Software Project Risk Drivers as Project Manager Stressors and Coping Resources
Suzanne Rivard
HEC Montréal
suzanne.rivard@hec.ca
Yannik St-James
HEC Montréal
yannik.st-james@hec.ca
Ann-Frances Cameron
HEC Montréal
ann-frances.cameron@hec.ca

Abstract
 Although the stressful nature of high risk exposure software projects and the adverse repercussions of stress on project participants and performance have long been recognized, there is still little research on the subject. This paper builds upon two foundations – the cognitive-transactional theory of stress and the concept of software project risk exposure – to propose a model of software project risk drivers as software project manager stressors and coping resources. The model posits that some software project risk drivers – core project characteristics and project objectives – play the role of stressors and that other risk drivers – project environment characteristics – play the role of coping resources. The model further suggests that software project managers are faced with both chronic stress and acute stress, which have different antecedents. This paper broadens current understanding of the role of software project risk drivers; it also contributes to knowledge on software project management by focusing on the emotional components this activity.

1. Introduction

Projects have become an important structure for accomplishing organizational goals [37] and have been widely employed in the software domain – be it the development of an information system or the configuration of a software package such as an enterprise system. Industry reports reveal, however, that software projects still have a high failure rate suggesting that further study may be required. Most of the research on and practice of software project management relies on defined methods of planning and control portraying project managers as rational actors who make decisions in order to maximize efficiency and effectiveness [2]. In this view, software project management is a set of “management controls needed to impose discipline and coordinate action to ensure goals are met” [26: 159].

There are some indications, however, that software project managers do not always approach project management in an analytic, efficiency-seeking way and may not always follow the techniques and tools prescribed in their training and in the literature. For instance, Bernier and Rivard [7] suggest that habitualized action may play a role in software project managers’ choice of project management mechanisms. In addition, Barki et al. [4], and Nidumolu [25] found that software project managers did not react as hypothesized in their theoretical models based on contingency theory. These studies suggested that software project managers had “a rather narrow view of a software development project, not devoting due attention to several of its dimensions, or not reacting adequately to certain situations” [4: 14]. A recent study involving a simulated project management game found that experienced project managers made the same mistakes as novices [35]. The study found that experienced project managers did not adapt their management approach to the degree of complexity of the problem. Instead, they chose courses of action that ran counter to what they stated one ought to do under such circumstances.

These findings suggest the use of alternate perspectives to study software project management; in particular, researchers have called to recognize the existence of emotional components in software project management [32]. Espousing a similar view, a number of studies have adopted a stress perspective to analyse project management in different settings, such as construction projects [24, 38] and R&D projects [8]. Research has also investigated stress in the IS context, including the occupational stress of IS professionals [29, 36, 39] as well as the stress of organizational employees using information technology [30].

Based on the assumption that software project management is inherently stressful, some researchers have adopted a stress perspective to analyse software project management. These studies interpreted some project managers’ behaviors, such as seeking social support, adding resources, avoidance, alcohol consumption and overeating as ways of coping with the stress involved in the project [31]. In addition to coping strategies, these studies also focus on identifying the stressors and outcomes that are relevant to software project management. For instance, incidents related to resource availability – or lack thereof – and to changes in project priorities are deemed stressful for software project managers [14].
Also, stressors of a more general nature – such as work overload, too much responsibility and uncertainty – have been identified [31].

Stress among IT professionals is associated with many negative effects, from loss of productivity to employee turnover, leading to significant costs for organizations [36]. It has been argued that it is the stressful nature of software projects and the adverse impact of stress on project participants which are responsible for many of the problems encountered in software projects [42]. When stress is experienced by a project’s manager, the impacts are felt not only at a personal level, but they can ripple down to the project team and ultimately affect the project’s outcome.

Given the pervasiveness of stress in software project management and its negative individual and organizational consequences, there is a surprising paucity of research examining this phenomenon. Although a number of researchers are interested in stress in the IS context – such as end-user technostress [10, 30], stress experienced by the users participating in system development [43] and the effect of occupational stress on IS professionals [36, 39] – our literature review yielded only two studies that adopted a stress perspective to study IS project managers [14, 31]. Notwithstanding the contributions of these two studies, they leave a gap in our understanding of how stress emerges in a software project management context. First, the stressors these studies identified are sometimes quite general and are not directly related to the characteristics of the software project (for example, work overload, too much responsibility and uncertainty in [31]). Second, the studies did not attempt to explain the process by which a given antecedent influences the level of stress experienced by the software project manager.

This paper will attempt to fill this gap by focusing on the antecedents of software project manager’s stress that are directly related to characteristics of the software project and on the process by which the antecedents influence the level of stress. More precisely, adopting the cognitive-transactional theory of stress [21] and the notion of software project risk exposure [4, 5, 9], we theorize on the role of software project risk drivers as antecedents of stress, that is, as either stressors or coping resources. We further suggest that software project managers are faced with two types of stress, chronic stress and acute stress, and that the nature of the antecedents differ according to the type of stress.

We thus contribute to the literature on software project management on two fronts. First, we broaden our understanding of software project risk factors by conceptualizing them as antecedents to stress and, more specifically, by analyzing their role as either stressors or coping resources. Second, we extend the literature on IS project managers and stress through the identification of project-specific stressors, the distinction between chronic and acute stressors, and the development of a theoretically-based interpretation of the process through which stress arises.

The paper is organized as follows. We first present the conceptual background for our model: the notions of software project risk exposure and software project risk drivers and the cognitive-transactional theory of stress. This is followed by our theorization of software project risk drivers as stressors and coping resources.

2. Background

2.1. Software project risk drivers

The term risk is used in a variety of domains, and takes a variety of meanings. Some refer to risk as the probability of occurrence of an undesirable event – such as the risk of an earthquake – while others conceptualize risk as the loss associated to the occurrence of an undesirable event – such as the risk of dying would an earthquake occur. The present study adopts the concept of risk exposure, which takes into account both the probability of occurrence of undesirable events and the loss associated with those events. In the context of software projects, risk exposure has been defined as follows:

\[ RE = \sum P(UOi) \times L(UOi) \]

with \( P(UOi) \) the probability of the undesirable project outcome \( i \), and \( L(UOi) \) the loss associated with the undesirable project outcome \( i \) [9].

In a software project, undesirable outcomes are deviations from project objectives [6, 17], some of which are associated with the process of developing or implementing a system, while others are related to the product that results from this process [25]. Process objectives include on-time and within budget system delivery while product objectives mainly refer to the technical quality of the system being delivered [5, 17]. As per the definition of risk exposure, the overall risk exposure of a software project that has three objectives – e.g. technical quality, on-time and within budget delivery – is the sum of the expected loss due to a deviation from each of the three objectives.

Estimating risk exposure implies assessing the loss associated with a deviation from each of the project’s objectives and the probability of occurrence of each of these undesirable outcomes. The loss associated with an undesirable outcome is generally assessed with perceptual measures [5, 41]. The probability of occurrence of a given undesirable outcome is estimated by assessing the attributes of the project – also called risk factors – that contribute to increasing the probability of occurrence of the outcome [5, 17].
In this study, we refer to undesirable outcomes and risk factors as risk drivers.

The software project literature has proposed several lists of risk factors – see Table 1 – going from project size to lack of organizational support, and including technological newness and team’s lack of expertise. An examination of these risk factors led us to group them within two broad categories: core project characteristics and project environment characteristics. As shown in Table 1, core project characteristics risk factors correspond to attributes of the project. They include project size, the newness of the technology that will be implemented or used to develop the target system, as well as the complexity of the software and of the processes that it is to support.

<table>
<thead>
<tr>
<th>Risk driver category</th>
<th>Risk driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core project characteristics</td>
<td>• Project size [5, 6, 20]</td>
</tr>
<tr>
<td></td>
<td>• Technological newness [5, 6, 20]</td>
</tr>
<tr>
<td></td>
<td>• Application complexity [5, 6, 20, 41]</td>
</tr>
<tr>
<td>Project environment characteristics</td>
<td>• Lack of team expertise [3, 6, 17, 20]</td>
</tr>
<tr>
<td></td>
<td>• Lack of user support [3, 6, 17, 20, 41]</td>
</tr>
<tr>
<td></td>
<td>• Lack of organizational support [3, 6, 17, 20, 41]</td>
</tr>
</tbody>
</table>

2.2. The cognitive-transactional theory of stress

There are three broad approaches to the study of stress. The response-based perspective [34] emanates from biomedical sciences and distinguishes between a stressor (the stimulus) and stress (the response) while focusing on physical responses and the development of illness. In contrast, the stimulus-based perspective [19] emphasizes the particular characteristics of the stressor and seeks to establish relationships between a variety of distinct stressors and outcomes. Finally, the dominant paradigm in the psychology field – the cognitive-transactional theory of stress [21] – posits that it is the stimulus-response relationship that defines stress, not the stimulus or the response. This theory has been most influential, with tens of thousands of studies drawing on its contextualized approach to studying stress and coping [13]. Formally, this approach defines stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” [13: 19].

According to Lazarus and Folkman [21], the appraisal process involves categorizing an event and its various facets with respect to its significance for well-being. The researchers further distinguish between primary appraisal and secondary appraisal. Primary appraisal addresses the significance of an outcome for the person’s perceived well-being and includes two elements: goal relevance and goal congruence. Goal relevance refers to the importance of an event or outcome for the person, whereas goal congruence concerns an individual’s evaluation of the compatibility of an event or outcome with his or her needs and wants. Stress arises when an event is appraised as having high goal relevance and low goal congruence. Secondary appraisal assesses the person’s ability to cope with the consequences of an event; it is comprised of accountability, coping potential, and future expectancy. Accountability pertains to the attribution of blame for an event. Coping potential corresponds to one’s ability to reconcile one’s actual state and one’s desired state. Future expectancy refers to the evaluation of an event’s congruence with the person’s goals in the future. Events are more stressful when they are assessed as incongruent with the person’s goals in the future and when coping potential is low.

Secondary appraisal is affected by the coping resources available. These resources include physical resources (e.g., health and energy), psychological resources (e.g., personality traits, positive beliefs, problem-solving skills), social resources (e.g., interpersonal network, social support), and material resources [21, 27]. Greater resource endowment...
equips the person with the means of handling a situation and thus reduces its ultimate threat to well-being; all things being equal, an event will be appraised as less stressful when a person possesses sufficient coping resources.

Although the word stress usually has negative connotations, recent research recognizes that not all stress is inherently negative and suggests that both positive and negative emotions can “co-occur” throughout the stress process [13: 747]. For example, hindrance stressors have been proposed as events that “people tend to appraise as potentially constraining their personal development and work-related accomplishment” [28: 438] and are associated with negative emotions. In contrast, challenge stressors are those that people “tend to appraise as potentially promoting their personal growth and achievement” [28: 438] and evoke positive emotions.

In sum, stress arises from a person’s appraisal, on one hand, that a situation entails potential or actual negative consequences for his or her well-being and, on the other hand, that the demands of the situation exceed the resources available to him or her for handling it. Although stress emerges from an individual’s assessment of the personal significance of the relationship between his situation and characteristics of the environment, certain properties of a situation can create the potential for threat, harm, or challenge [21]; these properties are presented in Table 2.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novelty</td>
<td>Situation that the person has not previously experienced. To elicit stress, there must be an existing association with harm, danger or challenge.</td>
</tr>
<tr>
<td>Predictability</td>
<td>Unpredictable situations – those in which established expectancies are no longer met – are deemed more stressful.</td>
</tr>
<tr>
<td>Event uncertainty</td>
<td>Subjective or objective likelihood or probability of an event’s occurrence.</td>
</tr>
<tr>
<td>Imminence</td>
<td>The period of anticipation before an event occurs.</td>
</tr>
<tr>
<td>Duration</td>
<td>The length of an event. Events of a long duration will be deemed more stressful than those of a short duration.</td>
</tr>
<tr>
<td>Temporal uncertainty</td>
<td>Situation where the individual knows that an event will definitely happen but is unsure of the precise timing.</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>Situation where the information needed for appraisal is unclear or insufficient resulting from a lack of situational clarity.</td>
</tr>
<tr>
<td>Timing of events in relation to the life cycle</td>
<td>Events occurring at the same time as other stressful events in the individual’s life cycle may be appraised in relation to these other events.</td>
</tr>
</tbody>
</table>

Among these properties, the temporal dimension has long been recognized as one of the most important parameters of stressful situations [23]. On the basis of an event’s duration, Wheaton [44] distinguishes between acute stressors and chronic stressors. Acute stressors are discrete, observable events, with clear beginning and end points and a relatively well defined process. In contrast, chronic stressors are “problems and issues that are either so regular in the enactment of daily roles and activities, or so defined by the nature of daily role enactments or activities, that they behave as if they are continuous for the individual” [44: 82]. Figure 1 depicts acute and chronic stressors.

Acute and chronic stressors are related in a number of ways. For instance, isolated stressful events can lead to a prolonged course of stress or chronic stress can be punctuated by acutely stressful events. Similarly, having to cope with ongoing chronic stress may affect a person’s experience of and ability to cope with a sudden, short-term stressor [15].

Distinguishing between acute and chronic stressors broadens our understanding of stressors beyond the standard conceptualization that stress arises from an “event” and compels us to consider how ongoing situations or conditions may lead to stress [44]. We argue that this distinction is particularly important in making sense of stress in the context of software project management where chronic stress is associated with the overall configuration of a project’s objectives and core characteristics whereas acute stress may emerge when there is a sudden, unexpected change in these factors or in the project managers’ ability to explain and influence progress towards objectives. These relationships are examined next.

3. Software project risk drivers as stressors and coping resources

Our model suggests that some project risk drivers play the role of stressors for a software project
manager, while others play the role of coping resources (see Figure 2). Because it focuses on software project risk drivers, our explanation excludes stressors of a more general nature, such as job insecurity, reputation and conflicts that have been proposed in the literature [31]. Similarly, it excludes coping resources such as personality type, locus of control or growth need strength [43]. Instead, we focus on the role that the project’s objectives and core characteristics – including project size and scope, technological newness and application complexity – play as stressors. We also suggest that project managers assess the risk drivers that are characteristics of the project environment, such as their own and their team expertise and organizational environment, as coping resources rather than as stressors. We further propose that a software project entails two types of

![Figure 1: Acute and Chronic Stressors](source: Wheaton [44])

---

**Figure 1: Acute and Chronic Stressors**

---

**Chronic stressors**
- Task demands overload
- Goal conflict

**Acute stressors**
- Change in task requirements
- Loss of control

---

![Figure 2. Software Project Risk Drivers as Stressors and Coping Resources](adapted from Lazarus and Folkman [21])

---

**Figure 2. Software Project Risk Drivers as Stressors and Coping Resources**
stress for project managers – chronic stress and acute stress – and that each type of stress is induced by events of different nature. The events that induce chronic stress emerge under particular combinations of software project risk drivers, while the events that induce acute stress are discrete events.

3.1. Chronic stress

A situation of chronic stress is a circumstance of “continuing hardship” and “unremitting demands” [15: 4]. We suggest that there exist two major chronic stressors in a software project: task demands overload and goal conflict.

3.1.1. Task demands overload. Task demands overload is considered one of the most important antecedents of chronic stress: “There is simply too much to do, and the person feels pulled by multiple, independent, immediate, and uncontrollable demands that cannot be put aside” [44: 58]. In a software project, the demands of the task are determined by the core project characteristics: project size and scope, technological newness and application complexity.

The cognitive-transactional theory of stress suggests that project managers conduct a primary appraisal of these requirements, considering their significance in their particular project. If the demands of the task are significant, however, the project manager does not automatically perceive a high level of stress. This is because in addition to the primary appraisal, the project manager performs a secondary appraisal where the requirements of the task are assessed in view of the resources available. If the project manager thinks that the resources will be sufficient to meet the task requirements, no negative emotions will develop. If the project manager concludes that the resources will not suffice to perform the task, the project will be deemed stressful.

For example, a very large project that involves numerous users and multiple subsystems, technology that has never been used before and very complex business processes might be deemed stressful because of the magnitude of its demands. It is not the complete picture, however. The cognitive-transactional theory of stress suggests that stress is not likely to arise if the project manager perceives that the necessary resources are available. We theorize that the risk drivers that are project environment characteristics act as coping resources. In fact, these risk drivers point to a lack of a particular coping resource. In the software project risk literature these risk drivers are referred to as lack of team expertise, lack of user support and lack of organizational support [3, 41]. They include elements such as the lack of stability of the organizational environment and of the management structure, negative user attitude toward the system under development, lack of cooperation from the users, lack of top management support, inadequately trained team members, lack of experience of the project leader with project management, and so on.

We suggest that rather than being assessed along with the core project characteristics to determine the magnitude of the task demands, the project environment characteristics will be assessed in terms of their potential as coping resources. In other words, we suggest that the project manager will assess the flip side of these risk drivers and will appraise them – e.g. an expert and experienced team, enthusiastic users and supportive top management – as potential coping resources. Whether or not the project manager deems the project stressful will depend on this appraisal.

In conceptualizing core project characteristics as stressors and project environment characteristics as potential coping resources, our model adopts a perspective that is similar to the Job Demands-Resources (JDR) model proposed by Demerouti et al. [12]. Indeed, the JDR model posits that job demands, which refer to the “social, physical and organizational aspects of the job that require sustained physical or mental effort” (p. 501) will increase the strain that a person feels from his/her job [11]. The model further suggests that a person’s work environment also includes job resources, which are physical, psychological, social or organizational aspects of a job that can reduce job demands or reduce the effect of job demands on the degree of strain a person experiences.

3.1.2. Goal conflict. A potential stressor arises when there is a disjunction between goals and means to achieve goals [44]. This is particularly relevant in a software project context as most of these projects have multiple objectives. It is often the software project managers’ responsibility to ensure that these multiple and sometimes conflicting objectives are reached [18]. Some authors have referred to two broad categories of software project objectives, product-related objectives and process-related objectives [5, 25, 41]. The product-related objectives pertain to the information system that has to be delivered. They include the technical quality of the software (e.g. reliability and maintainability), its functionality (meeting user requirements) and its ability to support the new business processes that the organization aims to introduce with the new system. Process-related objectives pertain to the extent to which the software is delivered on time and within budget. Above and beyond these operational objectives, a software project also has an overarching objective, that is, the business goal that the software, once implemented, is expected to help achieve. It has been suggested that these multiple objectives are sometimes incompatible [18, 22] and attempting to pursue multiple objectives can
lead to “cascading problems that put undue pressure on implementation teams” [40: 4].

Based on the cognitive-transactional theory of coping, we posit that project managers assess the relevance of each goal and the congruence among the multiple goals. A situation where relevance for all goals is high and goal congruence is low will potentially be conducive to a high level of stress. This would be the case, for instance of a software project that has a tight budget and a tight schedule and for which top management has high expectations in terms of functionality.

Project managers, however, also conduct a secondary appraisal, that is influenced by assessing the coping resources available to them. As described above, these resources are related to the core project environment characteristics, that is, team expertise, user support and organizational support.

For example, software projects where there is pressure to deliver a high-quality system in a short amount of time and within a tight budget would be potentially stressful to project managers. However, we suggest that project managers are less likely to feel stressed if they perceive that the organizational environment is favourable. This includes the support of strong top managers who will endorse their decisions of what trade-offs to make when pursuing these multiple goals and provide necessary resources, a highly qualified team who can handle the challenges inherent in pursuing multiple objectives, as well as users who are enthusiastic about the new processes and new system.

3.2. Acute stress

Acute stress is associated with “short-term events and transitions that have clearly demarcated time spans” [15: 3]. Although any software project is replete with “issues [that] will pop up” [31: 8], we suggest that these issues fall into two broad categories of acute stressors: loss of control and changes in the task requirements.

3.2.1. Loss of control. Perceived control describes an individual’s belief regarding the degree to which an event is explainable, predictable, and subject to influence [16]. Perceived control is recognized as a basic human need [45] and an important motivation factor in an organizational context [16]. Research indicates that a decrease in control is a source of stress [1].

We propose that loss of control may constitute a potent source of stress for software project managers. Indeed, planning and control play an important role in software project management [33]: Software project managers – or the project office – carefully plan project activities, prepare Gantt charts, and conduct careful estimations of project duration and cost. Project managers are also responsible for monitoring progress and they are held accountable for meeting objectives and deadlines. Over the course of a project, events may occur that had not been predicted and that are difficult to explain. We suggest that these events may lead to a perceived loss of control that will be appraised as stressful if they cannot be directly addressed with the project manager’s coping resources.

Such would be the case, for instance, when a project manager receives a periodical report that contains unexpected results about the advancement of a multiple-module ERP implementation. This could, be in terms of cost, earned value, number of objects produced over a period of time or even absenteeism. Let us assume that in addition of having been unpredictable, such a result is unexplainable, that is, even after analysis and enquiries, the project manager does not find an explanation to increased absenteeism or much higher than expected costs. Such a situation is potentially conducive to stress, if the project manager deems its consequences as significant and the coping resources insufficient.

Here again, we posit that the project environment characteristics are key coping resources in a project manager’s appraisal of loss of control as stressful: The more responsibility and accountability are ascribed to the project manager alone, the more stressful loss of control will be. If, the project does not have strong top management support and its team does not have expertise in the problematic area where the loss of control occurred, the project manager is likely to deem the situation stressful. Alternatively, shared responsibility for project success should reduce the significance of the perceived loss of control, which would then be less stressful.

3.2.2. Change in task requirements. When an individual’s established expectancy of the situation is no longer met, loss of predictability occurs and the situation may become a source of stress [21].

It has long been recognized that software projects take place in an ever changing environment. Changes in task requirements include user requirements that change over the course of a project, a change in the go-live date or a change in the technology. We suggest that events that modify the task requirements – determined by the core project characteristics of project size and scope, technological newness and application complexity – play the role of acute stressors because they disrupt a project manager’s expectations. Consider for instance a project originally aimed at modifying the business processes of a single division of a pharmaceutical firm that operates in several countries. During the course of the project, a
strategic decision is made by top management that the project will now include all the business divisions and they will all have to implement the new business processes and supporting technology that are currently under development. As per the cognitive-transactional theory, such a change will be appraised as significant. Whether the change will actually be a stressor will be determined by secondary appraisal, as the project manager assesses the new requirements in view of the resources available. If the new requirements call for resources that are not currently available within the project environment, the event will be deemed stressful.

4. Discussion and conclusion

Software projects possess many properties of stressful situations: their outcome is often difficult to predict, many unpredictable events can occur during their course, they often take place over long periods of time and software project managers often have to deal with ambiguity. Because stress experienced by project managers can have negative individual and organizational impacts, this paper attempts to understand how software project risk drivers come into play as antecedents of stress for project managers. Drawing on the concept of software project risk exposure and on the cognitive-transactional theory of stress, we theorize that software project risk exposure induces both chronic and acute stress. We propose two key chronic stressors – task demands overload and goal conflict – and two acute stressors – loss of control and changes in task requirements. We also suggest that not all project risk factors create stress for the project manager. Indeed, we posit that while core project characteristics do play the role of stressors, project environment characteristics instead play the role of coping resources, which influence the project manager’s appraisal of the stressors.

Each element of our proposed theory suggests several avenues for future research (see Table 3). For example, chronic and acute stressors other than those outlined above may be important for software project management. Further, these types of stressors may be related in that acute stressors can become chronic under certain conditions. Chronic stress may also have particular lasting properties which mean that this stress does not immediately disappear the moment a project is finished, but rather it may dissipate over time. Research should also further examine the distinction between software project risk drivers that act as stressors and those that act as coping resources and examine if these two types of risk drivers need to be managed differently. Future research could compare various coping resources and determine – when multiple appropriate resources are available – which resources take precedence under what conditions. For example, when is organizational support more important than team expertise? Finally, research should examine to what extent positive and negative project manager stress co-occur in a project and what stressors bring about these different types of stress.

| Table 3. Research questions concerning stress in software project management |
|---------------------------------|--------------------------------------------------------------------------------|
| Chronic and acute stressors | What other chronic and acute stressors are important in the context of software project management? How do chronic and acute stressors interact over time? How does chronic stress dissipate or resolve? |
| Software project risk drivers | Given that certain software project risk drivers act as stressors, while others act as coping resources, how should each type be managed? |
| Coping resources | When multiple resources are available, how do they interact? Are certain resources more important than others when coping with software project manager stress? |
| Positive and negative stress | Are certain stressors associated with positive stress while others are associated with negative stress? |

Our paper offers a number of contributions. First, by examining software project management from a perspective that differs from the established management control lens, we propose a new way of understanding the antecedents of software project managers’ behaviors. Second, by interpreting software project risk drivers as antecedents of the stress experienced by project managers, we open a new avenue for studying the influence of project risk. In particular, we suggest that risk drivers do not only have an influence on the outcome of a project but also on the individual software project manager. Third, we distinguish between project risk drivers that act as stressors and those that act as coping resources. Fourth, by theorizing on the existence of chronic and acute stressors, we open the way for a dynamic analysis of stress in the context of software projects. Finally, by using the cognitive-transactional theory of stress to examine stress in software project management, we offer an explanation of the process through which stress arises.

With the ultimate objective of contributing to the improvement of software project management, we are aware that this work constitutes only a first step. Research is needed to empirically examine the ideas and research agenda that we put forth in this paper. Research should also explore how software project
managers cope with stress: Which coping strategies do they employ? What are their positive and negative consequences for the project manager, for the project team and for the project itself? We believe that further developing this stress perspective constitutes a fertile ground to understand the emotional dimension of software project management, thus providing a valuable complement to dominant approaches focusing on planning and control.

5. References


