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How to Turn Around: Escalation of Commitment in the Context of ISD Project Distress

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Completed Research Paper

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Abstract

While information systems development (ISD) projects play a pivotal role in maintaining a competitive advantage, ISD project distress evolves dramatically. Given the complex and dynamic nature of ISD projects, they are prone to Escalation of Commitment (EoC), the irrational tendency to persist with failing courses of action. While EoC has been studied to a great extent in management and psychology literature, research on its role in the context of ISD project distress is fragmented, making it challenging to develop de-escalation strategies. To address this gap, we conduct a literature review on EoC in the context of ISD project distress. The proposed nomological net including triggering factors, consequences, mediators, and moderators, as well as a set of developed de-escalation strategies can serve as an inspiration and foundation for future IS researchers. By presenting this review we hope to inform future IS research to acknowledge the role of EoC in ISD projects.

Keywords: ISD project distress, project management, escalation of commitment, decision-making

Introduction

While information systems development (ISD) projects play a pivotal role in shaping the strategic direction of organizations and in enabling them to gain and sustain a competitive advantage, they continue to fail at high rates (Doherty and King 2001; Vaidya et al. 2013), often suggested to be 70% or higher (Doherty et al. 2012; Keil and Mähring 2010). Given the complex, uncertain and dynamic nature of IS projects, many projects continue to run over budget, extend past schedule, and deliver less than or different products than anticipated, needed, or preferred. This calls for further research and expansion of research beyond existing approaches (Doherty et al. 2012). In particular, better understanding ISD project distress, "a troublesome project condition that threatens a project's successful completion" (Baghizadeh et al. 2020, p. 124) and identifying ways of dealing with this condition is of great practical and academic interest. While a distressed ISD project can be dealt with and transformed, only very few studies have looked at how this transformation can be achieved (Baghizadeh et al. 2020).

The escalation of commitment (EoC) literature provides a promising theoretical base for explaining when this type of distress can turn into failure. Despite high awareness of the tendency to persist with failing courses of action and to invest additional resources regardless of negative signs (Sleesman et al. 2018; Staw 1997) in business practice, it can still be observed frequently. Survey results have shown that between 30 percent and 40 percent of all organizational technology projects exhibit some degree of EoC (Keil et al.

2000). On the one hand, when looking at existing EoC literature, researchers point out a neglected integration of contextual factors (Sleesman et al. 2018). Despite its explanatory power, and while the study of EoC in psychology and management research can look back to decades of investigation, research on its role in ISD project distress is fragmented and still in its infancy (Baghizadeh et al. 2020). On the other hand, as the concept of ISD project distress lacks theoretical maturity (Baghizadeh et al. 2020), applying a multilevel and interdisciplinary perspective including internal and contextual factors is promising.

As a first step towards addressing these issues, we aim to synthesize the rich but highly fragmented research on EoC in the context of ISD distress. A better understanding of EoC in this context could help actors involved in ISD projects in identifying, dealing with, and possibly 'rescuing', projects that experience distress. Hence, we pose the following research question:

What is the current body of knowledge regarding the role of escalation of commitment in the context of ISD projects?

To answer our research question, we conducted a structured literature review. Based on our results, we propose a conceptual framework for the study of EoC in the context of ISD project distress. Our contribution to IS research is threefold. Firstly, our review conceptualizes EoC in a relevant and topical context making it easier to address opportunities and challenges. Integrating the status quo on explanations, triggers, mechanisms, and contextual variables leads to a better understanding of what fuels distressed projects turning into failure and eventually helps to develop de-escalation strategies. Secondly, we introduce a novel theoretical perspective built on interdisciplinary research to the field of IS design, development and project management that questions our understanding of IS project failure as a static end. Thirdly, the review adds important knowledge to ISD failure literature by explicitly addressing emerging problems during ISD projects and identifying different mechanisms by which unsuccessful coping with the emerging problems fuels escalation (Mähring et al. 2008).

Conceptual Background

ISD project distress

The rapid progression of new technologies has drastically altered the manner in which IS are being developed and managed in organizations. Meanwhile, to maintain their competitive advantages and digitally transform, organizations invest substantial resources and efforts in their ISD projects (Wallace et al. 2004). Within the area of IS design, development, and project management ISD project distress describes a "troublesome project condition that threatens a project's successful completion" (Baghizadeh et al. 2020, p. 124). In this condition of distress, an ISD project experiences major disturbances that require careful responses. ISD project distress is a situated, dynamic, and fluid constellation of critical problems which are not easily detected, understood, and addressed. A state of distress represents an adverse condition in an ISD project that cannot be routinely resolved and that requires explicit awareness (Baghizadeh et al. 2020).

In their recent review, Baghizadeh et al. (2020) claim that compared to research on failure, a focus on ISD project distress in the IS literature is both promising and currently lacking: "Distressed project conditions and states are neither systematically studied nor well understood and consequently a range of potential interventions to remedy distressed situations are not explored" (Baghizadeh et al. 2020, p. 124). While the opposite of a distressed ISD project is a smoothly running ISD project, it is important to recognize that project distress is a critical state that ultimately might lead to project failure, but that such an outcome is not inevitable.

Escalation of Commitment

EoC is built upon the theory that individuals allocate additional resources to a previously chosen but failing course of action due to personal responsibility for having initiated the course of action (Staw 1976). Investing additional resources in "runaway" projects frequently leads to a waste of valuable resources. Prominent examples include Sony's continued participation in electronics after $8.5billion in losses over 10 years (Tabuchi 2014) and the failed "Taurus" information technology project from the London Stock

Exchange (Drummond 1996). Consequently, the explanation and possible prevention of the EoC phenomenon have become of lasting interest to both practitioners and IS researchers.

While escalation is a general phenomenon that can occur with any type of decision scenario, distressed ISD projects and programs are particularly prone to incur much more resources than originally expected due to their explorative nature and uncertain environment (Baghizadeh et al. 2020). EoC in decisions about ISD projects has the potential to adversely affect an organization's efforts to remain competitive through digital transformation. In the context of ISD, "projects that should have been abandoned during development often proceed through commercialization only to fail in the market at substantially higher costs than if they had been terminated earlier" (Schmidt and Calantone 2002, p. 103). Lessening the impact of the forces behind escalation tendencies becomes of utmost managerial importance as today's digitally disrupted environments force organizations into constant adaptation and renewal (Warner and Wäger 2019).

Escalation occurs when troubled initiatives are continued instead of being redirected or abandoned. According to the Self-Justification Theory (Staw 1976), decision-makers continue to commit resources to self-justify an earlier decision and minimize cognitive dissonance (Brockner 1992). Determinants reinforcing this escalating tendency include decision-specific factors like the type and amount of feedback information, individual factors like the motivation and personality traits of the decision-maker, and external factors like market complexity and environmental uncertainty (Sleesman et al. 2018). Building on the understanding of what gives rise to EoC, research has started to identify factors and mechanisms that combat escalating tendencies. Triggers that can enhance de-escalation tendencies or reduce pre-existing forces for commitment include for instance organizational tolerance for failure and re-defining the decision-making problem (Pan et al. 2004). Still, resisting escalating forces is a challenging task and known de-escalation strategies lack practical implementation (Ohlert and Weißenberger 2020).

Research Design

Our goal is to give a focus and direction to IS researchers by reflecting on the role of EoC in ISD projects based on the existing body of EoC research in management, psychology, and information systems. A systematic literature review following established guidelines (Brocke et al. 2009; Webster and Watson 2002) was conducted to analyze the status quo on research about the role of EoC in an organizational ISD project setting. We decided on a systematic review as the aim of the study is to develop a clear understanding of the current body of knowledge on the broad phenomena of EoC (Paré et al. 2015). We aim at understanding the phenomenon as a whole and its relationships from the parts to the whole. More specifically, our review can be classified as a theoretical review as we draw "on existing conceptual and empirical studies to provide a context for identifying, describing, and transforming into a higher order of theoretical structure" (Paré et al. 2015, p. 188). As our structural dimension to synthesize our findings, we use the building blocks of theory by Whetten (1989). Our sample of papers does not cover all the relevant literature but focuses on a representative set of articles (Paré et al. 2015), thereby organizing prior research on the given topic and examining relationships to facilitate the development of new theories (Paré et al. 2015; Webster and Watson 2002). Following established guidelines on conducting literature reviews (Brocke et al. 2009; Webster and Watson 2002), our review covers relevant publications in peer-reviewed journals and conferences without claiming exhaustiveness.

Search & Selection Process

As the review topic - EoC in ISD projects - can be categorized as interdisciplinary (Management, IS, Psychology), we chose the databases Web of Science Core Collection (WoS), Business Source Premier (BSP), APA PsychInfo (APA), and the AISeLibrary (AIS) for a title, abstract, and keyword search. We searched for only peer-reviewed articles to ensure research quality. Based on highly cited reviews about the conceptualization of EoC (Sleesman et al. 2012, 2018) and Staw's (1976) landmark article we derived search terms describing EoC and related phenomena like persistence, grit, and entrapment. Combined with search terms describing the context of interest - ISD projects - which we adapted from Baghizadeh's et al. (2020) recent review on project distress and Jiang's et al. (2018) highly cited review on program management, we collected an initial set of 494 articles. In the initial screening phase duplicates, articles that are non-English, and those not in the form of a research article (e.g., panel, commentary) have been removed. In the second screening phase, the titles, key-words, and abstracts of the remaining 389 articles were analyzed regarding their fulfillment of inclusion criteria. We only included those articles that were directly related to the topic

(EoC) and the context (ISD projects) of interest, excluding for instance those that looked at EoC in romantic relationships or sports. Also, an organizational setting had to be present, excluding research conducted in public or medical settings. Further, following the inclusion criteria defined by Sleesman et al. (2012, p. 549) we excluded articles "not conforming to the traditional definition of escalation" - i.e., articles related to organizational commitment or escalation of conflict and studies that neglect the negative feedback aspect. This led to a list of 219 research papers. We performed a backward and a forward search on the 20 most cited articles within this list which resulted in 11 additional papers. The final dataset consists of 230 papers from IS outlets (24 papers), business psychology journals (32 papers), psychology journals (66 papers), and journals affiliated with the management and economics disciplines (108 papers). An overview of the process and the final dataset is given in Figure 1.
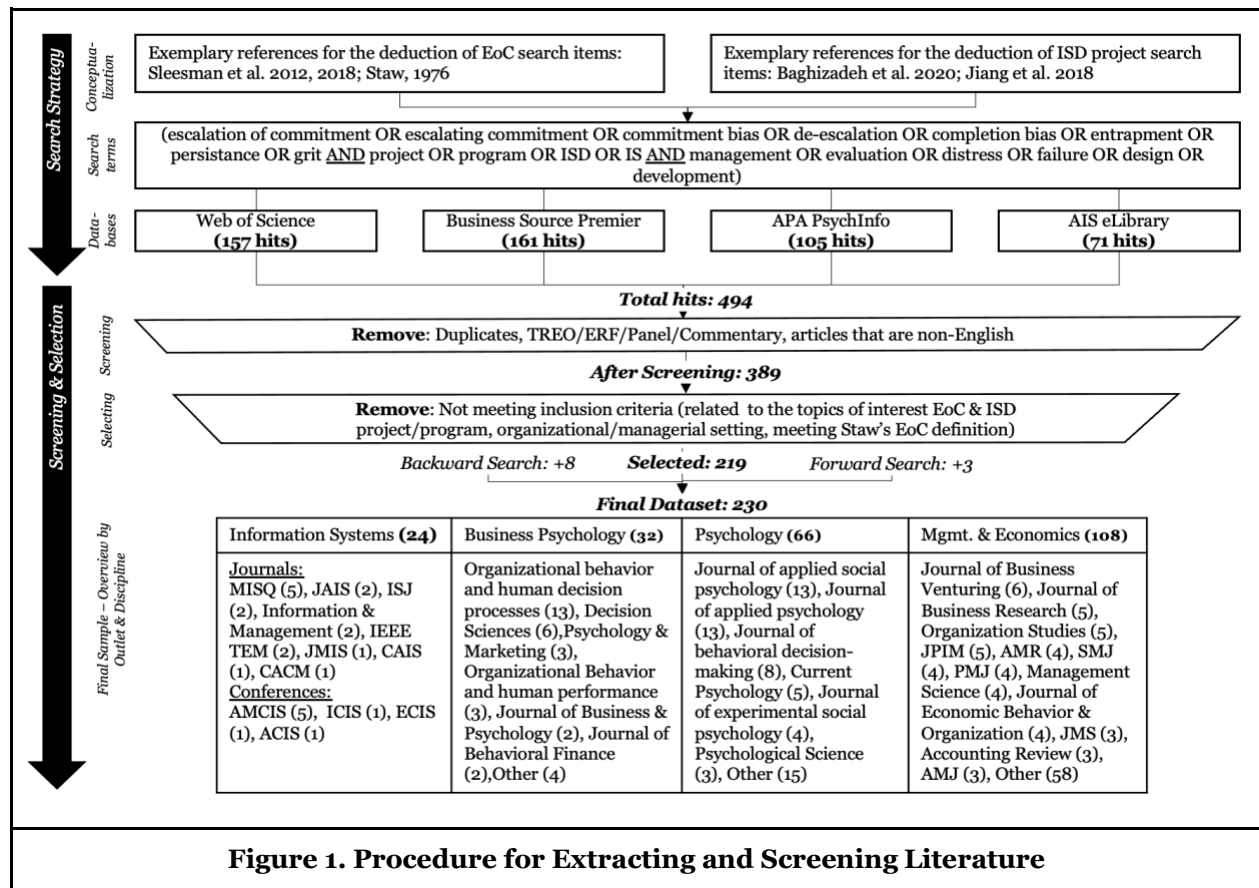
Figure 1. Procedure for Extracting and Screening Literature

Figure 2 provides an overview of the distribution of articles per discipline and over time. Since the seminal article by Staw in 1976, a steady increase in publications can be observed. Within the past 13 years, the total number of articles published on EoC in the context of ISD projects has doubled. Particularly many articles have been published in management and business journals in the last ten years. In addition, the analysis shows that the interest of information systems researchers, who took up the topic in the early 2000s, is increasing.

Figure 2. Overview of Final Dataset by Publication Year and Discipline
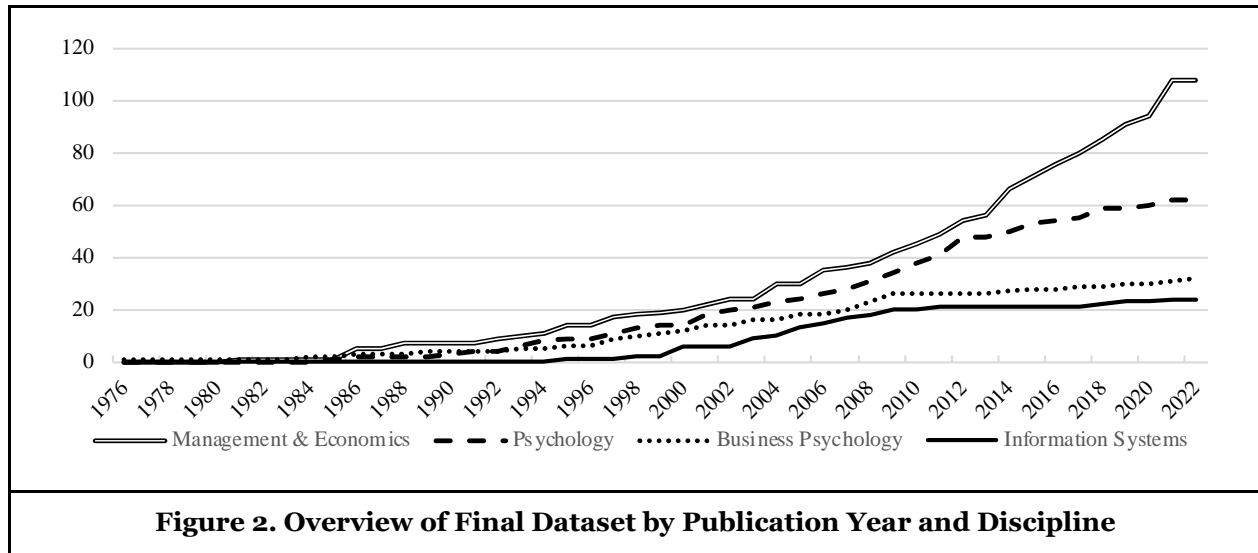
Analysis

The 230 papers were subject to a two-phased analysis which we started with the creation of an Excel sheet with relevant information about the papers. The papers were analyzed in an iterative and concept-centric manner (Duriau et al. 2007; Webster and Watson 2002). We carried out selective coding to generate a comprehensive allocation of codes to our set of articles. Due to page limitations the concept matrix containing the mapping of each code category (manifestation, EoC definition, context, core finding, accelerator, mediator, moderator, de-escalator, negative outcome, positive outcome, method, theory, research focus) with each article is not included in the article. The main code categories (all except method, theory, and research focus) are based on the building blocks of theory (Whetten 1989), including the *what* (nature of the phenomenon)*, how* (relationships with other concepts)*, why* (explanations) and the *who/where/when* (context) of the phenomenon. Regarding the process of the analysis, we randomly chose 10 articles that were part of our sample for a first coding that was discussed by the team of authors. Ending up with the presented code categories we coded all remaining papers based on the title, keywords and abstracts. In a second phase, we identified the 10 most influential papers for each discipline (IS, business psychology, psychology, management & economics) in our dataset based on the number of citations. The analysis was then iterated for those 40 papers based on their full text. This procedure allowed us to combine an in-depth analysis on the influential sub-set across disciplines with a broad overview of the research landscape based on our comparatively large full dataset.

Results

We present the results of the review following the building blocks of theory (Whetten 1989). We start with the *what* of our phenomenon of interest (EoC). We then move to describe triggers and consequences regarding EoC in an ISD project context as different relationships. In the last step, we look at dynamics that could represent moderating and mediating factors within the relationships.

Understanding Escalation of Commitment in ISD projects

Our review revealed a more nuanced conceptualization of EoC as the phenomenon of interest consisting of key attributes, dimensions, and its manifestation in organizational practice. An overview of the synthesis is given in Figure 3.

Figure 3. How Escalation of Commitment Manifests in Organizations
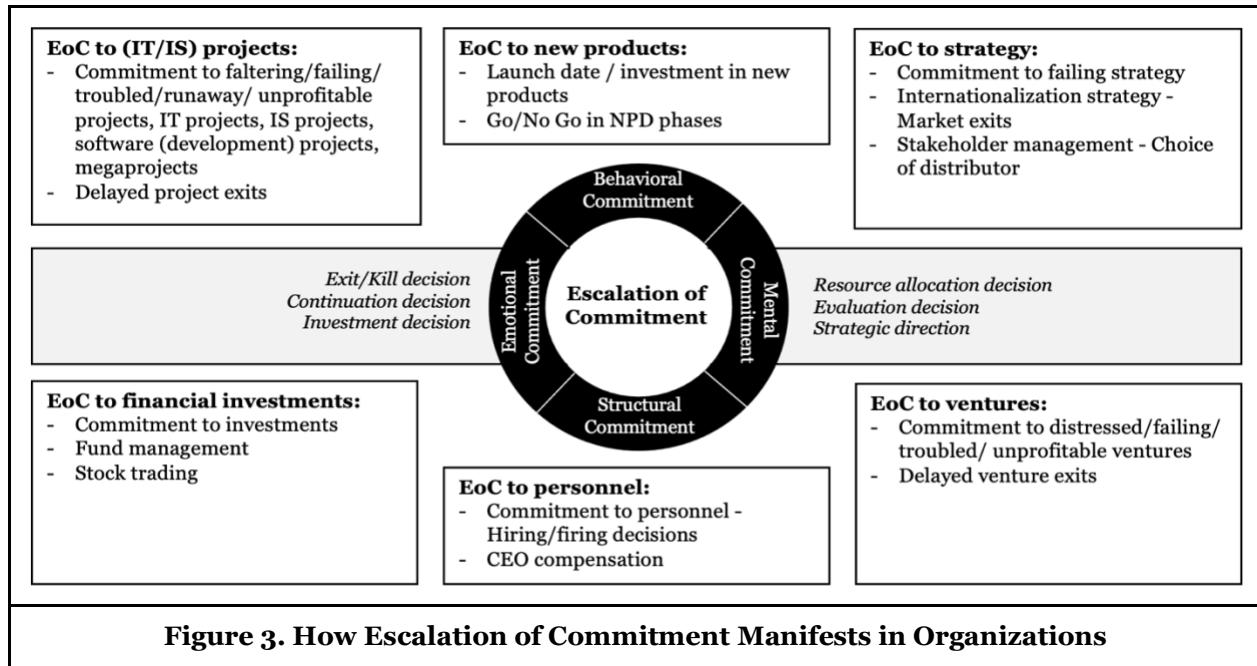
Attributes

Escalation has been defined as continued commitment in the face of negative information about prior resource allocations (Brockner 1992). In line with this early definition and following Staw and Ross (1987), Barton, Duchon, and Dunegan (1989), and Staw (1997), we identified four core attributes characterizing an EoC situation.

The first core attribute of EoC is the element of *continuation*. Here, escalation does not necessarily imply an increasing rate of investment over time, but rather, refers to a growth in the cumulative amount of resources invested over time. Thus, escalation can be thought of as continued commitment. The second attribute of EoC is the presence of *negative information or feedback.* Thirdly, those attributes are paired with the element of "*uncertainty* surrounding the likelihood of goal attainment" (Brockner 1992). That is, decision-makers are not certain that additional investments will be sufficient to bring about goal attainment. Additionally, decision-makers must have a *real choice* in their decision-making about whether to continue. In short, escalation situations include continuation during decision-making in the face of negative feedback about prior resource allocations, uncertainty surrounding the likelihood of goal attainment, and choice about whether to continue.

Dimensions

Our review revealed *behavioral, mental, emotional,* and *structural* commitment as four dimensions of EoC relevant to applying the phenomenon to an ISD project context. In most escalation research, academics have not differentiated behavior and cognition and have typically measured commitment from a behavioral perspective only. *Behavioral commitment* has for instance been defined as the funding recommendation - to invest resources in and pursue a failing course of action (Eliëns et al. 2018). Following Binder (1985) who defined commitment from both behavioral and cognitive perspectives, we conceptualize escalation as having a cognitive dimension (mental or attitudinal escalation) additional to the behavioral component. *Mental commitment* is the establishment of favorable "attitudes" in the minds of the decision-maker towards the failing course of action. Several scholars across disciplines have studied mental commitment. Weeth et al. (2020) for instance, studied the effect of belief structures in the form of departmental thought worlds on EoC. Similarly, Lee et al. (2021) found evidence for the relationship between mindset types and escalating tendencies. Besides behavioral and mental representations of EoC, researchers have pointed out the role of emotions in the context of EoC. *Emotional commitment* can be described as the emotional

attachment developed over time and with increasing investment of resources. Scientists, engineers, and marketers may spend years on an ISD project with their emotional attachment growing over time. Emotional attachment as part of the emotional EoC dimension has been described early on (Staw 1995) and is recently visible in an increasing amount of studies analyzing the role of emotions in escalation tendencies (Huang et al. 2019; Sarangee et al. 2019; Wong et al. 2006). As the fourth dimension of EoC we define *structural commitment*. This dimension refers to the fact that while rooted in individual decision-making processes, EoC can exist in the form of relational and organizational structures that reinforce persistence (Sinha et al. 2012; Tang 1988).

Manifestation in Organizations

Our review of the existing literature has revealed five decision types and six different manifestations of EoC in organizations. The classification gives an overview of *what* decision makers have escalated their commitment to and thereby contributes to a more nuanced conceptualization of our phenomenon of interest.

We have identified five distinct but interrelated decision types where EoC has been observed and studied in the past. The majority of studies investigate *continuation decisions* (43%), where the decision-maker has to decide whether or not to continue a project, a newly developed product, a venture or a professional partnership (Brüggen and Luft 2016; Schmidt et al. 2001). *Exit or "kill" decisions* (17%) are those where the main decision is about termination or full withdrawal. Shutting down a megaproject (Juarez Cornelio et al. 2021) or exiting a distressed venture (Yamakawa and Cardon 2017) are examples belonging to that decision type. The third decision type identified is *investment decisions* (13%). Here the main question is not whether to "kill" or continue a project, but how much decision-makers are willing to continue investing in the failing course of action. Jackson et al. (2018) for instance, specifically looked at the extent of escalating behavior when studying the effect of confidence and anger. Similarly in its non-dichotomous nature, we identified a fourth type of EoC decision within 15% of our sample: *In resource allocation decisions* (Fox and Hoffman 2002; Mayberry et al. 2018; Moon 2001) decision-maker chooses between multiple given options (e.g., projects) to allocate resources, for instance in the form of time, money or personnel. In *evaluation decisions* (Chong and Suryawati 2010; Pan et al. 2006), which we identified in 12% of our studies, usually only one option is evaluated in multiple evaluation categories.

EoC to IT/IS projects is the most dominant theme when looking at areas of application and how EoC has been studied in organizational practice. Here EoC manifests as the commitment to failing, troubled, runaway, or unprofitable projects in general, and to distressed IT, IS, and software development projects, in particular, (Doherty and King 2001; Keil et al. 2000).

As a second theme, we clustered studies that looked at EoC in the context of organizational innovation activities, like the development of *new products* and services. Within this cluster, most studies investigate Go/No Go decisions in innovation phases. In their study about EoC to a failing new product development project Yang et al. (2020) for instance, used the steps in a stage-gate process as context to identify and analyze escalating behavior in management. Similarly, van Oorschot et al. (2011) analyze the decisions of new product development teams and their escalating behavior when committing to new products. Despite looking at EoC in the form of excessive investment of resources, within the area of commitment to new products, time also plays a crucial role. Lee et al. (2018) investigated potential de-escalating strategies for product managers' commitment to the original product launch date when faced with software defects.

While EoC to projects or new products is most researched in IS, management, and psychology literature, there is also a small research stream looking into *EoC to failing strategies*. In their case study, Sinha et al. (2012) observed the severe effects of a CEO`s EoC to his strategic acquisition decision, which caused the organization to persist with a failing acquisition. Other contexts where EoC to a failing strategy has been researched include market exit decisions in the course of a firm's internationalization (Matthyssens and Pauwels 2000) and strategic choices of distributors in stakeholder management (Cox and Walker 1997).

Another theme that emerged, particularly when looking at entrepreneurship outlets, is the *EoC to ventures* in an intra- or entrepreneurial context. Commitment to distressed, unprofitable, and failing *ventures* has been subject to EoC studies both from the perspective of the entrepreneur and the investor. Devigne et al. (2016), for instance, take the perspective of the investor analyzing EoC in venture capital decision-making. Besides investment decisions, also the time to exit a distressed venture can identify EoC (Yamakawa and

Cardon 2017). Other studies take the perspective of the entrepreneur (McCarthy et al. 1993; Nouri 2020) showing how EoC in the context of venture investments or exits manifests in practice.

Grounded in human resource management and top management team research, our review revealed *EoC to personnel* as another way how EoC manifests in organizations (e.g., Sinha et al. 2012). While one of the initial and widely used operationalizations of EoC in experimental studies is the Adams and Smith case developed by Staw (1976), EoC to personnel has emerged as a mature subfield over the past three decades with a recent increase in academic interest based on the publication years in our sample. Studies in this application cluster investigate for instance the consequences of hiring executives EoC to specific personnel (Zorn et al. 2020) and found that entrepreneurial EoC can be explained by the commitment to the family compared to commitment to the venture (Coppens and Knockaert 2021).

As the last theme, we identified *EoC to financial investment*. Decision-makers of studies in this cluster face EoC in the context of organizational investment decisions, for instance in the stock market. Compared to the EoC to ventures theme, those investments are mainly financial. Examples include the study on investment alternatives from Fox et al. (2009), Elfenbein's et al. (2017) experiment on exit delay in the context of equity stakes, and EoC observed with sell-side stock analysts (Beshears and Milkman 2011).

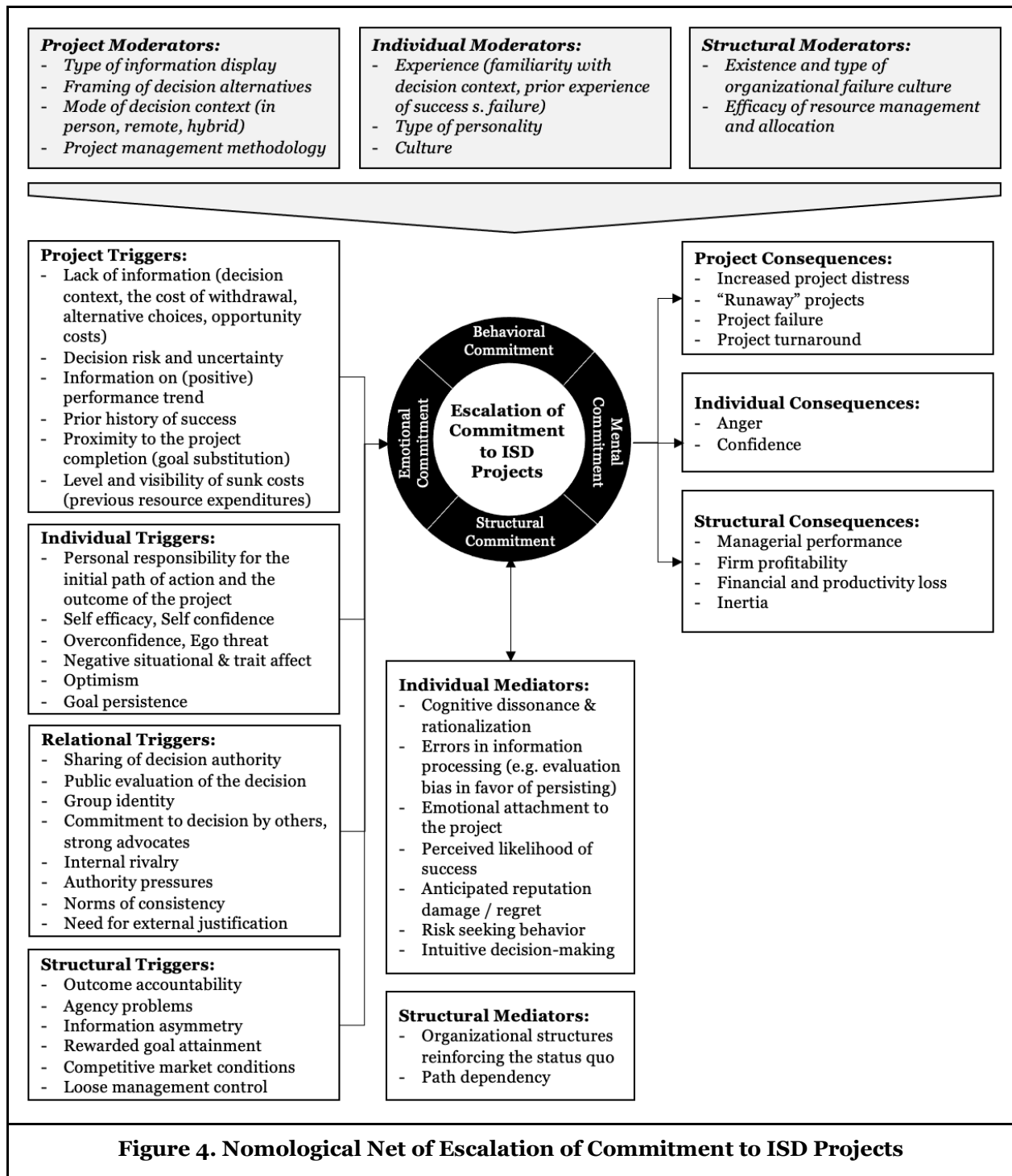## *Nomological Net of Escalation of Commitment to ISD Projects*

In this section, we provide an overview of our synthesis regarding the role of EoC in the context of ISD project distress in general and regarding triggers, moderators, mediators, and consequences of EoC in particular. With this we build on the *how* (relationships with other concepts)*, why* (explanations), and the *who/where/when* (context) of the phenomenon of interest following Whetten (1989).

The Reciprocal Relationship Between EoC and ISD Project Distress

ISD project distress can be seen as a project status of major disturbances that, if not detected, understood, and explicitly addressed can result in project failure. As the constellation of critical problems that lead to a distressed status is usually dynamic, situated, and complex, it is particularly difficult to turn a distressed ISD project into a smoothly running one, hence to "turn it around". However, it is not impossible. We synthesized three main arguments regarding the role of EoC in the specific context of ISD project distress from our review. Firstly, we found that the nature of an already distressed project favors escalating behavior, hence very likely triggering EoC to initial routines. Secondly, EoC functions as a major mechanism that hinders distressed projects from becoming smoothly running projects again. Relying on routines might work with a smoothly running project but pose severe obstacles when the project faces distress. Hence, escalating behavior reinforces the distressed project status. With EoC present, the probability is high that the constellation of critical problems causing the distressing situations are not detected. Similarly, escalating behavior and underlying self-justification processes bias the decision-maker's judgment and understanding of the potentially critical problems. To self-justify prior beliefs or actions, negative signs can stay undetected or misclassified as not critical. EoC is also an obstacle for explicitly addressing the problems once detected and interpreted as it reinforces routines instead of explicit awareness and a change of strategies. While a distressed status paired with the high probability of evoking escalating behavior and the resulting negative effects on properly detecting, understanding and addressing problems likely results in failure, it is still possible to turn a distressed project around. Hence, our third argument derived from the review of EoC literature in the context of ISD projects is about the status-changing potential of de-escalating commitment. For achieving a successful turnaround from a distressed to a smoothly running project the application of de-escalating strategies is promising. Here, it has to be noted that the pure absence of EoC due to the successful application of de-escalating strategies does not automatically lead to a smoothly running project. It can rather be seen as a favorable starting point for managerial action against project distress.

Triggering Factors, Moderators, Mediators, and Consequences

Figure 4 provides an overview of the resulting nomological net of EoC in the context of ISD project distress. We will present every part of the net in detail in the following subsections.

Project Moderators:
- *Type of information display*
- *Framing of decision alternatives*
- *Mode of decision context (in person, remote, hybrid)*
- *Project management methodology*

Individual Moderators:
- *Experience (familiarity with decision context, prior experience of success s. failure)*
- *Type of personality*
- *Culture*

Structural Moderators:
- *Existence and type of organizational failure culture*
- *Efficacy of resource management and allocation*

Project Triggers:
- Lack of information (decision context, the cost of withdrawal, alternative choices, opportunity costs)
- Decision risk and uncertainty
- Information on (positive) performance trend
- Prior history of success
- Proximity to the project completion (goal substitution)
- Level and visibility of sunk costs (previous resource expenditures)

Individual Triggers:
- Personal responsibility for the initial path of action and the outcome of the project
- Self efficacy, Self confidence
- Overconfidence, Ego threat
- Negative situational & trait affect
- Optimism
- Goal persistence

Relational Triggers:
- Sharing of decision authority
- Public evaluation of the decision
- Group identity
- Commitment to decision by others, strong advocates
- Internal rivalry
- Authority pressures
- Norms of consistency
- Need for external justification

Structural Triggers:
- Outcome accountability
- Agency problems
- Information asymmetry
- Rewarded goal attainment
- Competitive market conditions
- Loose management control

Behavioral Commitment

Emotional Commitment

Escalation of Commitment to ISD Projects

Mental Commitment

Structural Commitment

Project Consequences:
- Increased project distress
- "Runaway" projects
- Project failure
- Project turnaround

Individual Consequences:
- Anger
- Confidence

Structural Consequences:
- Managerial performance
- Firm profitability
- Financial and productivity loss
- Inertia

Individual Mediators:
- Cognitive dissonance & rationalization
- Errors in information processing (e.g. evaluation bias in favor of persisting)
- Emotional attachment to the project
- Perceived likelihood of success
- Anticipated reputation damage / regret
- Risk seeking behavior
- Intuitive decision-making

Structural Mediators:
- Organizational structures reinforcing the status quo
- Path dependency

Figure 4. Nomological Net of Escalation of Commitment to ISD Projects

Triggering Factors

Triggering factors answer the *how* and the *why* within Whetten's (1989) building blocks. Staw and Ross (1987) discussed project, psychological, social, and structural determinants that could trigger EoC. Based on the same categories, Sleesman et al. (2012) found in their meta-analytic review what they call a "feast or famine" dilemma with regards to the maturity of research within those four dimensions of determinants.

While project and psychological factors have been intensely studied, social and structural determinants lack investigation. Our analysis of triggering factors confirms that the general "feast or famine" dilemma still exists, even 10 years after Sleesman's et al. (2012) article was published. However, by splitting determinants into triggering factors and escalating actions and conditions we are able to give an updated and more nuanced view of the current research landscape.

Project triggers are the rational components or characteristics of the project and the way this information is displayed. Several studies have found that a *lack of information* regarding choices or alternatives in the form of decision context (Moon et al. 2003), the cost of withdrawal (Schultze et al. 2012), alternative choices (Denison 2009), or opportunity costs (Northcraft and Neale 1986) can accelerate EoC. Here, besides transparency, the availability of information as well as the ability and willingness to process are key elements. Particularly triggering in this context is information on positive performance trends (Brockner et al. 1986), a prior history of success (Bragger 2003), and other factors overrepresenting the potential for future success. With regard to the visibility of information during decision-making also the level of sunk costs (Arkes and Blumer 1985; Fukofuka et al. 2014) for instance in the form of previous expenditures, play an important role in triggering escalating behavior. Further, decision risk and the level of uncertainty have been found to impact EoC (Schaubroeck and Davis 1994) as project-related factors. Moreover, building on the goal completion effect (Boehne and Paese 2000), the proximity of the project completion accelerates EoC (Ting 2011).

As a second category of accelerating factors, we identified *individual trigger*s of EoC. Those triggers induce errors in decision-making due to self-justification and information processing biases. The trigger that has been studied most frequently within this category is the personal responsibility for the initial path of action that evokes EoC to a potentially failing course of action (Brockner et al. 1986; Staw 1976). Besides this individual but situational factor, several characteristics of the decision-maker herself have been found to evoke EoC. Self-efficacy (Liang 2019), self-confidence (Jackson et al. 2018), and overconfidence (Ronay et al. 2017) have been studied as determinants of EoC in various contexts. Ego threat, hence trying to "hold face" in problematic situations, has also been extensively studied as a strong accelerator of EoC (Shi et al. 2021; Zhang and Baumeister 2006). Moreover, general optimism compared to a more pessimistic attitude, as well as goal persistence and achievement striving trigger EoC (Aspinwall and Richter 1999). Besides cognitive processes and characteristics of the decision-maker, the role of emotions has been extensively discussed, especially in psychology research. Here, the majority of studies show triggering effects of negative situational affect and negative trait affect on EoC, in line with self-justification theory. Few studies have started to look into the effects of distinct affective states, looked at the effects of emotion anticipation (Ku 2008; Sarangee et al. 2019; Wong et al. 2006), and started to entangle how emotional and cognitive factors influence the decision-making process in an EoC situation (Tsai and Young 2010).

Similarly centered around the decision-maker, our third category of triggering factors summarizes group-level and relationship-oriented determinants. *Relational triggers of EoC* acknowledge that in an EoC decision scenario the behavior, attitudes, and expectations from others greatly impact the individual processes that lead to EoC, hence acknowledging the role of social factors. Top management team studies, for instance, have found that sharing of decision authority can increase escalating tendency (McNamara et al. 2002). Being publicly committed to an initial decision in front of others makes it harder for decision-makers to withdraw and deviate from their initial course. In this context, public evaluation of decisions and the need for external justification can trigger EoC (Bobocel and Meyer 1994; Steinkühler et al. 2014). Social pressure in the form of authority, internal rivalry, or commitment to the decision by strong advocates triggers commitment to failing projects (Chong and Syarifuddin 2010). Also, a strong group identity and general norms of consistency imposed by the social environment can accelerate EoC (Huang et al. 2019).

Finally, *structural triggers* center on characteristics of the organization and the organization's environment that can reinforce the tendency to persist. Structural triggers may include reward systems - Moser et al. (2020) found that outcome accountability compared to process accountability triggers EoC- and agency problems that make decision-makers act in a self-interested way escalating on the expense of their organization (Booth and Schulz 2004). Related to agency problems, Chong and Suryawati (2010) found that project managers will discontinue an unprofitable project in the presence rather than absence of monitoring control. Moreover, information asymmetry between decision-makers and key stakeholders has been identified as a structural trigger that can lead to EoC (Berg et al. 2009). Bridging escalation behavior

literature and competitive dynamics research, EoC has been found to be triggered by competitive market conditions (Hsieh et al. 2015).

Consequences

As part of this section, we introduce our synthesis of EoC consequences that have been studied in IS, management, and psychology literature. Similar to triggering factors, we cluster the identified consequences into project, individual, and structural consequences. Within our dataset, we have not found studies focusing on the impact of EoC on relational factors. As for *project consequences,* we have identified increased project distress, runaway projects, and project failure. While EoC, when confronted with adequate de-escalation strategies, could potentially lead to project success, the "positive" consequences of EoC are under-researched in current literature. Exceptions are studies investigating how EoC can eventually lead to project turnaround (Lee et al. 2018; Mähring et al. 2008). *Individual consequences* include emotions like anger and frustration triggered by EoC (Jackson et al. 2018). Interestingly Jackson et al. (2018) found within the same study that the relationship can be regarded as reciprocal, where EoC also increases the confidence of the decision-maker. *Structural consequences* of EoC are declining managerial performance and firm profitability, financial and productivity loss, and organizational inertia (Fox and Hoffman 2002; Hsieh et al. 2015).

Moderators and Mediators

As part of this section, we introduce factors that moderate between EoC and potential consequences, as well as between the presented triggers and EoC. Moreover, we will present mediators discussed in the literature that may explain the underlying mechanisms of why decision-makers escalate their commitment. Investigating moderators and mediators is particularly interesting when looking at EoC in the context of ISD project distress, as one crucial goal of project distress literature is to identify mechanisms and conditions that might lead to a turnaround of the distressed project.
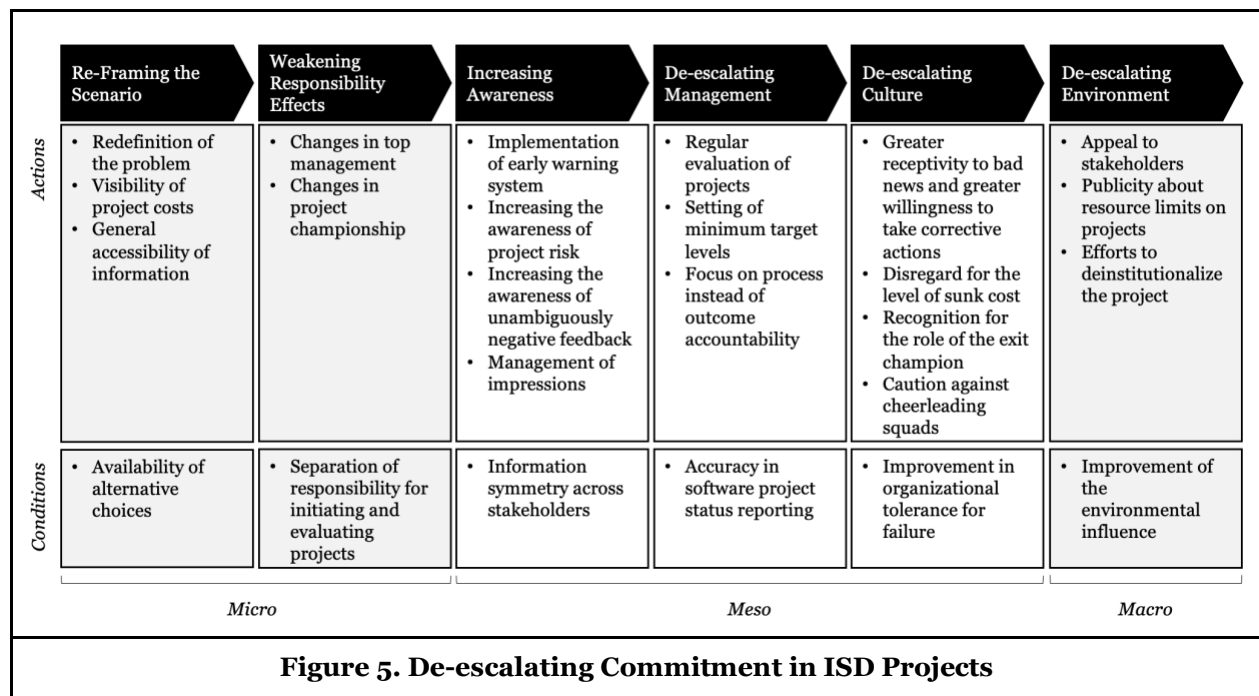
Project moderators that we could identify in existing literature include the type and form of information display and the framing of the decision alternatives (Davis and Bobko 1986; Schoorman and Champagne 1994). The importance of the form of information display has for instance been shown by Behrens et al. (2014), who found that the effect of personal responsibility in EoC behavior is accelerated when the information about the project is based on text compared to when it's visualized with graphs. Also related to the project moderators, Schmidt et al. (2001) found that virtual teams are less prone to EoC than individuals and face-to-face teams. We further found that the type of project management methodology (agile, waterfall, etc.) used can influence the effect between triggering factors and escalating tendencies. For instance, existing literature indicates that agile projects are more prone to escalation situations. Using the case of former handset maker Sony Ericson, Klingebiel and Esser (2020) support this view by revealing how innovation projects can escalate through a stage-gate process that is meant to minimize initial commitment. *Individual moderators* that influence the EoC effect include the experience of the decision-maker regarding the decision context and prior experience of success or failure (Bragger et al. 2003). Moreover, the type of personality and other characteristics have been found to moderate the EoC effect (Schaubroeck and Williams 1993). Besides ability, experience, and personality-related factors, also the cultural context of the decision-maker moderates the effect of triggering factors on EoC behavior. Gomez et al. (2013) published one of the few studies looking into cultural moderating effects within the EoC literature, showing that information framing leads to opposite effects among managers with different cultural origins (Mexico vs. USA). Under *Structural moderators,* we classify those factors that relate to the organization or the environment in which the EoC effect emerges. A crucial structural factor is an organizational culture, including the organization's tolerance towards failure and factors accelerating social pressure. Moreover, the efficacy of resource management and allocation moderates the EoC effect (Henderson et al. 2007).

While in general, the *mediating effects* of relevant variables on EoC have been relatively under-examined by extant academic literature, we could identify nine mediators that are related to individual and structural factors in existing literature. Contributing to the list of *individual mediators*, Schultze et al. (2012) identified evaluation bias in favor of persisting. We categorized the evaluation bias as part of general errors in information processing that may mediate the emergence of the EoC effect. Moreover, we found cognitive dissonance – the mental discomfort resulting from the perception of contradicting thoughts, beliefs, or attitudes (Festinger, 1962) - and processes of cognitive rationalization where pertinent cognitions are

modified or inferred in relation to a conflicting behavior (Beauvois and Joule, 1982) as potential mediators. Related to our emotional dimension of EoC, we further identified emotional attachment to the project as an individual mediator. Adding to this, Bonney et al. (2014) found that the escalating triggers increase the perceived likelihood of success and thereby encourage EoC to the failing course of action. Pointing to a similar direction, several studies have analyzed how anticipated reputation damage and regret cause escalating behavior. Also, the role of decision-making styles, for instance evoked by framing, has been analyzed for its mediating potential. Moreover, Eliens (2018) found that intuitive decision-making is a mediator for EoC. Besides cognitive and emotional mechanisms, behavioral mediators have been studied by the EoC literature. In this context, risk seeking behavior has been introduced as a potential underlying mechanism that can explain the effect of project-specific triggers on escalating behavior in decision-making. *Structural mediators* include organizational structures that are created by structural triggers like information asymmetry and reward systems. Those triggers reinforce the status quo (Berg et al. 2009; Hsieh et al. 2015) and general path dependency, where organizations move through developmental phases which can possibly end up in lock-in (Sydow 2009). Based on our frequency analysis we found that compared to individual mediators, structural mediators are under-examined in current EoC literature.

De-escalation

Based on the synthesis of triggering factors, moderators and underlying mechanisms we have developed a theoretical model of ISD project de-escalation. Figure 5 gives an overview of the actions and conditions that have the potential to turn ISD project distress into success. We grouped de-escalating strategies by their type in actions and conditions and by their level into micro, meso, and macro.

	Re-Framing the Scenario	Weakening Responsibility Effects	Increasing Awareness	De-escalating Management	De-escalating Culture	De-escalating Environment
Actions	• Redefinition of the problem • Visibility of project costs • General accessibility of information	• Changes in top management • Changes in project championship	• Implementation of early warning system • Increasing the awareness of project risk • Increasing the awareness of unambiguously negative feedback • Management of impressions	• Regular evaluation of projects • Setting of minimum target levels • Focus on process instead of outcome accountability	• Greater receptivity to bad news and greater willingness to take corrective actions • Disregard for the level of sunk cost • Recognition for the role of the exit champion • Caution against cheerleading squads	• Appeal to stakeholders • Publicity about resource limits on projects • Efforts to deinstitutionalize the project
Conditions	• Availability of alternative choices	• Separation of responsibility for initiating and evaluating projects	• Information symmetry across stakeholders	• Accuracy in software project status reporting	• Improvement in organizational tolerance for failure	• Improvement of the environmental influence
	Micro			*Meso*		*Macro*

Figure 5. De-escalating Commitment in ISD Projects

On the *micro level*, EOC can be de-escalated by *re-framing the decision scenario*, for instance by redefining the problem using framing, adapting the visibility of project costs in particular, and increasing the accessibility to information in general. Additional emphasis on the project costs, for instance in the form of specific project tracking tools, can help the decision-maker to recognize the easily omitted future downsides of continuing a distressed project. Moreover, the availability of alternative choices is a favorable condition that may de-escalate commitment to failing ISD projects. Here, the decision-maker does not have to decide against a certain project or initial decision but for an alternative. This resulting change in framing can reduce cognitive dissonance and ease the decision-making process by helping the decision-maker to (self)justify deciding against an initial course of action. Another area of action that can be implemented on the micro-level is *weakening the responsibility effects*. Our analysis of triggering factors has revealed the

key role of personal responsibility. Changes in the top management team or changes in the project championship are actions that can help to de-escalate upcoming commitment due to the separation of responsibility. Similarly, the project conditions should include a separation of responsibility for initiating an evaluation of the project to further de-escalate commitment.

On the *meso level*, increasing awareness, de-escalating management, and a de-escalating culture can contribute to de-escalating commitment in ISD projects. *Increased awareness* is related to the importance of project-related triggering factors and potential resulting errors in information processing that can lead to EoC. Implementing an early warning system, increasing the awareness of project risks and unambiguously negative feedback, as well as managing impressions when it comes to social pressure are de-escalating actions. While Information asymmetry may trigger or reinforce EoC, we suggest information symmetry across stakeholders as a favorable organizational condition to de-escalate commitment in ISD projects. *De-escalating management* actions include the regular evaluation of projects, setting up minimum target levels, and focusing on process instead of outcome accountability. An additionally accurate project status reporting can accelerate de-escalating forces and help turn around a distressed ISD project. Those managerial actions work by helping the decision-maker recognize the potentially omitted future costs and other downsides of continuing a distressed project. Related to the presented structural triggering and moderating influences on EoC, a *de-escalating organizational culture* can have a great impact on the direction an EoC situation may take. Actions include greater receptivity to news and fostering the willingness to take corrective actions within the organization. Further training to disregard the level of sunk costs can help to de-escalate commitment in this context. Other de-escalating actions include acknowledging the role of the "exit champion" and being cautious regarding homogenous opinions in groups. Here, a general condition for managers interested in de-escalating commitment in their organization is to improve the organizational tolerance for failure. This tolerance can change the way decision-makers anticipate the consequences of stopping or changing distressed projects and thereby de-escalates their commitment.

While the previous approaches to reduce EoC mainly focused on the decision environment, e.g., reducing the responsibility of the decision-maker or reducing the probability of negative outcomes, on the *macro level,* we have identified a *de-escalating environment* as a strategy to protect distressed ISD projects EoC. Actions include an appeal to stakeholders, making resource limits public, and thereby using social pressure effects in favor of de-escalation. Moreover, efforts to deinstitutionalize the project can help to de-escalate commitment.

Conclusion & Limitations

While EoC is a core barrier within the process of turning around distressed ISD projects, current research has only started to better understand EoC in this context. Coming back to our research question, this review intended to investigate the phenomenon of EoC in the context of ISD project distress based on existing interdisciplinary research. We conducted a structured literature review and presented a synthesis of the conceptualization of EoC in ISD projects including attributes, dimensions, and manifestations of EoC in organizations. Based on the conceptualization, we presented a nomological net of EoC in ISD projects including its relation with triggering factors, consequences of EoC, and moderators and mediators. In the last step, we transferred the knowledge gained from the nomological net into a set of de-escalation strategies, which can be tested by researchers and applied by practitioners. Integrating the status quo on explanations, triggers, mechanisms, and contextual variables leads to a better understanding of what fuels distressed projects turning into failure and eventually helps to develop de-escalation strategies. Moreover, the review adds important knowledge to ISD failure literature by explicitly addressing emerging problems during ISD projects and also identifying different mechanisms by which unsuccessful coping with the emerging problems fuels escalation.

We acknowledge that our review is subject to limitations. While our analysis strategy allowed us to combine depth with a comparatively large dataset, the strategy may lead to committing valuable information. Moreover, while our proposed net provides an overview of what has been done in the past on EoC in the context of ISD projects, it does not contain details on specific relationships among concepts within our clusters. Nevertheless, our review contributes to current academic debates in IS by connecting the matured but fragmented body of EoC research from psychology and management with a highly topical context for

IS researchers and practitioners. Our proposed nomological net as well as the set of de-escalation strategies can serve as an inspiration and foundation for future IS researchers. By presenting this review we hope to inform future IS research to acknowledge the role of EoC in ISD projects.

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