Why Fit in When You Were Born to Stand Out? The Role of Peer Support in Preventing and Mitigating Research Related Stress Among Doctoral Researchers

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Abstract

The most important people who enabled the world to develop to its current stage, and continue to facilitate its further progress, are dedicated researchers in multiple disciplines ranging from natural sciences to social sciences. However, any long-term research such as a PhD project, particularly one that involves fieldwork exposing a researcher to challenging and risky situations, can be a very stressful experience leading to both primary and secondary trauma. Yet, there has been very little research to appreciate, understand and support the stressful and traumatic experiences in doctoral researchers, both during PhD research generally and specifically in the unnerving exposures to challenging fieldwork situations. This paper fills this gap by probing the two fundamental questions: 1) how do research stressors, related to PhD research in general and to fieldwork in particular, transform into stress for doctoral researchers; and 2) how can peers assist in stress prevention and stress mitigation? The paper dissects the existing literature at conceptual, theoretical and practical levels. To provide a theoretical framework by which research stressors can be identified in doctoral researchers, we first combine the Demand-Resource (D-R) model with Conservation of Resource (COR) theory. We argue that this catalysed theoretical framework provides more effective primary mechanisms to identify stress in doctoral researchers. Secondly, drawing on Social Support Theory, we develop a peer support model of stress prevention and stress mitigation through four types of peer support: 1) informational; 2) emotional; 3) instrumental; and 4) social companionship. Thirdly, the socio-psychological mechanisms underlying Social Support Theory through which peer support can assist in pre- and post-stress situations are analysed to strengthen the explanatory power and practical usefulness of the proposed peer support model. The paper argues that researchers that actively develop a wider spread of peer support in accordance with our peer support model are more likely to cope with the research related stress effectively during and after their projects and challenging fieldwork.

Key words: peer support, researcher stress, secondary trauma, social support, stress prevention, stress mitigation

1. Introduction

Academics as a profession is traditionally viewed as stress free due to high levels of academic freedom, clarity of job description and performance indicators, and tenure protected positions (Thorsen 1996). This perception has changed in recent years as concerns have been raised in both academic and media circles pointing at an alarming increase in primary and secondary traumatic stress among academics generally, and specifically among doctoral researchers (Thorsen 1996; Winefield et al. 2003; Kinman 2001; Stubb, Pyhältö and Lonka 2011; Bozeman and Gaughan 2011; The Economist 2012; Shaw and Ward 2014; Levecque et al. 2017). Studies show that more than 40% doctoral students leave their projects midway due to stress related burnout primarily because they are underprepared and insufficiently supported to effectively carry out processual, interactional, intellectual and financial aspects of research and demanding fieldwork spanning over several years (see Tinto 1993; Golde 2005; Lovitts 2001). This

alarming attrition rate highlights the significance of this issue that comes with devastating economic, social and emotional costs for the demoralized doctoral researcher at an individual level (Baird 1990), which may also hamper group level performance if the research was to be carried out in a group (Golde 2005). At a societal level, the waste of ever shrinking resources and possible future shortage of researchers to lead scientific developments are likely implications of higher levels of researchers' stress and burnout (Tucker, Gottlieb and Pease 1964; Abedi and Benkin, 1987; Gillingham, Seneca and Taussig 1991).

There has been a widespread recognition that doctoral researchers, especially early career social scientists conducting experiments, interviews, ethnographies, surveys, action research or any other variant of empirical research involving fieldwork, are vulnerable to intense stress arising from multiple sources. But, to our surprise, considering doctoral researchers as a specialised area to sketch the possible ways for preventing and mitigating stress, the existing literature has not touched on two pertinent and intertwined questions: 1) what are the mechanisms of stress generation among doctoral researchers; and 2) how peers can assist in prevention (at the pre-stress stage) and mitigation (at the post-stress stage) of stress in researchers?

Another major gap in the existing literature, which is primarily focussed on school teachers and academics generally, is that their findings are not specifically applicable to doctoral researchers because they are too generalized and thus overlook differences between doctoral and experienced researchers in terms of job responsibilities, experience, and work environment (Kinman and Jones 2008; Levecque et al. 2017). We argue that doctoral researchers need tailored and more explicit support to successfully tackle the emotional and psychological challenges faced during the cumbersome doctoral research process (Kamler 2008, Stubb, Pyhältö and Lonka 2011). However, the literature on stress among doctoral researchers is far from being instructive or even coherent. Hence, it stands in need of further conceptual development in an interdisciplinary manner to offer a comprehensive guide for doctoral researchers and other stakeholders to enable an effective dealing of research related stress. Among doctoral researchers, in addition to general research related stress, stressful interactions with informants and stakeholders during fieldwork can cause further stress aggravation resulting in secondary trauma and possibly a complete burnout, which broadly falls under the category of research related stress and within the scope of our analysis.

Our extensive review of Social Support Theory, researchers stress, job stress, and burnouts literatures in Part 3-7 below reveals that research in the field of occupational stress at a general level has significantly progressed not only to comprehend stress generation mechanisms but also to examine possible solutions to mitigate stress and increase an individual's wellbeing. Although, several determinants are highlighted to mitigate stress, including primary and secondary traumatic stress but social or peer support and coping mechanisms have received highest empirical support across a variety of settings as predictors of stress and as a means for stress prevention and stress mitigation among researchers generally (Carlson and Perrew 1999; Schaufeli and Greenglass 2001). In the context of this research, we understand secondary trauma as a kind of trauma incurred to a researcher after exposure to people who have been traumatized themselves, disturbing descriptions of traumatic events by a survivor, or others inflicting cruelty on one another (Cieslak 2013). The secondary traumatic stress occurs to researchers who are directly exposed to highly traumatic contexts that witness human suffering with no temporal, spatial or other preventive "buffers" (Kiyimba and O'Reilly 2015). It may result from a sudden event or a chronic exposure to potentially traumatizing events (Ellis and Knight 2018; Terr 1991). While placing our analysis within the general literature on occupational stress, we depart from this generality of approach by narrowing the discourse down to the positive impacts of peer support and argue that the impact of peers on the prevention

and mitigation of research related stress is the highest among all other sources of support. We are fully aware that our approach is not unique as other studies have taken a similar approach by differentiating, for example, between "family" and "work-related" sources of social support and their operational mechanisms for stress reduction (See Halbesleben and Buckley 2004).

Three conceptual frameworks ensue, which are adopted in this article: 1) a detailed study is needed with specific focus on doctoral researchers within the existing broader empirical and theoretical research on the academic stress and social support; 2) a theoretical framework is needed to conceptualise stress, including both primary and secondary trauma, in doctoral researchers as a separate category; and 3) there is a need to develop a specialised model for each of the various social support actors including the peer support model, which is the focus of this research.

In order to inform the academic stress research scholarship about both fieldwork and non-fieldwork related stress generation mechanisms among doctoral researchers and positive impact of peer support, we combine the arguments from D-R model (Demerouti et al. 2001), COR theory (Hobfoll 1989) and Social Support Theory (Thoits 2011). We believe that our development of a specialised peer support model to prevent and mitigate stress in doctoral researchers will make three important contributions in the existing literature.

1. *A priori* theory: most doctoral researchers face immense amount of stress during their research generally and particularly during extensive fieldwork as they operate under varying conditions, including stressful research processes, environmental conditions and financial constraints to even more stressful interactions with informants and stakeholder causing secondary trauma, that can only be appropriately explained by *a priori* theory because empirical studies are restrained by research design and selection of representative samples (see Kinman 2001; Levecque et al. 2017; Boyd et al. 2011; Stubb, Pyhältö and Lonka 2011; Bacharach 1989; Whetten 1989).

2. Categorization of stressors: informed by the D-R model on job stress and burnout (Demerouti et al. 2001; Freedy and Hobfoll 2017), we explicitly categorize the causes of doctoral researchers' stress into three types: 1) demand generating stressors; 2) resource straining stressors; and 3) dual mechanistic stressors.

3. Peers as an independent category of support: considering the unique position of peers, among the broad range of social support actors, due to their peculiarity, proximity and familiarity with similar experiences, we conceptualize peers separately from other categories of social support actors (Thoits 2011). Therefore, we argue that our 'peer support model' of stress prevention and stress reduction among doctoral researchers can greatly assist researchers on all types of research related stress. It not only adds explanatory value to some of the existing correlational findings, but also provides a much-needed theoretical impetus for future theoretical and empirical developments.

The remainder of the paper is organized as follows: Section 2 clarifies terminological differences between three major concepts of 'stressors', 'stress' and 'burnout' for effective theorizing. Section 3 critically evaluates the literature on dominant theoretical perspectives in occupational stress and burnout to explicitly highlight three primary mechanisms of stress generation among doctoral researchers based on the D-R model and COR theory. In section 4, we analyse the existing literature on academic stress based on the three mechanisms developed in section 3. In sections 5, 6 and 7, based on Social Support Theory, we identify, conceptualized and theorized the types of possible peer support and socio-psychological mechanisms for stress

prevention (i.e., to prevent the forthcoming stressors) and stress mitigation (i.e., to mitigate the prevalent stress) among doctoral researchers. Each of these sections concludes with the empirically testable propositions. Section 8 concludes that with the help of targeted networking based on our peer support model, doctoral researchers can seek and benefit from valuable and most relevant advice from peers in the larger community of researchers in their respective fields who have experienced the similar level and kind of stress while working on their own projects.

2. Terminological Underpinnings

Before moving on to discuss the literature relevant to stress, burnout and conceptualizing stress among PhD researchers, we consider it important to differentiate, clarify and define the 'stress', 'stressors' and 'burnout' terms, because it is a common practice in the existing literature to use these terms interchangeably with blurred distinctions. For example, some literature uses the term stress as 'stimulus' whereas other literature has used stress as 'individual response' Yet, stress has also been used to refer to both stimulus and response collectively. This three-way use of the term 'stress' not only produces semantic difficulties but also hinders theoretical development on stress in researchers (Kinman 2001).

Lazarus attempts to clarify the term stress by explaining that "stress arises when one appraises a situation as threatening or otherwise demanding and does not have an appropriate coping response" (Lazarus 1966). Whereas according to Kinman, 'stressors' are source of pressures that refer to characteristics of external environment (Kinman 2001). Burn out, on the other hand, refers to "a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do 'people work' of some kind" (Maslach 1982, 3). Considering these semantics and conceptual differences in these three terms in the context of stress among doctoral researchers, we posit that research stressors refer to all pressures originating from research (e.g. fieldwork related stress, dealing the cumbersome publication process etc), other job responsibilities (e.g. teaching, administrative assistance, research assistantship) and environmental challenges (e.g. inconducive working environment at the department), which doctoral researchers confront throughout the life cycle of their research project; namely, selection, planning, execution and closure phase.

On the other hand, for the purposes of this paper, we define research stress (including both fieldwork and non-fieldwork related stress causing both primary and secondary trauma) as the psychological appraisal of a situation as threatening or otherwise demanding and perception of inadequate preparation with coping response among doctoral researchers throughout the research project life cycle. On the other hand, a researcher's burnout is understood as the syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment occurred among PhD researchers due to consistent pressures from research process related or environmental stressors.

3. Theoretical Underpinnings

In this section, we briefly explain the development of D-R model over time, which in combination with the COR theory, provides a comprehensive theoretical ability to offer explanation for understanding the mechanisms of stress generation among doctoral researchers confronted with processual, interactional, environmental and financial challenges. We have specifically chosen the D-R model because it combines the best features of its predecessor models in the occupational stress and burnout literature. But, considering the less developed

feature of resources in the D-R model, we integrate it with COR theory to offer a comprehensive explanation of the ways stressors are transformed into stress among doctoral researchers.

Tracing the historical development of D-R model in the occupational stress literature (Demerouti et al. 2001), its earliest version was known as demand-control (D-C) model that was developed and introduced by Karasek (1979). According to D-C model, job stress is the individual response to imbalances between the job demands and the resources available with the person. It describes a situation as stressful when the job demands are high, but the individuals do not have the required resources to tackle this demanding situation. A major flaw in the D-C model is that it restricts the concept of resources to only adequate job autonomy and control, while not considering the broader available sources of resources (Karasek 1979). The D-C model was further criticised, revised and expanded by Johnson and Hall (1988) on the ground that it did not consider co-worker support (which we call peer support in our model). The Johnson and Hall (1988) model was named as Demand-Control-Support (D-C-S) model. They coined the term 'iso-strain' to refer to the lack of social support as a predictor of stress. In this new model, Johnson and Hall argued along with two original dimensions of the D-C model (i.e., high psychological workload and low control) that a third dimension in the form of lack of social support is also a major predictor of stress (Johnson and Hall 1988).

Despite the theoretical development and consensus among D-C and D-C-S models with reference to job demands as a source of stress, both models have a very narrow view of resources and do not adequately conceptualize and theorize the resource dimension. This literary deficiency was tackled in 2001 with the development of D-R model, which integrated D-C and D-C-S models to offer a comprehensive model of stress generation (Demerouti et al. 2001). The D-R model has similar assumptions about the demand dimension of its predecessors, however, the control and support dimensions of the D-C and D-C-S models are subsumed into a single dimension, namely, the resource dimension. In addition to this, according to D-R model, resources can come from both external or internal sources. According to the D-R model, two broad categories of work characteristics can be distinguished, namely: 1) job demands; and 2) job resources. Accordingly, there can be several jobs demands, in addition to the psychological demands, such as physical, social, interactional, and organizational. Additionally, there can be physical and psychological costs to meet varied demands throughout the research and fieldwork process thus requiring sustained physical and/or psychological effort on part of the doctoral researcher (see Demerouti et al. 2001). However, like other models, the D-R model was also vulnerable to criticism due to not offering enough explanations about the resource dimension (see Park et al. 2014).

Another well cited and dominant theory in stress and burnout literature that has effectively discussed the resources concept is COR. The COR theory of stress was offered by Hobfoll (1989) to explain the fundamental human motivation to maintain current level of resources and to pursue gaining of new resources to maintain reduced stress levels (Hobfoll 1988; 1989). In COR theory, stress is defined "as a reaction to the environment in which there is (a) the threat of a net loss of resources, (b) the net loss of resources, or (c) a lack of resource gain following the investment of resources." (Hobfoll 1989). At any given time, a lack of the required level of perceived or net resources may lead to an increase in stress and this situational persistence may culminate in a researcher's burn out (Hobfoll & Freedy, 1993; Park et al 2014). The COR theory assumes that, due to the underlying psychological mechanisms, individuals feel higher levels of stress when they lose valuable resources while the proportionate impact of resource gain on wellbeing is low. In addition to this, COR theory also considers the difference between routine life and stressful life situations by proposing that individuals primarily focus on resource accumulation in everyday situations to avoid potential resource losses, however, during

stressful situations the individual's emphasis is on minimizing the net resource loss (Hobfoll 1989).

The core concept in OR theory is resources, and the fundamental tenet of this theory is that individuals try to build, maintain, develop and protect the required resources for effective handling of current and potential stressful situation (Hobfoll 1988).Simply put, 'resources' are anything which individuals (i.e., doctoral researchers) perceive as valuable. Resources can be material objects, professional or social conditions, personal characteristics or individual energies. Objects as resources are valued because of their inherent physical value; conditions are resources to the extent that they are perceived by researchers as resources; personal characteristics are resources to the extent that they assist in stress coping; and energy resources are comprised of time, money and knowledge (Hobfoll 1989).

Consequently, we conclude that although the D-R model is recognized as a dominating model in the burnout literature as it adequately highlights the predictors of stress through sources such as an increase in job demands and a decrease in level of resources. However, the D-R model is unworkable when it comes to the explanation of mechanisms of stress generation under resource deficient conditions. In other words, why and how psychological mechanisms, such as a reduced level of resources, lead to higher levels of stress is unexplained in the D-R model. The COR theory, on the other hand, explains the significance of conservation of resources but does not help to predict stressors. Therefore, we argue that the D-R model on stress and burnout coupled with COR theory provides a better explanation for stress generation mechanisms among doctoral researchers. Having access to the required resources facilitates enhancement of better and effective coping capabilities, which eventually prevents or mitigates the potential of existing threat of research stressors (Demerouti et al 2001).

4. Stress Generation Mechanisms in Doctoral Researchers

Based on the D-R model and the COR theory, research related stress among doctoral researchers can be perceived in two ways; 1) either stressors may increase perceived situational demands; or 2) they may cause a perceived or net loss of resources, making the researcher feel a lack of coping capabilities for effective situational handling. By applying these perceptions, this section analyses the literature on stress in researchers to differentiate three types of stress generation mechanisms: 1) demand generating research stressors; 2) resource restraining research stressors; and 3) dual mechanistic research stressors.

Demand generating stressors, also known as energetical stress generators, are those sources of pressures for a doctoral researcher that increase the perception of a situation as being highly demanding. These demanding situations require higher levels of mental and physical efforts on the part of young researchers to sustain an expected performance level. They can originate from higher workloads stemming from having to balance the diverse requirements associated with teaching, research and administrative activities, higher levels of self-expectations, high impact publication pressures, the development of state-of-the-art courses, learning and performing new roles, developing new relationships, meeting submission deadlines, work-life balance, and challenges emanating from the nerve-wrecking doctoral process (See Gillespie et al. 2001; Kinman 2001; Winefield et al. 2003; Tytherleigh et al. 2005; Biron et al. 2006; Hakanen, Bakker and Schaufeli 2006; Boyd et al. 2011; Levecque et al. 2017; Appel and Dahlgren 2003; Stubb, Pyhältö and Lonka 2011; Seldin 1987).

Apart from an increase in situational demands, doctoral researchers may also confront stressful circumstances due to a perceived loss of adequate resources or an actual net loss of resources (Hobfoll 1989, 2001; Freedy and Hobfoll 2017). Resource loss, lack of financial resources,

inequitable distribution of financial resources for conference participation and research related travels, job insecurity, perceived lack of control over one's work environment and less supportive working conditions are recognised as important determinants of stress in doctoral researchers due to such resource-restraining conditions. So, researchers' perception of a threat to their resources, or a net loss of resources may lead to increased levels of stress (Hakanen, Bakker and Schaufeli 2006).

Some stressors can generate stress in two ways, either by contributing to the perception of increasing demands or by adding to the perceived resource loss. In this regard, problems with supervisors and relationships with peers, a competitive research environment and decision making culture, supervisors' leadership style, organizational policies and systematic discrimination are some of the factors that can impose excessive demands on doctoral researchers working within already limited resources, or that can result in decreasing levels of resources to meet the requirements of job responsibilities (Appel and Dahlgren 2003; Kurtz-Costes, Andrews Helmke and Ülkü-Steiner 2006; Stubb, Pyhältö and Lonka 2011; Levecque et al. 2017). Thus, these factors may generate stress in both ways either by increasing perceived demands or by reducing resources. Importantly, however, these research stressors may or may not be a source of stress among doctoral researchers depending upon their appraisal of the situation (Lazarus 1990). For example, participating in a cross-cultural ethnography abroad may be extremely stressful for one researcher, but may not arouse the same negative feelings in another, or may even generate eustress (or positive stress) depending on a researcher's perception. (Kinman 2001). Therefore, stress is primarily a subjective experience and refers to a stage where doctoral researchers face mental or emotional strain because of a perceived imbalance between environmental demands and their own response capabilities (Stubb, Pyhältö and Lonka 2011; Levecque et al 2017). Despite the subjectivity of experiences causing stress, at more abstract level, the three types of stress generation mechanisms can nevertheless be used to explain the presence of stress in doctoral researchers. A doctoral researcher's psychological appraisal of a situation as stressful is closely linked with feelings of helplessness and the loss of self-esteem, thus reflecting his perception of being unable to cope with the situational demands of doing extensive fieldwork. Therefore, a doctoral researcher's appraisal of a situation as stressful, either due to increased demands or a threat to resources (or some combination of the two) has a negative impact on his affect and will tend to elevate his physiological and behavioral responses, thus eventually generate stress (Cohen and Wills 1985).

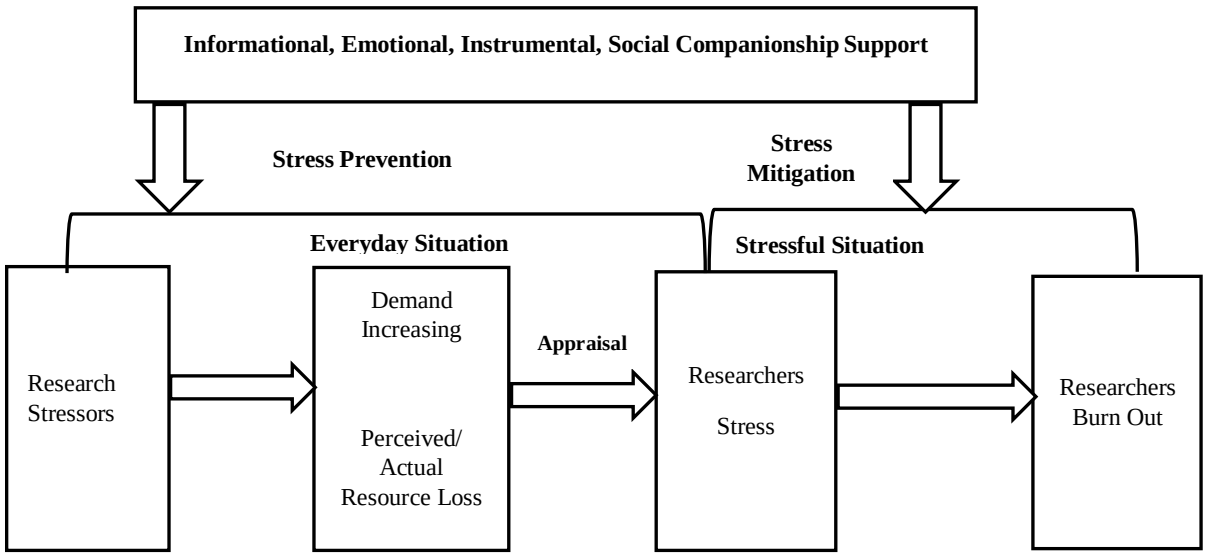

Figure 1: Peer Support Model for stress prevention and stress mitigation among doctoral researchers

Concluding the above arguments, and as outlined in Figure 1 above, we conceptualize doctoral researchers' conditions in two types: 1) everyday situations, i.e., devoid of major stressors; and 2) stressful situations, i.e., consequence of situation appraised as stressful due to increased demand, reduced resources or both (e.g. doctoral researchers' repeated failure to identify and convince the appropriate respondents for primary data collection during fieldwork). The ability of researchers to focus, and their need for peer support vary during routine situations and stressful situations. For example, during normal life situations, doctoral researchers need peer support to prevent the occurrence of stressful situations. However, in stress situations, their purpose shifts to stress mitigation rather than stress prevention with the help of peer support. We argue that this theoretically derived division is pertinent to understand, explain, and appraise the role of peer support in different circumstances. Thus, in connection to this division, we explained the theoretical mechanisms of informational, emotional, instrumental and social companionship support from peers separately for stress prevention and stress mitigation in the above model. The general aim of peer support for stress prevention is to assist doctoral researchers in minimizing the chances of being dragged into stressful conditions, whereas the main aim of peer support for stress mitigation in stressful situations is to enable doctoral researchers to successfully handle stressful conditions and save themselves from a complete burnout. In other words, our model is equally applicable to all situations of stress causing both primary and secondary trauma.

5. Peer Support

This section analyses the literature on social support theory to highlight how peer support is recognised as a sub-dimension of social support for both stress prevention and stress mitigation. Before discussing the impact of peers, both inside and outside of a researcher's home institution for preventing and mitigating field and non-field related stress among doctoral researchers, we argue that the concepts of 'peer integration', 'peer ties', or 'peer network structures' should be differentiated from the concept of peer support in a similar manner as the terms social network structure, social ties, or social integration are viewed as different forms of social support in the literature. In the context of our model, we adapted Cohen's definition of social support and consider peer support for doctoral researchers as the provision of psychological and material resources from peer networks in preparing a doctoral researcher to effectively cope with stress while 'peer integration' refers to the extent of connectedness in peer networks, which is measured through number of ties or social network analysis techniques (Cohen 2004, 676). In other words, peer integration is the structural support, whereas, peer support refers to functional support from peers (House 1988; Thoits 2011).

The above mentioned structural and functional support can come from several social support sources, including family, friends, neighbours, co-workers, organizations, and government institutions. Thoits (2011) classified all possible sources of social support into two broad categories and conceptualized them as 'primary group/significant others' and 'secondary group/similar others'. The primary group is comprised of family members, friends, and relatives who have strong ties reflected in the form of higher emotional bonding, informal relationships, and great time spent together (Granovetter 1973). Secondary group peer interactions are generally characterized as formal interactions guided by rules, regulations, and hierarchical positions; and are reflected in the form of weak ties. Social support for stress reduction does not necessarily come from close people comprising 'significant others', and peers comprising 'similar others' are also considered a very important source of support in times of crises (Thoits 2011). Peer support occupies a unique position in connection to the prevention and mitigation

of researchers' stress because of prior experiential similarity between both researcher and support-giver (Lovitts 2001). In this context, our peer support model of stress prevention and mitigation among doctoral researchers applies to peers falling under the categories of 'weak ties' (Granovetter 1973), 'similar others' (Sullivan 2013) or 'secondary group members' (Thoits 2011).

The peer network for our model may consist of various structures of interactional exchanges. It can be a dyadic interactional exchange that involves two persons, or a network of interactional exchanges involving several persons. The dyadic interactional structures reflect the reciprocity, multiplexity, and durability during exchange relationships, while network interactional exchange reflects the density, homogeneity, multiplexity, or dispersion (Barrera 2000; House 1988). The opposite of peer integration is 'isolation' or 'alienation' which occupy a prominent status in psychosocial theories of distress (Thoits 1982).

The stress-related research scholarship argues that higher levels of individual integration into peer networks positively and causally influences stress levels through psychological and material support (Thoits 2011; Cohen and Wills, 1986; House 1981; Turner 1981; Barrera 2000; Gottlieb 1983; Cohen 2004). Peer integration can be a useful source of 'belonging' to the professional community (Sarason 1974). Although previous research has repeatedly highlighted that peer support is an integral part of studies on occupational stress reduction and mitigation, many commentators note that it is still undertheorized (Cobb 1976; Cohen and Wills 1985; Thoits 1995; Uchino 2009; Cohen and Janicki-Deverts 2009; Thoits 2011). Based on Thoits' (2011) approach to divide sources of social support into primary and secondary groups, we move one step further to divide peer group members into two sub-categories; 1) a 'primary peer group' composed of people who occupy teaching and research as their primary role, either within the same institution or outside;; and 2) a 'secondary peer group' which includes all other persons in administrative positions in the same university or institution. It is understood that in some instances this division becomes arbitrary, such as the supervisor of a doctoral candidate can also be a head of department, thus playing both roles simultaneously. However, although the distinction between two groups remains useful to understand the proposed model, we believe that, by and large, both groups offer similar types of support, although their character changes in different situations.

To prevent imminent stress in routine life and, more specifically, to mitigate the adverse impacts of research stressors during stressful situations, doctoral researchers should integrate into a peer group for informational, emotional, instrumental support (Barrera 1986; Thoits 2011), as well as for social companionship support (Cohen and Wills 1985). Although the types of support remain much the same, irrespective of the specific situation in which a researcher finds himself/herself, however its character and impact mechanism vary in routine life situations and during stressful situations. In what follows, we describe the content and most salient features of different types of peer support.

6. Types of Peer Support

6.1. Informational Support

"Informational assistance is the provision of facts or advice that may help a person solve problems" (Thoits 2011). Similarly, "Informational support is help in defining, understanding, and coping with problematic events" (Cohen and Wills 1985). A careful analysis of both definitions reveals that the basic aim of informational support is to facilitate a correct diagnosis of the problem at hand, and to assist in deciding the right course of action for its effective

resolution through sharing of relevant information or providing advisory services (Cohen and McKay 1984). We would argue that doctoral researchers are in dire need information at each stage of their research project life cycle throughout their PhDs. Notably, during fieldwork, they need relevant, reliable and timely information to identify their potential study participants, in light of which they can decide the best approaching strategy. Additionally, having greater access to information from peer networks also assists in tackling potential interactional challenges and ethical paradoxes, and may result in adequate resource accumulation for traveling and other needs. Resultantly, doctoral researchers will be better equipped to comply with institutional guidelines and to decide, in the face of several fieldwork related challenges, to effectively conduct their data collection and analysis. Informational peer support can come in several forms such as advisory relationships or peer mentoring (Bargar and Chamberlain 1983; Girves and Wemmerus 1988; Lovitts 2001; Golde 2005; Gardner 2007). Peers can assist in exchanging the required information, depending on their role in peer networks and, by using multiple channels such as the use of online resources, help arrange orientation programs, develop program handbooks, and organize formal and informal meetings among peers. Therefore, we argue that information exchanges through personal interactions with supervisors and other colleagues are also effective means of stress prevention and mitigation.

6.2. Emotional Support

"Emotional support refers to demonstrations of love and caring, esteem and value, encouragement, and sympathy", and is also known as 'esteem support', 'expressive support', 'ventilation', and 'close support' (Cohen and Wills 1985). Unlike informational support, this type of support is not directly related to any problem resolution. Instead, its primary aim is to communicate warmth and a message of self-esteem to doctoral researchers. This gesture of emotional sustenance conveys a message to doctoral researchers that they are valued for because of their research contributions (Cobb 1976; Cohen and Wills, 1986). Irrespective of the nature of fieldwork, all types of empirical research expose researchers to significant emotional ups and downs throughout the process. For example, low response rates from respondents in quantitative studies, informants' unwillingness and reluctance to participate and share the required information in qualitative studies, researchers' adaptation during ethnographies, and subjects' vulnerability in experimental research, may all possibly result in emotional fluctuations. Thus, we argue that processual, environmental, instrumental and intellectual mismatches result in emotional disturbances among young doctoral researchers and hence necessitate emotional support. Even though this kind of support is usually expected to come from 'primary group members,' it may in some instances, due to a long-developed working relationship at the workplace, also come from peers. Depending on the source of emotional disturbance, and contrary to conventional wisdom that friends and family are better positioned to provide emotional support, emotionally sustainable behaviors from peers are more efficacious for preventing and mitigating psychological and emotional impacts of stressors in certain cases (Thoits 2011)

6.3. Instrumental Support

"Instrumental support consists of offering or supplying behavioral or material assistance with practical tasks or problems" (Thoits 2011). No fieldwork can ever be completed without provision of the required instrumental and logistical support for travelling and data collection. Instrumental support is also known in the literature as 'aid', 'material support' or 'tangible support' (Cohen and Wills, 1985). In this kind of support, peers are expected to provide direct financial assistance (for example through helping with funding applications and by offering to

participate in the funded projects), material goods, or services to resolve the underlying problems (House 1981; Cohen and Wills, 1986) and to keep fellow researchers focussed on their ultimate objective of successfully completing their project. Although primary group members can also provide instrumental support, it has been shown that instrumental support from peers, in comparison to primary group members, is more effective (Thoits 2011). For doctoral researchers, instrumental support from peers comes in several forms such as help with planning for getting finances, co-authorship, allowing access to resources that would otherwise available only to peers (e.g., computers, lab equipment etc.), or the provision of direct assistance in actually carrying out research or fieldwork (Abedi and Benkin 1987; Kinman 2001; Kamler 2008).

6.4. Social Companionship

"Social companionship is spending time with others in leisure and recreational activities" (Cohen and Wills, 1985). Doctoral researchers are emotionally less stressful if they feel that they are welcomed and accepted by their peers as group members. It gives them a sense of belongingness, and resultantly provides a more significant meaning to life as part of a community. A sense of 'belongingness' visibly improves a person's psychological well-being and makes him/her happier (see, e.g., O'Keeffe 2013). Doctoral researchers who spend more time on leisure and recreational activities with their peers feel more comfortable with their professional life, and the impact of social companionship is usually positive even in non-stressful situations. However, the impact is bigger during times when a doctoral researcher is facing highly stressful events from research, personal or environment-related stressors. Competency in social companionship is also a transferable skill, which means it also helps doctoral researchers to develop and optimally utilize the relationships to their respondents during fieldwork.

7. Mechanisms of Peer Support for Doctoral Researchers

We elaborated above how peers may support doctoral researchers through the provision of informational, emotional, instrumental and social companionship. Here, we turn our attention to understanding the underlying explanatory mechanisms in an attempt to formulate a coherent theoretical model of peer support for stress prevention and stress mitigation. The social support literature highlights two primary mechanisms through which peers can support stress prevention and stress mitigation, which are known as: 1) the 'main hypothesis'; and 2) the 'buffering hypothesis' (Cohen and Wills 1985). The primary assumption of the 'main hypothesis' is that peer support assists stress prevention irrespective of situational demands; in contrast, the 'buffering hypothesis' assumes that a stressful situation must first be encountered for the buffering to take effect (Thoits 2011). However, recent commentators have pointed out that the two hypotheses are not necessarily mutually exclusive, and - if suitably combined - may further increase our understanding of stress prevention and stress mitigation. By relying on such a hybrid model, Thoits (2011) has outlined seven mechanisms through which peer support can influence psychological well-being or stress levels, which we propose are also applicable to understanding stress prevention and mitigation mechanisms among doctoral researchers during all stages of their doctoral career, specifically during demanding fieldwork. These seven mechanisms are: 1) social influence or social comparison; 2) role-based purpose and meaning ('mattering'); 3) sense of control; 4) social control; 5) self-esteem; 6) belonging and companionship; and 7) perceived support availability.

The first mechanism, which is social influence or social comparison, means that doctoral researchers can bring changes to their behaviors, attitudes, believes and normative standards by observing how fellow researchers deal with stressful fieldwork, to avoid getting into traumatic interactional situations. The second mechanism, role-based purpose and meaning (or 'mattering'), refers to the impact of reciprocal obligations in social exchange relationships on the prevention of socially deviant behaviors, and conveys a feeling of being 'worthy'. The third mechanism, which is sense of control, means a researcher's personal perception of being able to achieve goals (Bandura 2001), which significantly impacts the stressors in routine life, particularly during stressful times. The fourth mechanism, which is social control, refers to the regulation of social relations by peers to bring about behavioral changes for possible stress prevention and stress mitigation. The fifth mechanism, which is self-esteem, refers to the overall emotional self-evaluation by researchers related to their self-worth. An individual's positive evaluation enhances self-belief and self-efficacy, which resultantly impacts stress levels (Baumeister et al. 2003; Thoits 2003). The sixth mechanism, which is companionship and belongingness, impacts the stressors through fulfilling a fundamental human need for affiliation with some group. Thus, being accepted by one's peer network structures generates a feeling of belongingness and reciprocal rights and obligations among doctoral researchers (cf. Barrera 2000; Berkman et al. 2000; Cobb 1976; Uchino 2004).The seventh and last mechanism, which is the perceived availability of support, gives researchers a sense of satisfaction that their peers are, and will be, there to help in times of need, which activates different appraisal mechanisms among doctoral researchers (cf Thoits 2011).

Based on these seven mechanisms, in our peer support model, we propose that the 'main hypothesis' best explains how routine interactions among peers and doctoral researchers prepare doctoral candidates for proactively preventing the occurrence of major stressful events. When doctoral researchers find themselves in a stressful situation, which is usually an integral part of doctoral journey, the buffering hypothesis is better at explaining how peers may provide higher functional support to deal with the demanding situations needing an immediate response. The following section elaborates the role of peer support in 'routine situations' and during 'stressful situations' for both stress prevention and stress mitigation among doctoral researchers. To conclude this section, we outline testable propositions to verify our more theoretical claims on both types of stress situations through empirical investigation.

7.1. Stress Prevention Mechanisms

In light of the discussion in Part 6, we assert that doctoral researchers with higher peer integration levels are better equipped to deal with stress prevention and stress coping capabilities, and thus better prepared to complete their research projects on time. This increased peer network integration allows them to avoid adverse events and is also a regular source of positive experiences and stability in a socially rewarded role within the research community. On the other hand, and compatible with 'isolation' theories, we maintain that a lack of peer support and/or systematic discrimination by existing networks can lead to higher stress levels; as a result, researchers may eventually fail to complete their projects. Supportive peer networks can organize various orientation and meeting events as a platform for newcomers to effectively integrate themselves into peer networks (Golde 2005). Higher levels of integration of doctoral researchers into peer networks, which takes place as an outcome of socialization, improves their intellectual as well as applied learning abilities. Thus, interaction with peers impacts knowledge, skills, thoughts, behaviors, attitudes, and gives a sense of community feeling (Bragg 1976). As compared to interactions with supervisors or peers in higher hierarchical positions, and also with other actors, relationships with fellow doctoral researchers are the

single most important source of support (Gardner 2007; Halbesleben and Buckley 2004). Overall, more support from peers in a scholarly community reduces fieldwork-related stress among researchers and positively influences the feeling of empowerment. Therefore, doctoral students must be integrated into their departments as well as their disciplinary peer networks in order to get the most benefit out of these peer networks (Tinto 1993; Lovitts 2001; Golde 2005; Stubb, Pyhältö and Lonka 2011).

Doctoral researchers with higher levels of peer network integration are more likely to enjoy better affective and psychological well-being, which can indirectly impact stress levels (House 1981). Regarding the four types of peer support discussed above, the availability of higher levels of emotional support from peer networks indirectly impacts stress prevention through enhancing the sense of sustenance, and by positively impacting the feeling of self-esteem (Thoits 2011; Cohen and Wills 1985). In addition to this, informational support–reflected in the form of routine discussions and informational exchanges between peers sharing similar experiences about life events, their causes and possible actionable ways–not only transforms doctoral researchers' behaviour toward imminent stressors but also enhances their sense of control to effectively tackle future threats. At the very least, researchers receiving this type of informational support will be able to reappraise threatful situations, from being 'difficult' to being 'manageable' (Cohen and McKay 1984; Thoits 1985; Uchino 2004; Thoits 2011).

Peer support in the form of social companionship enhances self-esteem, sense of belongingness and sense of situational control (Cobb 1976; Cohen and Wills 1985; Thoits 2011), thereby impacting positive affect. Alternatively, social companionship can also give access to more emotional or instrumental types of support, which can subsequently impact stress prevention (Cohen and Wills 1985). Instrumental support from peers in the form of being a co-author enhances the self-esteem and professional efficacy of doctoral researchers and also reduces situational demands (Kamler 2008). Additionally, increased financial support or higher provision of other resources increase a sense of control and thus also positively impact self-esteem. Peers, particularly those in higher hierarchical positions and having requisite institutional power, can directly intervene to reduce situational challenges by reducing the functional requirements of doctoral researchers (Kinman 2001; Kamler 2008).

We suggest that persons with low network integration do not have access to the aforementioned-informational, emotional, instrumental, and social companionship exchanges, and this often results in low self-esteem, reduced professional efficacy, and a negative sense of community belongingness. Moreover, persons under these psychological conditions are less prepared to cope with imminent stressors from unnerving fieldwork, which is likely to cause further stress. On the other hand, people who are better integrated into peer networks, and thus have better access to the four types of support exchanges we described, which positively impacts their self-esteem, sense of community belongingness, and professional efficacy.

Proposition 1a: *Doctoral researchers with higher levels of peer network integration have access to greater informational, emotional, instrumental, and social companionship support from primary and/or secondary group peers.*

Proposition 1b: *Doctoral researchers having better informational, emotional, instrumental and social companionship support from primary and/or secondary peer groups, during their routine professional interactions, are more likely to prevent the occurrence of fieldwork and non- fieldwork related stress.*

Proposition 1c: *Doctoral researchers having better informational, emotional, instrumental and social companionship support from primary and/or secondary peer groups, during their routine professional interactions, have higher self-esteem, reduced professional inefficacy, and a positive sense of community belongingness, which inversely impact stress levels among them and better equip them to prevent the occurrence of fieldwork and non-fieldwork related research stress.*

7.2. Stress Mitigation Mechanisms

The second most prominent perspective or mechanism that explains stress mitigation during stressful conditions is known as the 'buffering hypothesis'. The buffering hypothesis was propagated by pioneering scholars who investigated the role of social support for stress reduction (see Caplan 1974; Cobb 1976; Cassel 1976). The fundamental assumption of the buffering hypothesis is that peer support can only be beneficial during stressful situations- i.e., when doctoral researchers experience fieldwork as highly stressful - rather than during everyday situations. In the other words, doctoral researchers appraisal of any situation as stressful, and their perception of being unable to deal with it, are prerequisites for activation, and effectiveness of peer support mechanisms (Lazarus and Folkman 1984). During the early years of research on the 'buffering hypothesis,' the focus rested on the effects of providing broader social support, but in recent years, scholars in the field of stress research have increasingly argues that coping assistance from peers is more effective than that of primary group members (Thoits 2011). Granovetter (1973) makes a similar argument based on his categorization of 'the strength of weak ties'.

Stressful situations are more complex than ordinary circumstances. During stressful times, a doctoral researcher's focus shifts towards handling immediately stress-causing situations, thus changing the dynamics from engaging in reciprocal exchanges of support to receiving unidirectional support from their peers. Despite this change in the character of peer support, the types of available support remain the same, namely, informational, emotional, instrumental, or social companionship. However, two additional assumptions determine the provision of peer support during stressful situations. First, stressful situation must not be the outcome of researchers' own actions; and secondly, peers who are rendering support must not themselves become overwhelmed by the situation at hand, so they can protect themselves from its deleterious impacts (Thoits 2011). In addition to this, the nature of a stressful situations determines the exact character and type of peer support that will be needed, because specific stressful events have their own idiosyncratic coping requirements. For example, if the stressful event is a lack of financial resources, it cannot be healed through an increased emotional provision, at least in the long term, but only by providing, or at least by facilitating the provision, of the required financial support (Cohen and Wills 1985).

Peer support to mitigate researchers' stress may come at two different levels: 1) either through individual focussed strategies; or 2) through organization-centred strategies, in particular the creation of better working conditions. Peers, depending on their hierarchical and network role position, can indirectly impact stress levels among doctoral researchers through, for example, developing new labs, organizing social events, reducing job demands, or amending rules, practices, procedures, and strategies at the department level. However, at the personal level, an emphasis must be placed on the development of an effective coping repertoire on the part of individual researchers, and such personological approaches have become more prominent in the recent stress literature (Hakanen et al 2006).

Proposition 2a: *Doctoral researchers with higher levels of peer network integration have access to greater informational, emotional, instrumental, and social companionship support from primary and secondary peer groups in stressful situations.*

Proposition 2b: *Doctoral researchers having higher levels of informational, emotional, instrumental and social companionship support from primary and secondary peer groups are better equipped to cope with stressful situations than researchers with low peer network integration.*

In stressful situations, doctoral researchers may be supported in two ways: 1) through problem-focussed support, and 2) through emotion-focussed support. The purpose of problem-focussed support is to assist doctoral researchers in understanding the problem at hand, and to decide on the best course of action to solve it. On the other hand, emotion focussed support is not directly concerned with the solution of a problem but is rather concerned with lessening the arousal of negative emotions or to provide distractions from the main problem (Lazarus & Folkman 1984; Thoits 2011). Among the available four types of peer support, informational and instrumental support are related to problem-focussed support, whereas social companionship and emotional support fall into the category of emotion-centred support (Thoits 2011).

Through increased provision of informational and instrumental support, problem-focussed support enhances the coping capabilities of doctoral researchers to tackle immediately demanding stressful situations. Therefore, a doctoral researcher's stress levels are mitigated either through the reduction of situational demands or through an increased supply of the necessary resources to deal with stressful situations. Having required levels of financial and relational resources and informational access to solve immediate problems as and when they arise, doctoral researchers can enjoy an increasing sense of control or self-efficacy, and resultantly feel more confident about their coping capabilities and strategies (Cohen and Wills, 1985; Thoits 2011).

Apart from problem-focussed support, peers can also indirectly impact the reduction of stress levels among doctoral researchers by influencing their emotional regulation abilities in response to demanding situations (Thoits 2011). In this regard, we should expect that peer support mechanisms, through emotional sustenance, are more effective when provided by peers than by primary group members, because peers usually have been through similar experiences, and they also have lower levels of personal investment compared to primary group members. Thus, due to their experiential similarity with doctoral researchers, peers are better prepared to understand the situational nuances of the demanding situations, and resultantly are better positioned to empathize with distressed researchers by being able to anticipate their typical emotional reactions and situational concerns (Clark 1987). With higher levels of emotional support from their peers, doctoral researchers are bound to experience enhanced levels of awareness concerning their self-worth, self-esteem, and sense of belongingness. More specifically, social companionship can also impact stress levels by enhancing a doctoral researcher's self-esteem or by diverting attention from underlying stressors. On the other hand, doctoral researchers with lower levels of peer support are bound to feel helpless, which eventually poses a direct threat to their self-esteem and may thus lead to burnout.

In sum, the absence of peer support generally leads to higher stress levels through physiological processes and behavioural patterns (Cohen and Wills 1985; Hakanen et al. 2006; Thoits 2011). In addition to problem-focussed and emotion-focussed peer support during stressful situations, a third type of support mechanism may come in the form of social influence. Younger doctoral

researchers may experience a peer's guidance through personal observation and subsequently emulate their attitude and behavior during similar situations (Taylor and Lobel 1989). The experience that is gained from observing peers to solve difficult situations can impact doctoral students' coping efforts directly or indirectly, by reducing emotional and situational demands. This type of social influence creates an increased sense of control and generates positive emotions which counteract prevailing stress patterns, and also provides motivation for achieving one's life goals by following the footsteps of peers (Markus and Nurius 1986). Therefore, we propose that:

Proposition 2c: *Doctoral researchers with higher levels of informational, instrumental, emotional and social companionship support from primary and secondary peer groups, are more likely to better cope with stressful situations through an enhanced sense of control, enhanced self-esteem and an increased sense of belongingness.*

To conclude this section, we summarize the main argument that was made above. We presented six theory-driven, but testable propositions of our peer support model for preventing and mitigating stress among doctoral researchers during both every day and stressful situations. Our fundamental thesis is that neither of the two widely accepted hypotheses in the stress literature - namely, the 'main hypothesis' and the 'buffering hypothesis'–alone are sufficient to explain stress reduction among doctoral researchers. They offer valuable insights under different conditions, so they must be understood in their respective contexts. Our set of propositions specify the conditions under which each hypothesis offers the better explanation of stress reduction and mitigation, and, in addition, highlight the underlying socio-psychological mechanisms of peer support.

8. Conclusions

Our peer support model can best be understood as consisting of two parts: 1) a description of the situations in which doctoral researchers need peer support, and how routine situations transform into stressful situations (sections 2, 3 and 4); and 2) a set of specific hypothesis about which types of support peers can offer in different situations, and how each type of support can assist with stress prevention and mitigation among doctoral researchers (sections 5, 6, and 7).

For the first part of our model, we relied on arguments from both the D-R model and the COR theory, two dominant models in the job stress and burnout literatures. By integrating these two-explanatory models, we reviewed, analysed and classified potential stressors for doctoral researchers into three broad categories. At an abstract level, our peer support model, distinguishes two types of situations doctoral researchers regularly confront, which we termed - following the extant stress literature - as 'routine situations' and 'stressful situations'. We proposed that a transformation from routine situations to stressful situations occurs if doctoral researchers experience a situation as highly demanding and view themselves as resource deficient in the process. However, departing from the existing literature, we outlined a third category of stressors that we call 'hybrid stressors'. Those hybrid stressors generate stress among doctoral researchers either by increasing situational demands or by aggravating feelings of resource deficiency. Our theoretical integration of the D-R model with the COR theory offers a better understanding of the underlying theoretical mechanisms, which thus goes beyond the widespread focus on purely correlational empirical findings in the extant literature on fieldwork and non-fieldwork related stress among doctoral researchers, including primary and secondary trauma. Additionally, the model we have presented clearly differentiates between the hitherto conflated concepts of *stressors*, *stress*, and *burnout* on temporal grounds.

The second part of our model deals with the question of peer support during routine and stressful situations. We presented six theory-based, empirically testable propositions that draw on the resources of Social Support Theory. Our model goes beyond the existing literature by proposing that two widely accepted hypotheses of stress prevention and stress mitigation are applicable in different contexts, though none of them has universal applicability. In addition, we explicitly discussed the socio-psychological mechanisms through which different types of peer support, i.e., informational, instrumental, emotional and social companionship, assist in stress prevention during routine situations, and in stress mitigation during stressful situations. Moreover, we proposed that during everyday situations, doctoral researchers having higher levels of peer support are more likely to equip themselves better to prevent the occurrence of potential stressors through enhanced self-esteem, an increased sense of community belongingness, and by reducing professional inefficacy. Similarly, during stressful situations, doctoral researchers having better access to peer support are likely to be better prepared for handling difficult situations through an enhanced sense of control, increased self-esteem, and better emotional regulation abilities. Thus, we argue that our peer support model is not only comprehensive but has great explanatory value for understanding not only stress-generating mechanisms, but also the concrete ways through which peers can facilitate doctoral researchers in the completion of their doctoral journeys.

We suggest that future researchers on academic stress should take doctoral researchers as a separate category from other academic positions, and more research should be conducted to identify theoretical mechanism that are apt at explaining correlational findings between stressors and stress. Our peer support model is the first step in this direction. Future research should focus on empirical validation of our theoretically driven propositions.

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