt et al., 2009), we predicted (Hypothesis 17) that responsibility for an initial decision will have a stronger relationship with escalation when the initial decision was explicitly chosen as compared to assigned. The data did not support this hypothesis. Note that we did, in fact, receive support for our main effect prediction (Hypothesis 5) that a preference for the initial decision would lead to escalation, and thus the “preference effect” shown in Schulz-Hardt et al. (2009), and consistent with the utility-based view of escalation, appears to have validity; however, our results suggest that it may not, across studies, explain much incremental validity beyond that of felt responsibility and its associated self-justification concerns (which we also revealed to have a significant main effect; see Hypothesis 8). We would like to note that the 95% confidence interval for when responsibility was assigned did not include zero ($p = .164$ to $.311$), and hence it appears that self-justification needs may be stimulated enough to promote escalation *even if responsibility is merely assigned* to decision makers, regardless of whether they agreed with the initial decision.

Though the results of our main effects and first moderator analysis revealed that self-justification theory appears to be a powerful driver of escalation, our next moderator analysis suggests that its influence is not universal. Many studies in the empirical literature on escalation have evoked self-justification theory via sunk costs or responsibility effects, but Conlon and Garland (1993) advanced another explanation, namely, goal substitution and its effect on escalation as courses of action approach completion. Our meta-analysis provided an

opportunity to test the assertion that the goal substitution effect has been confounded by (and thus hidden in) research on sunk costs. We predicted (Hypothesis 18) and found support for the idea that the relationship between sunk costs and escalation will be strengthened when sunk costs are explicitly covaried with project completion information as compared to when no such covariation takes place. However, we present this finding cautiously, since the number of sunk cost effect sizes with such covariation was only five.

To our surprise, we also found that the 95% confidence interval for sunk cost studies with no explicit covariation actually includes zero ($\rho = -.036$ to $.236$), and thus the extent to which sunk costs impact escalation (absent the simultaneous presentation of covaried project completion information) is called into question. Recall that we did, in fact, find support for a main effect of sunk costs (Hypothesis 6a); however, the results of our moderator analysis reveal that, upon more refined examination, the sunk cost effect may not be as robust as the literature would suggest. We find it interesting to note that even though the project completion argument has been in the escalation literature for over 15 years (Conlon & Garland, 1993), many studies, even recent ones, refer to the sunk cost effect when reviewing the escalation literature but do not even acknowledge the influence of project completion (e.g., Berg et al., 2009; Ku, 2008; Schulz-Hardt et al., 2009). We suggest that researchers take care in their manipulations of sunk cost in future studies and that they devote more attention to the influence of project completion, in addition to conducting studies that follow up on our finding that sunk costs, when not covaried with project completion information, can yield such low effect sizes. Research on mental accounting budgets (Thaler, 1985) and their effects on escalation (e.g., Heath, 1995; Tan & Yates, 2002) may help direct future studies on the sunk cost effect, as this stream of research holds that decision makers escalate in response to sunk costs when they do not set a mental accounting budget or when they find it difficult to track expenses. If these conditions do not occur, individuals may actually de-escalate commitment in response to sunk costs, which might account for some of the inconsistent findings.

As we mentioned earlier, a common recommendation for combating the escalation bias has been to make salient to decision makers information about the factors surrounding the failed course of action, such as the opportunity costs associated with continuance (see Keil et al., 1995; Northcraft & Neale, 1986). The rationale for this is that providing objective project information to decision makers may

stimulate a more *homo economicus* orientation to the decision, and in particular, that they would realize the (often) unlikely chance that the course of action will improve. More concretely, it follows from subjective expected utility theory that decision makers who actively consider opportunity costs will tend to generate a relatively lower expected utility for the failing course of action and a relatively higher expected utility for de-escalating in favor of alternative course(s) of action. Using this theoretical logic, we reasoned and found support for our main effect predictions that making opportunity costs salient (Hypothesis 2) or providing clarity on the information set surrounding a decision (Hypothesis 3) discourages decision makers from escalating commitment to failing courses of action. However, we anticipated that a more complex narrative would emerge if this utility-based reasoning were considered in the context of more psychologically oriented theoretical perspectives, namely self-justification theory and the goal substitution effect.

Our self-justification reasoning for the moderating effect of opportunity costs on the responsibility and sunk cost effects was that decision makers aware of opportunity costs will be especially likely to have self-justification needs, as such information makes even more salient what they have already given up in pursuit of the failing course of action. Our goal substitution rationale for the moderating effect of opportunity costs on the project completion effect was that opportunity cost salience would increase the perceived loss of a failing project, thus heightening the degree to which managers substitute a completion goal for the original goals of a project. As predicted, we found that the salience of opportunity costs actually *accentuated* the relationships between both felt responsibility and proximity to project completion on escalation. However, the same prediction did not hold for the sunk cost effect. To follow up on this finding, we conducted post hoc analyses including only sunk cost studies *not* explicitly covarying project completion information; however, the hypothesis remained unsupported with this adjustment ($\rho = .351$, $k = 4$, $CI_{.95} = .213$ to $.489$ vs. $\rho = .135$, $k = 9$, $CI_{.95} = -.028$ to $.299$), even at a significance level of $p < .10$.

Overall, these particular findings seem to suggest that at low levels of felt responsibility or project completion, the presentation of opportunity costs may provide an "escape clause" for decision makers whereby they can readily de-escalate commitment. However, the case may be entirely different at high levels of felt responsibility or project completion: Organizational interventions aimed at at-

tenuating the escalation bias by making opportunity costs salient may sometimes backfire, as this additional information may actually act as an accelerant and fuel decision makers' continuation of the failing course of action. As such, the seemingly well-documented advice that managers make opportunity costs salient should be a qualified recommendation, contingent upon the degree of felt responsibility or extant levels of project completion. As researchers further explore the influence of opportunity costs on escalation, a useful springboard might be to utilize the multiple-stage perspective on escalation advanced by McCain (1986). For instance, it may be the case that opportunity costs are more important early in the escalation cycle, before other processes (e.g., felt responsibility or the advancement of the project) have a chance to factor into the decision.

Organizational decisions are often not made unilaterally but are instead shared among multiple constituents. Social processes such as self-presentation can have a strong effect on behavior (Goffman, 1959; Jones & Pittman, 1982; Tetlock, 1992), and thus it is important for researchers to understand how social influence affects commitment escalation over and above the more commonly examined explanations such as self-justification theory. We predicted and found support for the idea that the relationship between initial responsibility and escalation would be stronger when decision authority is shared. From this finding, it could be suggested that managers be especially sensitive to escalation-like situations that may ensue when responsibility is shared among multiple organizational members. As social processes can be quite complex, there are likely a number of mediating influences in this finding, and thus future research is needed in this area. The growing desire to understand social processes in management is reflected in the burgeoning research on team dynamics, as work in organizations has become increasingly complex and team-based (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Mathieu, Maynard, Rapp, & Gilson, 2008). Unfortunately, escalation in group contexts has received little attention (for exceptions, see Bazerman et al. [1984], Seibert and Goltz [2001], and Whyte [1991]). The investigation of social context is a vastly underrepresented area in the escalation literature in spite of its significance in organizations, and hence we urge researchers to pursue this fruitful avenue.

Limitations

Like any meta-analysis, our study has some limitations. Unfortunately, we were unable to include

nonquantitative studies of escalation (e.g., Ross & Staw, 1986, 1993) or studies that included data that could not be converted to effect sizes—for instance, those presenting only multiple regression coefficients. Also, although we put forth our best effort in identifying and including in our study the central theoretical drivers of escalation, we inevitably had to exclude some perspectives. Some were excluded because they infrequently appeared in the literature, and hence were not theoretical perspectives that could be meta-analytically reviewed, such as the “decision dilemma” (Bowen, 1987) and reinforcement theory perspectives (Skinner, 1953; see Staw & Ross, 1978). Others were not included because they, though often novel and useful in their own regard, were either theoretically underdeveloped and thus hard to test, or were subsumed within more established theories, for instance the cultural norm of not wanting to appear wasteful (Arkes & Blumer, 1985). Despite these limitations, we hope our study has offered some clarity to existing knowledge of escalation and sparked ideas for future research, in addition to offering some practical advice to managers.

Conclusions

We believe the literature on escalation of commitment has been insightful and interesting over the years, as it has discovered a large number of robust determinants that lead to escalation. However, we also believe there is room for improvement. Researchers have emphasized project and psychological determinants at the expense of social or structural factors. We believe that organizations provide a rich contextual backdrop against which to study escalation, and such social and structural determinants are likely to yield interesting results. We also found very few studies that were longitudinal or conducted in field settings, as most research has been cross-sectional lab studies. We thereby urge researchers to look for new ways to study the determinants of escalation.

Our study revealed some intriguing results, including that (1) having explicitly chosen a failing course of action may result in no higher levels of escalation than having been merely assigned responsibility for such a choice; (2) the prominence of sunk costs was lower than expected; (3) opportunity cost salience can lead to de-escalation in some situations but escalation in others; and (4) the sharing of decision authority may lead to greater levels of escalation. These discoveries highlight the important role of meta-analysis in research. A traditional narrative review may not have uncovered these findings, whereas a quan-

titative review allowed us to detect such nuances across independent studies. We also feel that our results highlight the need to de-emphasize efforts to continue identifying determinant “effects” and instead give attention to integrating and exploring more deeply the core theories driving escalation. Although this agenda is likely to prove rather challenging as research moves forward, scholars must persist in our efforts, as the field has invested too much into knowledge of escalation to quit now.

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