

AN AFFECTIVE EVENTS THEORY  
PERSPECTIVE ON MENTAL HEALTH IN THE  
WORKPLACE

by

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B.A., Colorado College, 2013

A dissertation submitted to the  
Faculty of the Graduate School of the  
University of Colorado  
in partial fulfillment  
of the requirement of the degree of  
Doctor of Philosophy  
Leeds School of Business

Department of Organizational Leadership and Information Analytics

2021

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## ABSTRACT

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An Affective Events Theory Perspective on Mental Health in the Workplace

Dissertation directed by Russell Cropanzano

Unlike their counterparts in public health, management scientists have devoted relatively little attention to understanding clinical emotions at work, particularly anxiety and depression. Based upon affective events theory, this dissertation argues that negative workplace events can trigger these clinical states, but this is most likely among individuals with a strong predisposition toward anxiety and depression. In two essays, I report the results of four experience sampling studies supporting these theoretical contentions. In Essay 1, I first validate a method to capture the “in situ” experiences of anxious and depressive states across two experience sampling methodology samples of college undergraduates. Stressful events created clinical state-levels of anxiety and depression, though mostly among those with high trait anxiety and depression. Next, I replicate and extend these findings among a sample of workers, observing also that negative events indirectly affect work goal progress, self-efficacy, and job satisfaction through anxiety and depression. In Essay 2, I extend the findings of the studies in Essay 1 to include a tragic event experienced vicariously at work. I report a natural experiment in which we found that a murder-suicide between colleagues increased anxious and depressive states among coworkers, even though participants did not witness the event firsthand. This relationship was strongest among employees with high trait anxiety. Increased state anxiety and state depression, in turn, were associated with reduced work goal progress. Results are discussed in terms of the challenges facing organizations, as well as the need for more research to determine effective interventions.

## DEDICATION

For Shae, Cheri, and Rob.

## ACKNOWLEDGEMENTS

I would like to acknowledge the amazing support of my dissertation committee:

Russell Cropanzano, <i>Chair</i>	University of Colorado, Boulder
Sabrina Volpone	University of Colorado, Boulder
David Hekman	University of Colorado, Boulder
Ksenia Keplinger	Max Planck Institute, Stuttgart, Germany
Mark Meany	University of Colorado, Boulder

I could not have completed this work without fantastic colleagues, advisors, and mentors whose advice made this research better. This includes everyone on my committee and so many more. A special shout out to Russell Cropanzano. Thank you for being the best chair any doctoral student could hope for. Sabrina Volpone, thank you for your mentorship and sharing all of your tacit knowledge about research and success in academia. Jessi Rivin, your insight and drive to always push forward on research is inspiring. To all my other colleagues and mentors, past and present, you played a key role in my growth as a researcher that will never be forgotten. A huge thanks to all my friends and family who listened to me discussing research methods and philosophy of science over the last several years. Your patience was noted and appreciated. Lastly, I would like to acknowledge Stata and coffee as key elements to my successful research endeavors.

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## Introduction

*“Anything that’s human is mentionable, and anything that’s mentionable can be more manageable. When we can talk about our feelings, they become less overwhelming, less upsetting, and less scary.”* –Fred Rogers

Emotions are at the heart of employees’ daily work lives (Weiss & Cropanzano, 1996). Where emotions once stood as a superfluous research topic in organizational behavior, the role of emotions in the workplace has become *“de rigueur”* to scholars studying organizations (Ashkanasy & Doris, 2017, p. 68; Barsade, Brief & Spataro, 2003). Yet the field of management has devoted too little time to understanding emotional experiences that verge upon the taboo (Fullmer & Jones, 2018), those experiences of mental illness that clinical psychologists readily acknowledge as having severe effects on all spheres of life, including the workplace (Barlow, 2015). There are logical reasons why the field of management has been hesitant to address emotional states that may enter the clinical range. Clinical levels of emotion are often associated with diagnoses that represent protected information under HIPPA. Individuals with diagnosed affective disorders are classified as “mentally impaired” and protected under the 1990 Americans with Disabilities Act. Stigma against depression and anxiety results in underreporting (Bharadwaj, Pai & Suziedelyte, 2017), a lack of training, and failure for employees to seek assistance when they are suffering (Jorm, 2000).

On the other hand, mental illness in the workplace is a research topic that sells itself. Mental illness is an extremely expensive phenomenon. Between 2010 and 2030 an estimated 12 billion workdays will be lost to mental illness every year (Patel et al., 2018). Globally, the annual economic burden of anxiety and depression is \$1 trillion in lost productivity (Sime, 2019). By 2030, the annual cost of mental illness to the global economy is predicted to be \$6 trillion (Bloom et al., 2012). Indeed, mental illness is pervasive in modern organizations despite not

being widely studied (Fullmer & Jones, 2018). Approximately 40 million adults in the United States suffer clinical levels of anxiety, while over 16 million adults suffer from clinical depression (ADAA, 2020). Globally, the number of individuals affected by clinical depression and clinical anxiety sum to the hundreds of millions (NIMH, 2020). Clearly, these phenomena are impacting employees and workplace outcomes, yet to date, the field has not reconciled emotions such as clinical anxiety and clinical depression, which exist beyond the scope of what is traditionally studied in management research. A person-centric approach examining the lived, “in situ” experiences of anxiety and depression is necessary to fully grasp the complex, dynamic nature of emotion disorders at work (Follmer & Jones, 2018).

Unsurprisingly, the study of affect has transformed since the 1970s, when Weick asked “Where is the Heat?” in management scholarship (Ray, 1995). Nonetheless, the field of management has failed to develop a theoretical framework to better understand clinical emotions and their role in organizations. In 1986, Frijda defined emotion as the experience of a form of biological response to environmental stimuli which result in physical and psychological changes and subsequent behavioral readiness. Critically, individuals with anxiety and depression tend to feel emotion which exists outside of the normal range (Quelch & Knoop, 2009). Thus, it may be the case that research on emotion has underestimated the effects negative emotions can have on workplace outcomes. Given the number of individuals who experience such severe levels of emotion, it is puzzling, then, that so little attention has been given to employees with mental illness, and the emotions they experience. Whereas extant research generally focuses on psychological phenomena at a sub-clinical level such as negative mood, stress, or general well-being (cf., Barling et al., 2009), this paper aims to provide a theoretical framework for research on mental illness at work by uniting literature from clinical psychology with management

research on emotions. Specifically, by following the framework of affective events theory (AET) developed by Weiss and Cropanzano in 1996, we integrate a theoretical platform for the study of mental illness in the workplace.

According to AET, events happen in the workplace which cause individuals to experience affective reactions. In turn, these affective reactions affect job outcomes, including attitudes, perceptions, and behaviors. Employees with clinical anxiety or clinical depression may experience a variety of symptoms such as: feeling restlessness, fatigue, irritability; having difficulty focusing or controlling feelings of worry; mind going blank, slowed thinking, feelings of worthlessness or guilt; and a loss of interest or pleasure in activities (NIMH, 2020; Mayo Clinic, 2018). These experiences can become so severe that normal day-to-day functioning becomes untenable (Smith, 2013), performance is reduced (Kessler, 2004), and goal progress is interrupted (Street, 2002), while the individual's perception of their own ability is likewise attenuated (Lewinsohn, Mischel, Chaplin, & Barton, 1980). These are but a few of the workplace outcomes of clinical anxiety and depression, the two most common mental illnesses afflicting an extensive population of employees regardless of age, race, religious and socioeconomic categories (Kessler, et al., 2005).

AET is uniquely suited to the present study of mental health in the workplace for three reasons. First, AET is fundamentally a process model that explains how employee attitudes and behaviors are driven by events and emotions unfolding over time. Under AET, events are defined as discrete happenings “which occur in a specific place during a particular period of time” (Weiss & Cropanzano, 1996, p. 31). Second, according to AET, understanding the role of affect in the workplace is not so simple as measuring emotional states and their antecedents: what must also be considered are the ways in which individual differences serve as boundary conditions

(Morgeson, Mitchell, & Liu, 2018). AET incorporates this into its theoretical structure, going as far as requiring that multiple levels of analysis be considered (Beal & Weiss, 2005). In particular, this necessitates repeated measurement of participants (Beal et al., 2013). Certainly, individual differences as well as time interdependent effects require data and statistical techniques which are costly to obtain (Shafer & Walls, 2006). Third, AET focuses on the “structure, causes and consequences of affective experiences at work” (Weiss & Cropanzano, 1996, p. 11). At first glance, this focus on structure of affective experiences at work seems to preclude the exploration of mental illness, which, by definition, falls outside the range of normal emotions (DSM-V, 2013). However, the focus on structure inherent to AET suggests the opposite. The exploration of affective experiences of employees with anxiety and depression, representing theoretical variance beyond the boundary of traditional research on emotions, is a logical extension of understanding emotion at work. To date, no study has examined clinical anxiety and depression within an AET framework.

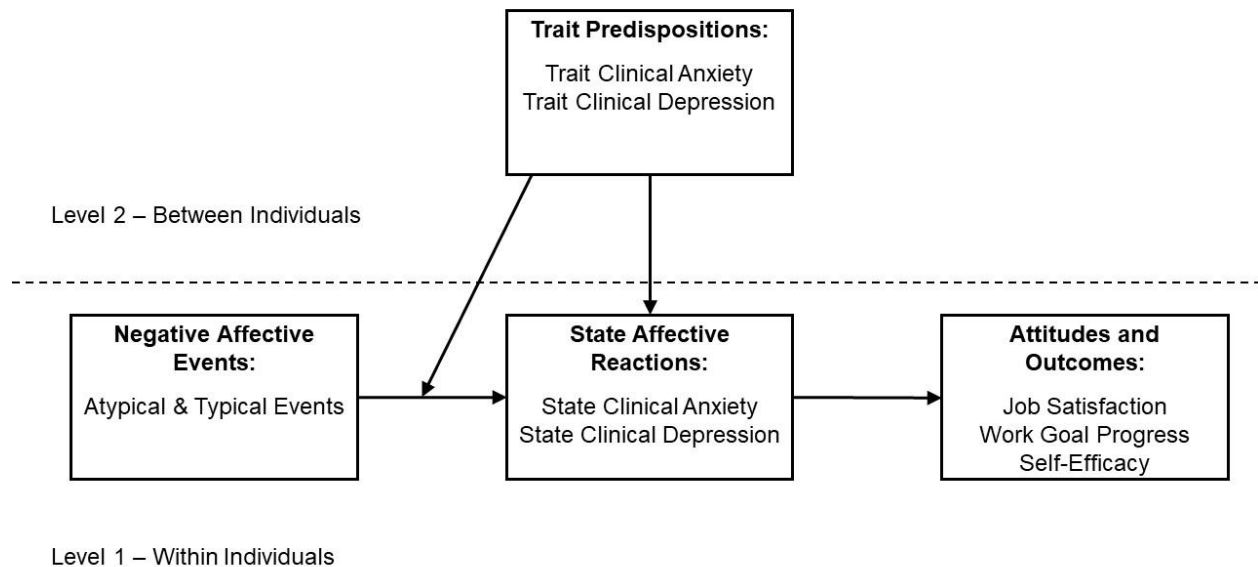
Across four studies we test a model of affective events focusing on clinical emotions at work. Data are tested in stages (Chatman & Flynn, 2005). First, we identify and capture the “in situ” experiences of anxiety and depression and their antecedent events across two experience sampling method (ESM) samples of college undergraduates. Specifically, we measure every-day, typical workplace events and their subsequent effect on state anxiety and depression (Study 1A). We replicate this effect, instead capturing atypical workplace events which are novel, critical, and disruptive (Morgeson et al., 2018) and extend the model to include two outcomes, work goal progress and self-efficacy (Study 1B). Second, the findings from Studies 1A and 1B are replicated and extended to test the indirect effect of events on employee job satisfaction, self-efficacy, and progress towards work goals (Study 2). Finally, the results of a field study of

employees working at a healthcare organization are reported (Study 3). Study 3 builds on the previous two studies by examining an objective event that was experienced by certain participants but not others (murder-suicide between married colleagues).

Figure 1 illustrates the theoretical model under investigation in this dissertation (Weiss & Cropanzano, 1996). Each of the studies iterate on the model below using intensive longitudinal data (Beal, 2015). In all studies, workplace events, state symptomology and outcome measures are measured through ESM surveys. Trait depression and anxiety are measured through a pretest administered prior to ESM data collection.

**Figure 1**

*An Affective Events Model of Mental Health at Work*



## Expanding Affect to Include Clinical Emotions

Following decades of disregard, research on emotions in organizational psychology and organizational behavior has dramatically transformed since the 1990's (Barsade, Brief & Spataro, 2003; Brief & Weiss, 2002; Ashkanasy & Dorris, 2017). During this transformation, most research has categorized emotions into positive and negative dimensions, with a separate stream of research exploring specific discrete emotions that exist within the “normal range” (Dyck, Jolly, Kramer, 1994; Brief & Weiss, 2002). Recently, there has been increasing recognition that life at work consists of more than the typical affective states emphasized by organizational behavior researchers. Indeed, clinical mental disorders, generally, and affective disorders such as clinical anxiety and clinical depression, specifically, have remained largely absent from organizational behavior research (Follmer & Jones, 2018).

As Follmer and Jones (2018) review, the constructs of anxiety and depression are not new in our literature—we in fact have an entire journal, *Work and Stress*, dedicated to understanding distress in individuals at work. However, distinguishing these experiences at clinical levels remains elusive, and a consistent theoretical and methodological paradigm for such research is yet to be seen (Brief & Weiss, 2002). In the following pages we adapt and test a model of affective events theory, which is then applied to the clinical context. In this model we consider two questions: 1) What happens to those employees whose affective states are in fact “abnormal”, or in the disordered range, when things happen at work? 2) How do situations and abnormal dispositions interact to harmoniously explain clinical emotion at work?

Originally a theory of job satisfaction, affective events theory has been expanded to become a useful conceptual tool for understanding workplace emotion (Cropanzano, Dasborough & Weiss, 2017). Fundamentally, AET is a person-centric model representing within-person

changes in affective states which are grounded in stochastic events, and their influences on parallel transitions in performance-related attitudes and behaviors (Beal & Weiss, 2005). Stochastic events are randomly determined events which may not be predicted precisely (Colman, 2015). Critically, the AET model has two elements that deserve more attention. First, the stochastic nature of events, ranging from regular, typical happenings to the atypical and disruptive, provokes a wide range of affective experiences. Some of these states have yet to be fully considered in our field – specifically clinical emotions. Second, the focus on within-person changes in affective states does not diminish the importance of individual differences. Quite the opposite, in fact. In its original presentation, AET was clear that individual differences matter. Specifically, AET recognizes that individuals each have a disposition or proneness to experiencing certain affective states (Weiss & Cropanzano, 1996).

Three central conceptual ideas make up the backbone of AET and are detailed here, as they are essential to incorporating clinical affect into affective events theory. First, emotions, at clinical or non-clinical levels, are states that vary within individuals over time (Weiss, 2002). Underlying this rather intuitive statement is the more novel idea that affective states have an immediate cause, situated in space and time. Rather than focus on how relatively *stable* features of a work environment relate to *unstable* affective states, AET instead models a sequence of constructs which are of consistent types within a temporal framework. At its core, AET explains the proximal causes of changing affective states. The key idea being that of change. Not only do affective states change, so, too, do their proximal causes (Cropanzano, Dasborough & Weiss, 2017). Both the immediate cause and the affective state unfold dynamically as individuals navigate their day-to-day work life. Intuitively, this makes sense—something happens at work and individuals feel a certain way as a result. Throughout this manuscript, we focus on the



relationship between workplace events—some subjective and others objective—and changes in clinical affective states (Weiss & Cropanzano, 1996).

Second, individual differences result in a lawful range of potential emotional states any one person may experience in response to an event. As a result, affective states can show regular patterns. This is an important distinction, which should remain inextricably linked in any theoretical explanation of unstable affective states. Individuals are predisposed to feel certain ways, triggered by events at work in real time. In the wake of an event, an individual experiences a deviated feeling state for a period of time and then returns to their “normal” level. This is supported by the basic logic of dispositional approaches of workplace emotion (Grandey, Tam, & Brauburger, 2002), which state that, to a greater or lesser degree, an individual has a general tendency to feel a certain way, independent of positive or negative environmental features. Similarly, in its original form, AET presents a model in which both situations and dispositions simultaneously explain the underlying process of workplace emotion. What is less obvious, however, is that by remaining within the realm of normal emotional dispositions like extraversion or neuroticism (e.g., Rodell & Judge, 2009), as well as the normal range of discreet emotions, we are missing a piece of the puzzle of emotions at work.

Importantly, this omission of abnormal traits or dispositions is not solely present in the literature on workplace emotion. Clinical symptomology of mental health is rarely included as an outcome or independent variable in the organizational literature (Follmer & Jones, 2018), despite the hefty monetary cost of mental illness to organizations. Critically, it is unlikely that all workers will be affected to the same degree by any specific event. This becomes clear considering that between 19% and 8% of the American population have been diagnosed with an anxiety or depressive disorder, respectively, in the last year (ADAA, 2019; NIMH, 2019). These

disorders have the propensity to affect an individual's lens on their experiences, and in some cases distort interpretations of events in maladaptive ways (Nolen-Hoeksema, Parker, & Larson, 1994). Further, persons who are prone to anxiety or depression show more intense reactions to stressful events (e.g., Boffa et al., 2016; Morrill et al., 2008). In other words, anxiety and depression are unfortunately common at work, more likely to manifest depending on certain dispositional characteristics largely absent from our literature, and can have important effects on employee thoughts, feelings and behaviors while at work.

Third, applying AET to clinical emotions and abnormal, clinical traits provides a unique test of the AET model. Affect under AET holds a specific function different from other evaluative judgements, such as effectiveness and attitudes. Specifically, emotion is an affective state that people experience, and job satisfaction is the evaluative judgment (attitude) people develop (Weiss & Cropanzano, 1996). This distinction is especially important when considering disordered affective states. One's state experiences of affect and concurrent attitudes and performance-related behaviors are separate, holding unique but interrelated places in the nomological network of both anxiety and depression. In considering abnormal traits and emotions, AET facilitates a robust test using measures explicitly validated to capture clinical levels of dispositional and state affect, with clearly designated cutoffs developed in the field of clinical psychology. As such, AET can focus on more extreme and, indeed, disordered levels of emotions and their concurrent effects at work.

Provided the above concerns, it seems rather puzzling that AET has not yet been used to consider clinical emotions at work, either in terms of individual differences (trait anxiety and trait depression) or feeling states. If anything, we believe AET provides a more robust model when considering abnormal traits and feeling states. In doing so, we highlight the lack of

conceptual tools we as organizational scholars have to explain the affective experiences of those individuals at work who are predisposed to clinical ranges of emotion. As we point out, our field has effectively omitted, at worst, or ineffectively explained, at best, an entire range of emotional experiences people have at work—ffective states which research from psychology repeatedly show us many people are predisposed to experience.

In particular, this research focuses on two clinical emotions, anxiety and depression, and does so from both a dispositional and a situational perspective. People with anxiety may experience sweating, trembling, having a sense of impending danger or doom, and may be unable to concentrate on anything other than the present worry (NIMH, 2020). This can result in the urge to avoid stimuli that trigger anxiety. People with depression may experience a sad or pessimistic mood, feelings of hopelessness or worthlessness, decreased energy, trouble thinking, and a loss of interest or pleasure in activities (NIMH, 2020). Similar to the field’s research on dispositional affect, we present here that dispositional *clinical* affect is demonstrated by individuals’ general tendency to experience clinical anxiety or depression in a stable manner over time. In this dissertation, we develop and test a multilevel process model of affective events which applies to clinical symptomology of anxiety and depression at work. Critically, this model includes both dispositional and situational relationships, with events measured proximally to their concurrent affective states and performance-related attitudes and behaviors.

To summarize, affective states are a result of proximal events and vary within persons over time. However, individual differences result in specific patterns of changing feeling states. When considered together, we are presented with a multilevel process model of emotions in the workplace. This creates the core of AET and is situated in the realm of person-centric theorizing (Weiss & Rupp, 2011; Morgeson, Mitchell, & Liu, 2018). While the stochastic process of events

unfolding over time at work is partially a function of environmental features (Morgeson, Mitchell, & Liu, 2018), AET instead focuses on individuals' lived experience at work through individual differences and within-person changes in affect states. This research makes three contributions to the literature on workplace emotion. First, it incorporates abnormal, clinical traits and states into the scholarship on workplace emotion. Second, it provides a person-centric theory test (Weiss & Rupp, 2011). Third, it examines events which are stochastic in nature, ranging from high probability of occurrence to low probability of occurrence, using both subjectively reported and objectively observed variables to provide a strong test of AET in a clinical context.

This dissertation shows that negative work events can result in clinical anxiety and depression at work. We expand AET to include emotion-based mental illnesses and show that employees' state anxiety and depression can extend beyond the normal range when negative work events take place. As a result of individuals' increased state anxiety and depression, we see a decrease in state job satisfaction, self-efficacy, and work goal progress. As predicted by AET, we show that these effects are much more pronounced in individuals prone to anxiety and depression. Further, our study shows that participants reported symptomology, both in the trait and state level measures, which exceed the normal range and are above widely accepted cutoffs to be considered severe anxiety and depression symptoms. We hope our research highlights the value of studying clinical anxiety and depression at work utilizing an AET conceptual framework, and that future researchers continue to examine these understudied, albeit common and costly, experiences at work.

## **Essay 1: An Affective Events Perspective on Anxiety and Depression at Work: Two ESM Studies**

Over the past three decades, management scholarship has transitioned into an “affective era” (Barsade, Brief, & Spataro, 2003, p. 3; Brief & Weiss, 2002). During this affective revolution, most of the research in this area has focused primarily on positive and negative affect, with a separate stream of research exploring discrete emotions that exist within the “normal range” (Dyck, Jolly, Kramer, 1994). While the renewed appreciation for affect should be celebrated, extant research has failed to include an important subset of individuals and affective states that are common at work—clinical levels of anxiety and depression (Follmer & Jones, 2018). The limited consideration devoted to clinical anxiety and depression is an unfortunate oversight for a number of reasons.

First, these clinical conditions are responsible for much human suffering and deleterious to organizational effectiveness. Employees with clinical anxiety may feel restless, on-edge or wound-up, and irritability. They may also have difficulty focusing or controlling feelings of worry, and have muscle tension throughout the day (NIMH, 2020). While moderate levels of anxiety might be motivating, clinical anxiety tends to make concentration challenging and thwart self-regulation, thereby lowering task performance (Yip, Levine, Brooks, & Schweitzer, in press). Likewise, employees with depression may experience a sad or “empty” mood, feelings of hopelessness or pessimism, decreased energy or fatigue, and a loss of interest or pleasure in life activities (NIMH, 2020). These feelings can interrupt goal progress (Street, 2002) and attenuate self-efficacy (Lewinsohn, Mischel, Chaplin, & Barton, 1980). As a result, individual and workgroup performance can be impaired (Asami, Goren, & Okumura, 2015; Berndt, Finkelstein,

Greenberg, Howland, Keith, Rush, & Keller, 1998; Harvey, Glozier, Henderson, Allaway, Litchfield, & Holland-Elliott, & Hotopf, 2011).

Second, anxiety and depression are very widespread, much more so than is commonly recognized. Available evidence indicates that the lifetime prevalence of any Anxiety Disorder is 31.6%, and 7.1% of US adults suffer from Major Depression each year (NIMH, 2020). Globally, the number of individuals affected by a mental disorder is almost 1 billion, with the majority of those cases being anxiety and depression (WHO, 2020). There is also evidence that anxiety is increasing in some nations (Booth, Sharma, & Leader, 2016; Twenge, 2000), though it is not clear whether this is the case for depression (Anderson, Thielen, Bech, Nygaard, & Diderichsen, 2011; Patten, Williams, & Lavorato, 2015). Many people with these mental health challenges hold jobs. For example, Wulsin, Alterman, Bushnell, Li, and Shen (2014) examined over 200,000 insurance cases from employers in Western Pennsylvania, finding substantial rates of depression. These varied by industry, from a low of 6.87% among employees in amusement and recreation services, to a high of 16.19% among transportation workers.

Third, anxiety and depression have serious financial consequences, costing the economy billions of dollars each year. From 2009-2010, anxiety disorders were estimated to cost the United States economy about \$33.71 billion, expressed in 2013 dollars (Shirneshan, Bailey, Relyea, Franklin, Solomon, & Brown, 2013). Depression, though less common, appears to be even more deleterious. By 2005, major depression was estimated to cost the United States economy about \$173.2 billion, rising to \$210 billion by 2010 (Greenberg, Fournier, Sisitsky, Pike, & Lessler, 2015). Critically, individuals with anxiety and depression tend to feel negative emotions that peak outside of the ordinary range (Quelch & Knoop, 2009). As current research

has emphasized normal affect, it may be the case that it has underestimated the impact that clinical emotions can have on workplace outcomes.

Anxiety and depression are clearly important phenomena with significant economic and human costs. Yet to date, the field has not reconciled clinical emotions, which exist beyond the scope that has traditionally studied in management research. Most of the available evidence has been collected by public health and medical scholars (e.g., Konnokpa & König, 2020), and we will review this evidence here. Public health research is often correlational and cross-sectional, sometimes de-emphasizing work-relevant outcome measures (Quelch & Knoop, 2018).

Available studies also emphasize the trait-like expression of anxiety and depression, which is relatively stable. Less attention has been paid to daily fluctuations in clinical emotions (for an exception, see Wang et al., 2004). This is unfortunate, as between 40 – 70% of people report daily anxiety that can interfere with their lives (Cheng & McCarthy, 2018), while depressive episodes contribute to performance deficits and absenteeism (Lerner & Henke, 2008).

Given the number of individuals who experience such severe levels of emotion, it is puzzling that so little attention has been given to emotionally-based mental illness. One can imagine various reasons why the field of organizational behavior has been hesitant to study anxiety and depression. For example, management scientists seem to have informally delegated mental health issues to their counterparts in clinical psychology and psychiatry, perhaps becoming unaware of their impact. However, we suggest that the matter is more straightforward. Organizational behavior appears to lack a theoretical and methodological paradigm for conceptualizing and studying clinical levels of emotion. To remedy this, we argue that our existing theories of sub-clinical emotions can be applied to clinical-level feeling states. In taking this approach, we aim to provide a theoretical framework for mental illness at work, which

integrates literature from clinical psychology with management research on emotions. As discussed by Rodell and Judge (2009), affective events theory (AET; Weiss & Cropanzano, 1996) suggests both a theoretical platform and methodological recommendations for studying clinical emotions at work.

Unlike most other theories of workplace emotion, AET is a process model. Rather than concentrating on relatively stable features of the job, such as pay level or intragroup relationships, AET emphasizes the affective consequences of transitory workplace events. These affective events, defined as discrete happenings “which occur in a specific place during a particular period of time” (Weiss & Cropanzano, 1996, p. 31), may appear random. However, they impact workers’ feeling states and, as such, can produce lawful changes in their emotional states. In turn, these affective reactions affect job outcomes, including attitudes, perceptions, and behaviors. In order to incorporate stochastic events into empirical investigations, multiple levels of analysis should be considered (Beal & Weiss, 2003). In particular, this necessitates repeated measurement of participants using such approaches as ESM (see Beal, Trougakos, Weiss, & Dalal, 2013).

AET has an additional strength, which can expand conceptual thinking about clinical workplace emotions. In a departure from previous theoretical thinking, AET further suggests that trait anxiety and trait depression could interact with workplace events (Cropanzano, Dasborough, & Weiss, 2017). As alluded to previously, available studies of workplace anxiety and depression have often focused on the trait-like or stable expression of these constructs. While AET agrees that trait diagnoses are important, these are only part of the story. Following from AET, we conceptualize the trait levels of anxiety and depression as individual predispositions. These tendencies, in turn, dispose individuals to be more or less responsive to workplace events



(Morgeson, Mitchell, & Liu, 2018). The resulting interactions create anxious and depressive states, respectively. For example, a failure experience will generate more sadness among those with high trait depression and less sadness among those with low trait depression.

Across three studies we test this interactive model of affective events focusing on clinical emotions at work. Data are tested in stages (Chatman & Flynn, 2005). First, we identify and capture the “in situ” experiences of anxiety and depression and their antecedent events across two ESM samples of college undergraduates. Specifically, we measure everyday workplace events and their subsequent effect on state anxiety and depression (Study 1A). We then conduct a conceptual replication, capturing atypical workplace events that are novel, critical, and disruptive (Morgeson et al., 2018). We also extend the model to include the outcomes of work goal progress and self-efficacy (Study 1B). In a second study, the findings from Studies 1A and 1B are again replicated and extended in a work sample. In Study 2, we explore the indirect effect of events on employee job satisfaction, self-efficacy, and progress towards work goals.

This research makes three contributions to the literature on workplace emotion. First, we expand AET, using this conceptual model as a framework for considering the clinical anxiety and depression within the workplace. Second, we examine stochastic events (ranging from high probability of occurrence to low probability of occurrence), using both subjectively reported and objectively observed variables to provide a strong test of AET in a clinical context. Third, and further building from AET, we argue that these events interact with anxious and depressive predispositions to generate clinical emotions.

## **Theory and Hypothesis**

### **Affective Events Theory**

In light of the recognition that all affective states have unique and important implications for employee behavior (Weiss, Suckow, & Cropanzano, 1999; Scott & Judge, 2006), it is puzzling then that we do not have a theoretical framework to understand how clinical levels of certain negative emotions influence organizational life. As Follmer and Jones (2018) review, the constructs of anxiety and depression are not new in our literature. However, distinguishing these experiences at clinical levels remains elusive, and a consistent theoretical and methodological paradigm for such research is yet to be seen (Brief & Weiss, 2002). Affective events theory is a person-centric model representing within-person changes in affective states that are grounded in stochastic events (Beal & Weiss, 2005; Cropanzano et al., 2017). Two central conceptual ideas make up the backbone of AET and are detailed here, as they are central to incorporating clinical affect into affective events theory.

First, emotions, regardless of whether they are at clinical or non-clinical levels, are states that vary within individuals (Rodell & Judge, 2009; Weiss, 2002). Underlying this rather intuitive statement is the more novel idea that affective states have an immediate cause, situated in space and time. Rather than focus on how relatively stable features of a work environment relate to individuals' unstable affective states, AET instead considers stochastic events, ranging from regular, typical happenings to the atypical and disruptive. These may provoke a wide range of affective experiences, including but not limited to clinical emotions. In this way, AET explains the proximal causes of changing affective states. Not only do affective states change, so too do their proximal causes (Cropanzano et al., 2017). Both the immediate causes and the affective state unfold dynamically as individuals navigate their day-to-day work life. In each of the present

studies, we focus on the relationship between workplace events, some subjective and others objective, and the resulting changes in clinical affective states. Doing so, requires the use dynamic data collection methodologies, such as experience sampling methodology (ESM, Weiss & Cropanzano, 1996).

Second, AET presents a model in which both situations and dispositions simultaneously explain the underlying process of workplace emotion. According to AET, the focus on within-person changes in affective states does not diminish the importance of individual differences, quite the opposite, in fact. AET recognizes that individuals each have a disposition or proneness to experiencing certain affective states (Weiss & Cropanzano, 1996). Critically, it is unlikely that all workers will be affected to the same degree by any specific event. Further, persons who are prone to anxiety or depression are anticipated to show more intense reactions to stressful occurrences (e.g., Boffa et al., 2016; Morrill et al., 2008). In other words, anxiety and depression, which are unfortunately common at work, are more likely to manifest depending on certain dispositional characteristics that have been largely absent from our literature. These, in turn, can have important subsequent effects on employee thoughts, feelings and behaviors.

Given the above considerations, it seems rather puzzling that AET has not been widely used to consider clinical emotions at work, either in terms of individual differences or feeling states, much less to both (for a partial exception, see Rodell & Judge, 2009). If anything, we believe AET becomes even more robust when considering traits and feeling states. In doing so, we highlight the lack of conceptual tools available to organizational scholars who wish to explain the affective states of those individuals who are predisposed to clinical ranges of emotion. As a field, we have effectively omitted, at worst, or ineffectively explained, at best, an entire range of emotional experiences people have at work.

## Anxiety

According to the American Psychiatric Association (2000, p. 820), anxiety is defined as the “apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic feelings of tension.” Anxiety includes both a negative valence, as it is experienced as unpleasant, along with high energy, as it is a feeling of activation (Yip et al., in press). Various features of the working environment make anxiety more likely. For example, a flat organizational structure was reported to reduce anxiety levels among salespeople (Ivancevich & Donnelly, 1975). Likewise, Doby and Caplan (1996) observed that employees reported more anxiety at home and on the job when they experienced stressors that threatened their status at work. This included such things as inadequate feedback, poor training, role overload, and role ambiguity. Tepper (2000) observed higher anxiety among workers who had been subjected to abusive supervision. Yip et al. (in press) present evidence that organizational culture can contribute to anxiety. According to their theory, anxiety is most likely among cultures that are results-oriented, of weak intensity, lack consensus, and are not a good match for the worker (for generally supportive evidence, see Baltis, 1980). While these findings are consistent with AET, they do not directly test whether affective events increase anxiety. Fortunately, other evidence suggests that this is the case. Rodell and Judge (2009) directly examined AET in a three-week ESM study. Consistent with their hypotheses, Rodell and Judge found that daily levels of challenge and hinderance stressors boosted anxious states. These states, in turn, were associated with less citizenship and more counterproductive work behavior. From this follows our first hypothesis.

*Hypothesis 1: Negative workplace events are positively related to state anxiety.*

As we have already discussed, anxiety can be both “dispositional and situational,” as Cheng and McCarthy (2018, p. 539) observe. Likewise, Yip and his colleagues (in press) refer to “trait” and “state” anxiety (p. 13). In each case, the former refers to the long-term or chronic tendency to react to threats with fear and anxiousness. The latter refers to the short-term or acute affective experience. As people who are predisposed to anxiety (trait) may be more likely to experience these feelings in a particular situation (state), it is important to understand why this might be so. At least part of the reason can be found in the way that people high in trait anxiety process information. In general, anxious individuals tend to be more wary and cautious than are their low-anxiety counterparts. According to Cheng and McCarthy (2018), anxiety makes employees hypervigilant, attending more to feedback and taking fewer risks (Mannor, Wowack, Barkus, & Gomez-Mejia, 2016). Anxious individuals also tend to interpret ambiguous stimuli as threatening (Mathews & MacLeod, 2005; Zinbarg & Yoon, 2008). In general, trait anxiety is likely to make workers respond more strongly to events that are negative or otherwise threatening. From these cognitive tendencies follows the interaction predicted by AET:

*Hypothesis 2: Trait anxiety moderates the relationship between negative workplace events and state anxiety, such that state anxiety will be highest for individuals with high trait anxiety when an event takes place.*

Individuals high on trait anxiety exhibit better memory for threatening information (Coles & Heimberg, 2002). Consequently, they may recall negative events over time, exacerbating these negative states.

*Hypothesis 3: There are carry-over effects for anxiety. These result in greater anxiety on the following day.*

AET began its life as a theory of job satisfaction, arguing that fluctuating mood states could impact workers' evaluations of their work, thereby raising or lowering satisfaction (Weiss & Cropanzano, 1996). As anxiety involves uncertainty and worry about the present situation, then AET would anticipate that anxiety will tend to reduce job satisfaction. While previous work has usually treated anxiety and job satisfaction as correlates (e.g., Newbury-Birch & Kamali, 2001; Ivancevich & Donnelly, 1975), AET suggests that the former causes the latter. Available tests are limited, though there is some prior support for this idea. Demir (2018), who surveyed 355 teachers at 27 Turkish schools, reported that teachers' psychological capital was negatively related to anxiety, while anxiety was negatively related to job satisfaction. Demir interpreted these findings as evidence that anxiety can lower job satisfaction, which is consistent with AET.

*Hypothesis 4: State anxiety is negatively related to job satisfaction.*

At low or moderate levels, anxiety may boost job performance by energizing employees to work especially hard. At higher levels, such as the clinical anxiety examined here, work effectiveness is likely to fall off (Cheng & McCarthy, 2018). Notably, high levels of anxiety can dominate thinking, leading to cognitive interference that makes it difficult to self-regulate one's work behavior (Yip et al., in press). Moreover, anxiety is characterized by uncertainty regarding the future. When people feel anxious, they are apt to seek and use advice. However, they may become less careful in distinguishing the sound from the unsound recommendations (Gino, Brooks, & Schweitzer, 2021). Thus, it appears likely that self-efficacy will diminish as anxious states increase. Additionally, anxious people can feel emotionally depleted, exhausting their ability to direct high levels of effort toward their work (McCarthy et al., 2016). Hence, we expect that anxiety will be negatively related to work goal progress and to self-efficacy.

*Hypothesis 5: State anxiety is negatively related to (a) self-efficacy and (b) work goal progress.*

As we have seen, AET suggests that work events cause emotional states, including but not limited to anxious feelings. These emotional states, in turn, affect job satisfaction (Hypothesis 4), as well as work goal progress and self-efficacy (Hypothesis 5). In this regard, AET would posit that anxiety acts as a mediator between negative work events and these outcome variables (Rodell & Judge, 2009). We state this formally as a hypothesis:

*Hypothesis 6: State anxiety mediates the effect between events and workplace outcomes of (a) job satisfaction, (b) self-efficacy, and (c) work goal progress.*

As we indicated in our second hypothesis, AET maintains that affective traits, such as dispositional anxiety, interact with workplace events to produce anxious states. In this way, individual differences in anxiety moderate the antecedent properties of workplace events.

*Hypothesis 7: Trait anxiety moderates the indirect effect of events on workplace outcomes of (a) job satisfaction, (b) self-efficacy, and (c) work goal progress.*

## **Depression**

Depression can be defined as “a mood disorder characterized by an overwhelming sense of sadness along with inactivity, difficulty in thinking straight, uneven appetite, sleep disturbances, and feelings of dejection and hopelessness” (Shally-Jenson, 2019, p. 105). Though depression and anxiety tend to be highly correlated and share negative affect, there are also important differences between them (Clark & Watson, 1990; Freeman & Freeman, 2012). Depressed people report having low energy, feel worthless, and report a loss of pleasure in formerly enjoyable activities (American Psychiatric Association, 2000). Features of the work environment can cause employee depression (Johnson & Indvik, 1996). Ferguson, Frost, and

Hall (2012) reported that social stressors at work were associated with later depressive symptomology as much as eight months later. In their longitudinal study, Dormann and Zapf (1999) reported consistent results, though support from one's supervisor tended to ease these symptoms. Available research has tended not to examine affective events, though job loss may promote depression (Leana & Ivancevich, 1987). Following from AET and from this evidence, we predict the following:

*Hypothesis 8: Negative workplace events are positively related to state depression.*

Within the depression literature, more attention has been paid to depressive traits than to depressive states, though there is strong evidence for both. Endler, Macrodimitris, and Kocovski (2000) and Rosenbaum, Lewinsohn, and Gotlib (1996) present evidence suggesting that long-term predispositions, often characterized by dysfunctional thought patterns, are empirically distinguishable from shorter-term mood fluctuations (for additional evidence, see Campos, 2013). As with anxiety, it appears that individuals showing high levels of trait depression tend to process information in a manner that would aggravate the impact of unpleasant workplace events (Gotlib & Joorman, 2010). When compared to non-depressed individuals, those with depression tend to pay more attention to negative information (Mathews, Ridgeway, & Williamson, 1996). When exposed to negative stimuli, depressed participants are less able than non-depressed participants to inhibit their negative feelings (Hertel, 2004; Hertel & Gerstle, 2003; Joorman, 2004; Goeleven, DeRaedt, Baert, & Koster, 2006). Rather than disengaging, depressed individuals may ruminate on the disagreeable stimuli, elaborating on the event and making their moods even worse (Singer & Dobson, 2007). These cognitive tendencies could produce the interaction predicted by AET:



*Hypothesis 9: Trait depression moderates the relationship between negative workplace events and state depression, such that state depression will be highest for individuals with high trait depression when an event takes place.*

People high in trait depression also show greater recall of negative events (Mathews & MacLeod, 2005). This memory bias may make it more difficult for depressed people to recover from a distressing event (Joormann & Siemer, 2004; Walker, Skowronski, & Thompson, 2003).

*Hypothesis 10: There are carry-over effects for depression. These result in greater depression on the following day.*

As with other affective states, AET anticipates that negative emotions at work will be associated with diminished job satisfaction (Weiss, & Cropanzano, 1996). This seems to be the case with depression. Depressed people, who tend to lose pleasure in life activities (American Psychiatric Association, 2000), also report lower job satisfaction than do non-depressed individuals (e.g., Steyn & Vawda, 2014). Also consistent with AET, studies by Choi, Lee, Sim, Lee, and Park (2017) and (Ferguson et al., 2012) show that depression is negatively related to later job satisfaction.

*Hypothesis 11: State depression is negatively related to job satisfaction.*

Depression, with its feelings of despondence and despair, is likely to be associated with diminished self-efficacy and a lack of progress on work goals (Follmer & Jones, 2018). This is consistent with a large body of research from the mental health literature. Findings have shown that depressed, and especially severely depressed, employees have trouble achieving their performance goals (DeVries, Koeter, Nieuwenhuijsen, Hees, & Schene, 2015; Sallis & Birkin, 2014). Likewise, the sense of hopelessness that is part of depression also results in lower self-efficacy. This is so in a number of life domains (Kavanagh, 1992; Maddux & Maier, 1995).

*Hypothesis 12: State depression is negatively related to (a) self-efficacy and (b) work goal progress.*

As mentioned above, AET proposes that events cause affective states, such as depressiveness. These states, in turn, impact subsequent work outcomes (Weiss & Cropanzano, 1996). To date, evidence is limited, though tantalizing. Ferguson and her colleagues (2012) studied 274 Ontario schoolteachers. These researchers found that a high workload and ill-behaving students led to depression. Depression, in turn, lowered teacher job satisfaction. Similar findings were obtained by Choi et al. (2017). Based on AET, we extend this prediction to work goal progress and self-efficacy.

*Hypothesis 13: State depression mediates the effect between events and the workplace outcomes of (a) job satisfaction, (b) self-efficacy, and (c) work goal progress.*

Following from AET and also from our prior prediction, individual differences in depression are expected to moderate the impact of work events, such that negative events have a stronger impact for those high in trait depression and a weaker impact for those low in trait depression. By extension, the impact of this interaction on job satisfaction, work goal progress, and self-efficacy should be mediated by anxiety.

*Hypothesis 14: Trait depression moderates the indirect effect of events on workplace outcomes of (a) job satisfaction, (b) self-efficacy, and (c) work goal progress.*

## **Closing Thoughts**

Worker anxiety and depression are costly problems for work organizations and, perhaps even more importantly, are painful conditions for employees to endure. With important

exceptions, the organizational sciences have not yet devoted much research attention to understanding these two common mental health issues (Follmer & Jones, 2018; Quelch & Knoop, 2009). Given this lack of information, we propose to apply and test an affective events theory model of workplace mental health. To summarize our thinking, AET asserts that affective states result from the stochastic impact of proximal events (Beal & Weiss, 2005). These events are likely to vary within persons and over time, suggesting a person-centric methodology, such as ESM (Weiss & Rupp, 2011). However, individual differences are also critical, as these result in specific patterns of changing feeling states, especially among employees prone to anxiety and depression (Weiss & Cropanzano, 1996). While environmental features can be important distal causes of events (Morgeson et al., 2018), AET focuses on individuals' lived experience at work through individual differences and within-person changes in affective states.

### **Study 1A Method**

#### **Sample and Procedure**

We recruited participants for our experience sampling methodology study from a student subject pool of a university in the Western United States. To examine the proximal effects of events on anxiety and depression, each day was broken into three performance episodes—the morning, the afternoon, and the evening (Beal & Weiss, 2005). During each performance episode, participants reported events that took place and their state anxiety and depression. On average, participants' age was 19.48 ( $SD = 0.87$ ) and 40.26% of participants identified as female. The majority of participants identified as Caucasian (70.78%), (1.3%) identified as Black, (10.39%) identified as Asian, (9.74%) identified as Hispanic/Latino.

Prospective participants were told that the study would take place over five workdays (i.e., Monday through Friday for one work week), and that they would be asked to complete

three surveys a day in addition to a pretest. Interested participants signed up in groups of 15 to attend a 30-minute introductory meeting. During this meeting, participants completed a pretest and were provided detailed information from the researcher about the nature of the project and the time requirements it would take to complete the surveys. Participants were not required to complete all surveys to earn course credit. Credit was given based upon the number of surveys they completed, including a guaranteed minimum credit for showing up to the introductory meeting. In this sample 154 participants opted to complete the pretest.

Participants were emailed three experience sampling surveys a day. The morning survey was distributed at 8:00 a.m. Each assessed workplace events and state clinical emotions. We measured state clinical affect and negative work events at each time point throughout the workday (i.e., morning, afternoon, evening), instead of measuring it only a single time each day. This allows us to sample the affective events that occur during the workday and the associated “in situ” clinical emotions (Beal & Weiss, 2005). Participants were asked to complete this survey before they were sent the second survey of the day, or to skip the survey if they were unable to do so. On average, the morning survey was completed at 10:15 a.m. The second daily survey was distributed at 12:00 p.m. and assessed the same measures as in the morning survey. Similar to the morning survey, we asked participants to complete this survey prior to the final survey of the day, or to skip it entirely. On average, the afternoon survey was completed by 2:36 p.m. Finally, the third daily survey was distributed at 4:00 p.m. On average, the evening survey was completed by 7:19 p.m.

Each survey was left open after the administration of the subsequent daily surveys. However, those responses that were provided after the allotted performance episode had ended (i.e., morning responses that were provided after the afternoon survey was administered, etc.)

were dropped from analysis. Furthermore, evening assessments that were not completed during the evening and instead completed the following morning were likewise omitted if they were taken after the morning signal had been sent. We retained data from participants who completed at least three full days of sequential surveys (i.e., morning, afternoon, and evening surveys) to ensure that we had an adequate number of surveys to test our theoretical predictions (Beal et al., 2013; Hill, Matta, & Mitchell, 2020). In total, twenty-four participants took only the pretest or failed to complete enough consecutive surveys during the work week.<sup>1</sup> This resulted in a final sample 1,791 useable observations across 129 participants. The average number of observations per participant was 11.4.

To assess predispositions towards clinically anxious and depressive states, we used the Beck Depression Inventory-II (BDI) and the Beck Anxiety Inventory (BAI) (Beck, Steer & Brown, 1996; Beck & Steer, 1990). These scales are easily administered, widely used, and easy to interpret. They have also shown strong reliability and validity across languages, cultures, and age ranges, and serve as an effective pre-screening tool for clinical psychologists to determine the severity of anxious and depressive symptomology. Additionally, for depression, the second version of the scale was improved over the original to increase its correspondence with the Diagnostic and Statistical Manual-IV (Beck, Steer & Brown, 1996).

While a diagnosis cannot be made solely from the administration of survey measures such as the Beck Inventories, these measures' use as a first pass for clinicians to determine the severity of depressive and anxious symptomology is common. Furthermore, studies have shown the accuracy of cutoff scores in predicting clinical diagnoses across a variety of clinical contexts

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<sup>1</sup> Upon following up with these students, we learned that most who dropped out did so because they did not need the additional credits offered for full participation in the study. Instead, these students only needed a single credit, which was rewarded for taking the pretest. ANOVA results showed that there were no significant differences in the pretest measures between this group and the group of students who took daily surveys.

(e.g., Moullec et al., 2015; Baker, Moses, Russell, Russell, 2007; Kabacoff, Segal, Hersen, Van Hasselt, 1997). In addition to participant traits, we measured participants' state symptoms of anxiety and depression. For anxiety we used the state component of Spielberger's State Trait Anxiety Inventory (STAI-Y6; Marteau & Bekker, 1992). For depression, we use the depression subscale from the Depression, Anxiety, and Stress Scale (DASS; Lovibond & Lovibond, 1995). Like their counterparts which measure trait symptomology, the state measures for each clinical state have normalized cutoffs that have been used to determine the severity of anxiety and depression both in and out of clinical contexts.

Quite a few of our respondents reported clinical symptomology. For trait anxiety, approximately 51.95% of participants exhibited normal/minimal anxious symptomology, 20.13% reported mild symptoms, 16.23% reported moderate symptoms, while a full 11.69% reported severe symptoms. For trait depression, a total of 70.13% of our participants exhibited no/minimal trait depressive symptoms. However, 16.23% exhibited mild symptoms, 11.04% exhibited moderate symptoms, while 3.6% exhibited severe levels of depressive symptomatology. While these levels of anxiety and depression might appear high, they are in line with what would be expected for college students (for a thorough review, see Hibbs & Rostain, 2019). The percentage of students reporting high state anxiety and depression was also high. When it came to capturing state symptoms of anxiety and depression, for state anxiety, approximately 35.96% of all ESM observations were in the normal range, 18.03% were moderate, and 37.97% were very high or severe. For state depression, the pattern was similar albeit lower. Approximately 73.26% of all ESM observations were in the normal range, 7.83 % were mild, 13.2% were moderate, and 5.71% were severe.

## ***Measures***

Following best practices for field research with intensive longitudinal designs (e.g., Bolger, Davis, & Rafaeli, 2003; Gabriel et al., 2019; Hill et al., 2020; Rodell & Judge, 2009), we employed measures with fewer items to decrease survey fatigue. If available, we used scales that had been shortened and validated for ESM studies to capture affective states, perceptions, and workplace outcomes. In the case where established measures were not available, we adapted our instruments to the immediate context by changing item stems to include language such as “right now, in the present moment.”

**Typical Work Events.** Minor irritants and everyday work events were measured using the hassles component of the Hassles and Uplifts Scale (DeLongis, Folkman, & Laarus, 1988). This scale was developed and validated for experience sampling studies. The instrument captures minor irritants and common hassles that individuals experience throughout their workday. The Hassles and Uplifts scale was specifically designed to capture stressors separate from somatic symptoms of mental health and has been adapted to workplace settings (e.g., Bono et al., 2013). The scale has been shown to be predictive of changes in health and affect over time. The scale consisted of 26 short items. Each item was rated on the extent to which it was a hassle since the previous survey on a 4-point scale (0 = *none or not applicable*, 3 = *a great deal*;  $\alpha = 0.94$ ).

**Trait and State Anxiety.** To measure trait anxiety, we administered the BAI (Beck, Epstein, Brown, & Steer, 1988). The Beck Anxiety Inventory is a reliable and validated scale used by clinicians to measure self-reported anxiety. The scale ranges from 0 to 3 and is calculated using a total score ( $\alpha = 0.93$ ). Validated cutoffs exist to aid clinicians in assessing the severity of anxiety. A total score of 0-7 is normal/minimal, 8-15 is considered mild, 16-25 is considered moderate, and 26-63 is severe (Beck & Steer, 1990).

To measure state anxiety in our ESM surveys, we employed the state component of the short form of state trait anxiety inventory STAI-Y6 (Marteau & Bekker, 1992). The STAI has been used extensively in research and clinical practice. The S-Anxiety scale (STAI Form Y-1) consists of six statements that evaluate how respondents feel “right now, at this moment.” Example items include, “I feel upset,” “I am tense,” and “I am worried.” Likert responses range from 1 to 4 ( $\alpha = 0.79$ ). To interpret this measure, the sum of the responses is divided by six and multiplied by twenty, for a final score ranging from a minimum of 20 to a maximum of 80 (Marteau & Bekker, 1992; Van der Bij, de Weerd, Cikot, Steegers, & Braspenning, 2003). Like the Beck Anxiety Inventory, there are commonly accepted cutoffs for the STAI. A score between 20-37 indicates normal/minimal anxiety, 38-44 indicates moderate anxiety, and 45-80 severe anxiety (e.g., Jjala, French, Foxall, Hardman, & Bedfordth, 2010). As originally designed, a general cutoff of 40 is considered the level at which clinically diagnosable levels of anxiety are being reported by respondents (Spielberger, Gorsuch, & Lushene, 1970).

**Trait and State Depression.** To measure trait depression, we use the 21-item Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996). The item values range from 0 to 3. One item referring to suicidality was removed from the scale prior to administering the survey in accordance with IRB. The instrument is scaled as a total score with a range of 0-63 ( $\alpha = 0.93$ ). In 1996, the original Beck Depression Inventory was improved to increase its correspondence with the Diagnostic and Statistical Manual-IV (Beck, Steer & Brown, 1996). Like anxiety, there are validated cutoffs that clinical psychologists use to aid in assessing the severity of depression. The criteria are as follows: 0-13 normal/minimal, 14-19 is mild, 20-28 is moderate, 29-63 is severe (Beck, Steer & Brown, 1996).



To measure state depression, we used seven depression items from the Depression Anxiety Stress Scales (DASS), a scale regularly administered in clinical and non-clinical contexts. Participants were instructed to report feelings “right now, in this moment.” Sample items include “I feel down-hearted and blue” and “I feel I have nothing to look forward to.” The item values range on a Likert scale from 1 to 4 ( $\alpha = 0.94$ ). Similar cutoffs exist for this scale to assess the severity of depressive symptomology. A score of 0-9 is normal/minimal, 10-13 is mild, 14-20 is moderate, 21-27 is severe and 28+ is considered extremely severe (Lovibond & Lovibond, 1995).

**Controls.** As an intensive longitudinal design, data collected via ESM are measured within a short period of time. This requires the use of multilevel modeling and autoregressive techniques to address issues of non-independence (Shafer & Wells, 2006). In combination, multilevel and time series statistical techniques account for the nested and longitudinal nature of the ESM data (Beal, 2015). For example, the time interdependence of the data call for time series techniques to account for the component of our dependent variables at time  $t$  which “carry over” or have “inertia” into to time  $t+1$ . Likewise, repeated measures of participants call for multilevel techniques given that the data are nested within individual participants, where some participants may start high and remain high while others do not. Both cases violate the independent and identically distributed (IID) assumption of the general linear model (GLM) and require appropriate statistical tools to account for interdependent observations (e.g., Shafer & Walls, 2006; Gabriel et al., 2019). Using a mixed effects model with autoregressive residuals disaggregates the observation level effects (Level-1) and the individual level effects (Level-2) which may be correlated across predictors and time.

Additionally, to better establish presumed causal ordering, we also control for the autoregressive parameter,  $\rho$ , capturing the “inertia” of our affective states over time. This allows us to adjust the standard errors of our coefficients to better test the causal relationships between events and affective states. Finally, we controlled for cyclical patterns in daily states by modelling the day of the week as the cosine of this daily variable (e.g., Beal & Weiss, 2003; Gabriel et al., 2019). Such cyclical fluctuations throughout the work week have been shown to influence employees’ affective states, perceptions, and work behaviors (e.g., Barnes, 2012; Baumeister et al., 2016). The results of our hypothesis tests are unchanged when control variables are omitted. We report results which include all controls to provide more robust support for our predictions.

## **Study 1A Results and Discussion**

### **Descriptive Statistics and Correlations**

The means, standard deviations, reliabilities (averaged across days), and within- and between-person correlations for Sample 1A are reported in Table 1. The correlations of typical negative work events with state anxiety and depression were positive and significant, lending initial support for our theoretical predictions. As the within-person correlations suggest, the relationship between events and clinical emotions was present when we accounted for (i.e., centered around) participants’ average level of state anxiety and depression throughout the week. In other words, when participants reported negative workplace events, they reported concurrent increases in their state clinical anxiety and depression that tended to be above that individual’s average levels.

At the between-person level, we see a similar pattern. Averaging across all individuals and time points, experiencing a negative event increased state clinical symptomology for both

anxiety and depression. Notably, the average level of state anxiety across all participants was 42.36, which is above the cutoff for symptoms measured by the STAI to be considered clinical (Spielberger, 1970). Approximately 38% of all observations captured symptoms of state anxiety at a “very high/severe” level (Julian, 2011; Kvaal, Ulstein, Nordhus, & Engedal, 2005). In contrast, the average level of state depressive symptomology was lower, with the average score in the normal range (Lovibond & Lovibond, 1995). However, at one standard deviation above the mean, participants exhibited average depressive symptoms that were outside the normal range and would be classified as moderate symptoms of depression under Lovibond & Lovibond’s (1995) cutoffs.

**Table 1**

*Study 1A Means, Standard Deviations and Correlations*

Variable Name	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. State Anxiety	42.36	12.28	(0.79)	0.29	0.12	0.00	0.00	-0.05
2. State Depression	5.67	8.00	0.50	(0.91)	0.23	0.00	0.00	0.05
3. Common Hassles	1.69	0.57	0.31	0.46	(0.94)	0.00	0.00	0.10
4. Trait anxiety	10.45	10.61	0.33	0.28	0.25	(0.94)	0.75	-0.01
5. Trait depression	10.68	7.93	0.40	0.44	0.27	0.75	(0.89)	-0.01
6. Cosine Day of Week	-0.24	0.58	-0.05	0.01	0.04	-0.01	-0.01	~

Note. *N* = 1,791 ESM observations across 129 participants. Within-person centered correlations are above the diagonal and between-person correlations are below the diagonal. Reliabilities are reported along the diagonal.

## Tests of Hypotheses

Our data is made of observations nested within days and within individuals. Therefore, we used multilevel mixed effects procedures with an autoregressive error term in Stata 16 (StataCorp, 2018). We first estimated an empty (null) model for each variable to illustrate that all study constructs exhibited sufficient within-person variance sufficient to test our predictions.

This proved not to be a problem. The within-person variances were as follows: state clinical anxiety = 51.2%, state clinical depression = 38.5%. To minimize model complexity (Beal, 2015), we modeled all control variables with fixed slopes and all focal relationships with random slopes (e.g., Koopman, Lanaj, & Scott, 2016; Wang, Liu, Liao, Gong, Kammeyer-Mueller, & Shi, 2013).

We within-person centered our Level-1 predictors following Enders and Tofighi (2007). Within-person centering removes variance attributable to between-person, individual-difference factors (e.g., response tendencies, traits), allowing for undiluted estimates of within-person relationships (Scott & Barnes, 2011). We also followed best practice recommendations of Enders and Tofighi (2007) and grand-mean centered trait anxiety and trait depression at Level-2 to test cross-level interactions. Residuals were constrained to an autoregressive structure and we handled missing data for endogenous variables using listwise deletion. Mixed effects results are in Table 2.

### ***Anxiety***

Hypothesis 1 predicted a positive effect of typical negative workplace events on state clinical anxiety. The results indicated typical negative events positively influenced state clinical anxiety ( $\gamma = 3.47, p < .01$ ). Hypothesis 2 predicted that individuals' trait anxiety would moderate the relationship between events and state anxiety. In support of this prediction, there was a significant interaction between typical negative events and trait anxiety ( $\gamma = 0.16, p < .01$ ). Plots of the interaction are provided in Figure 1. Simple slope analysis indicates a positive and significant slope for common events in participants higher in trait anxiety ( $\gamma = 5.22, p < .01$ ). In contrast, the simple slope was non-significant for participants lower in trait anxiety ( $\gamma = 1.7, ns$ ). Negative events, trait anxiety, and their interaction, explained 7.7% of the within-individual

variance in state anxiety. Hypothesis 3 predicted that the effects of anxiety would carry over across time periods. The autoregressive parameter was significant and positive ( $\rho = 0.18, p < .01$ ), indicating that anxiety demonstrates significant carryover affects across time periods.

### ***Depression***

For depression, Hypothesis 8 predicted a positive effect of typical negative workplace events on state clinical depression. The analysis found that events positively influenced state clinical depression ( $\gamma = 2.75, p < .01$ ). Hypothesis 9 predicted that individuals' trait depression would moderate the relationship between events and state depression. As anticipated, there was a significant interaction between workplace events and trait depression ( $\gamma = 0.16, p < .01$ ). Plots of this interaction are provided in Figure 2. Like anxiety, when predicting state depression, the simple slope for typical negative events for individuals with high trait depression was positive and significant ( $\gamma = 4.00, p < .01$ ), while the simple slope for individuals with low trait depression was non-significant ( $\gamma = 1.51, ns$ ). Negative events, trait depression, and their interaction, explained 15.4% of the within-individual variance in state depression. Hypothesis 10 predicted that the effects of depression would carry over across time periods. Results showed that the autoregressive parameter was significant and positive ( $\rho = 0.20, p < .01$ ).

**Table 2***Study 1A Results of Hypothesis Testing*

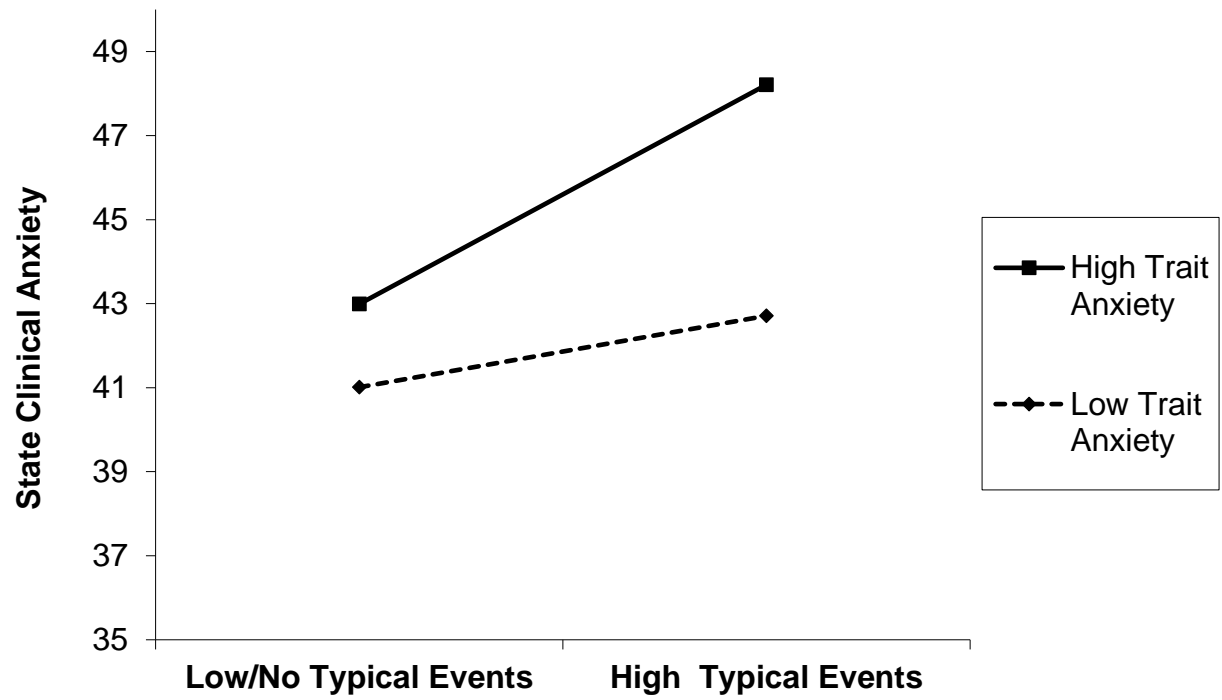
<b>Predictor</b>	<b>State Anxiety</b>		<b>State Depression</b>	
	$\gamma$	$SE$	$\gamma$	$SE$
Intercept	42.00	0.56	5.75	0.46
Trait Anxiety	0.09	0.08	0.00	0.06
Trait Depression	0.52**	0.12	0.45**	0.09
Typical Events	3.47**	1.21	2.75**	0.64
Typical Events X Trait Anxiety	0.16**	0.06		
Typical Events X Trait Depression			0.16**	0.07
Cosine Day of Week	Yes		Yes	
Autoregressive (1) Error structure	Yes		Yes	
Participant Random Intercept (Var)	47.54	6.79	26.46	3.54
Autoregressive parameter (rho)	0.18**	0.03	0.20**	0.03

Note. N = 1,791 ESM observations. Level-1 Independent variables are within-person centered and Level-2 variables are grand mean centered. Random slopes were estimated for focal relationships.

\*\* =  $p < .01$  \* =  $p < .05$  † =  $p < .1$ .

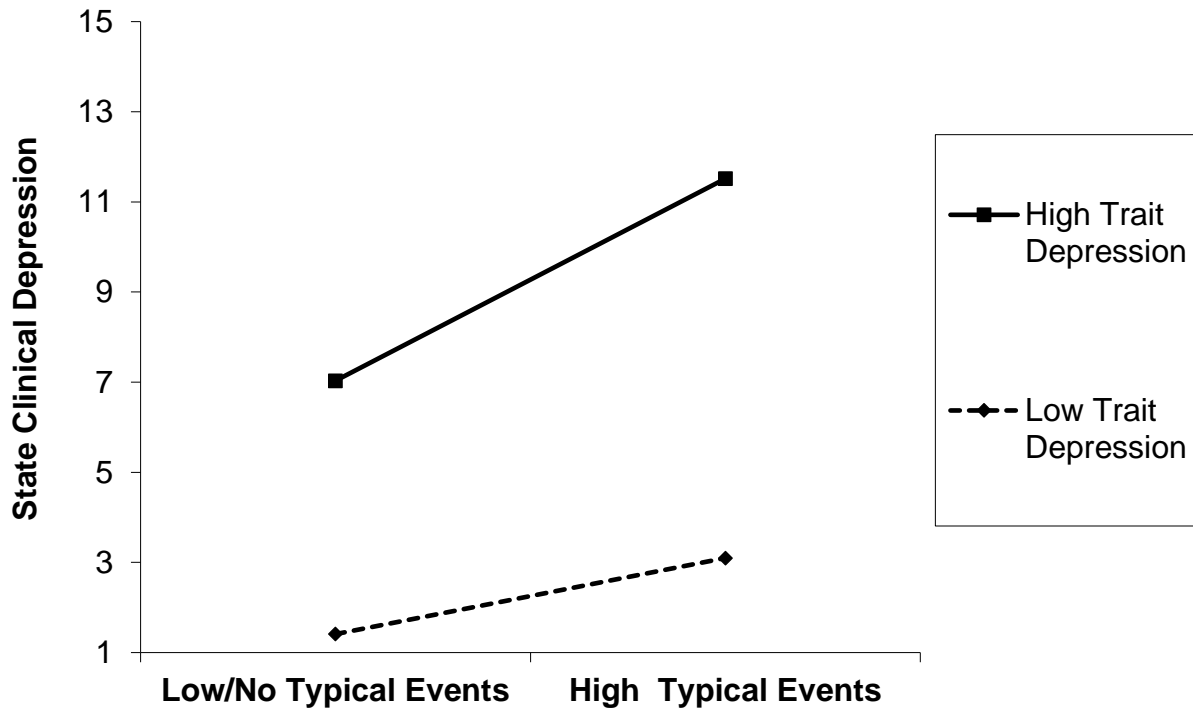
**Figure 2**

*Interaction Between Trait Anxiety and Typical Events on State Anxiety*



**Figure 3**

*Interaction Between Trait Depression and Typical Events on State Depression*



## Discussion

The results of Study 1A demonstrate the validity of the AET conceptual framework for the study of clinical symptomology throughout the workday. Our findings showed that common negative events increase participants' experiences of state anxiety and state depression. Furthermore, individual differences in participants' trait anxiety and trait depression moderated the effects of common negative work events on state clinical symptoms. In other words, individuals who are prone to experience clinical symptomology do in fact experience an increase in their anxious and depressive states after the occurrence of negative workplace events. Critically, our results showed that for anxiety the clinical states subsequent to a negative event



can reach severe levels—those above the generally accepted cutoff to be considered clinical. Practically, these are important findings which warrants further investigation. Not only have such severe levels of state anxiety been shown to interfere with normal functioning in day-to-day life, but clinical psychologists would also suggest that such clinical states warrant treatment by a trained professional (Julian, 2011; Kvaal, Ulstein, Nordhus, & Engedal, 2005). In contrast, the parallel increase in depression concurrent to a negative work event did not often result in severe depressive states. However, they also resulted in clinical affective states, which were outside the normal range of depressive symptomology.

In summary, this initial investigation accomplishes two important objectives. First, it demonstrates the utility of AET for predicting variance in clinical emotion states using an ESM based process framework. Second, this initial study demonstrated that state symptoms of anxiety and depression, which exist outside of the normal range, do occur throughout the workday. Using validated cutoffs to determine the severity of symptoms, we see severe symptoms of anxiety reported by our participants approximately 38% of the time, while moderate depression symptoms were reported approximately 13% of the time. To replicate these results and improve our inferences from this study, we conducted a second study using a sample of college undergraduates. It also employed a time separated design, in which negative work events were measured throughout the day and outcome measures were measured in the evenings.

### **Study 1B Method**

Study 1B replicates Study 1A and provides three extensions. First, we included work goal progress and self-efficacy to provide a fuller test of affective events theory. Progress on work goals can mediate between personal motivation and practical results (cf., Gaudreau, Carraro, & Miranda, 2012). As such, work goal progress is an important antecedent of employee

performance (Gabriel, Volpone, MacGowan, Butts, & Moran, 2020), learning new information (Schunk, 1990), and working autonomously (Koestner, Otin, Powers, Pelletier, & Gagnon, 2008). Self-efficacy is likewise a key driver of employee performance (Stajkovic & Luthans, 1998; Chen, Casper, Cortina, 2001; Bandura, 1994). Second, we separated the measurement of our mediating and dependent variables from our independent variables, capturing negative work events during the day and outcome measures in the evening. Third, we measured atypical work events instead of common hassles. Employing multiple designs, time points, and operationalizations of focal variables is important for generalizability and reduces the concerns of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

### **Sample and Procedure**

We recruited participants for our second experience sampling methodology (ESM) study from the same university student subject pool as in Study 1A approximately 12 months after the previous study. The procedures for Study 1B were the same as for Study 1A with two exceptions. First, the morning survey time was changed to 10:00 a.m. This change was made in response to participant feedback in the previous study. Second, to reduce participant fatigue, Study 1B implements a diary study design whereby outcome measures are only collected in the evenings while negative events are measured during the day. Methodologically, this provides for a more a conservative test of our theoretical predictions at the cost of capturing variance in clinical affective states within each workday. In total, 152 participants opted in and completed at least one daily survey. Participants were emailed three surveys a day. On average, the morning survey was completed at 11:14 a.m., the afternoon survey was completed at 12:59 p.m. the evening survey was completed by 7:11 p.m. We retained surveys from participants who completed at least three full days of sequential surveys (i.e., morning, afternoon, and evening

surveys). We used the same decision rules as in the previous study to omit data collected out of order or after the performance episode had passed. This resulted in a final sample 1,805 ESM observations across 147 participants, with 592 evening surveys capturing outcome measures. On average participants completed 12.3 surveys. The average age of participants was 19.35 ( $SD = 0.99$ ) and 42.35% of participants identified as female. The majority of participants (78.02%) were Caucasian, (1.3%) identified as African American, (10.39%) identified as Asian, (9.74%) identified as Hispanic/Latino.

A total of 72.82 % of our participants exhibited normal/minimal trait depressive symptoms at, 18.53% exhibited mild symptoms, 6.61% exhibited moderate symptoms, while 1.98% exhibited severe levels of depressive symptomatology. For anxiety, the pattern was similar, although higher. Approximately 39.07 % of participants exhibited normal/minimal trait anxious symptoms, 27.15% reported mild symptoms, 17.21% reported moderate symptoms, while 16.5% reported severe symptoms. When it came to capturing state symptoms of anxiety and depression, for state anxiety, approximately 37.38 % of all ESM observations were in the normal range, 18.59% were moderate, and 36.01 % were very high or severe. For state depression, the pattern was similar albeit lower. Approximately 77.44 % of all ESM observations were in the normal range, 7.13 % were mild, 8.4% were moderate, and 4.39% were severe.

### ***Measures***

**Atypical Work Events.** Events which exceed the criteria to be considered common hassles were measured in two steps adapted from the Rochester Interaction Record, a method developed for ESM studies to capture stressful events that occur at work (RIR; Reis & Wheeler, 1991; DIRO; Peters, Buunk & Schaufeli, 1995). First, participants indicated whether they had experienced a significant event which left them upset since the last time they had completed a

survey. If a participant responded “yes”, they were then asked to describe the event and complete six items which captured how critical the event was, how uncommon and unexpected the event was, and how disruptive the event was. Analyses were conducted using a dichotomous variable, where 1 indicates that an atypical negative event took place and 0 indicated no event took place. Skarlicki, van Jaarsveld, and Walker (2008) demonstrated that for negative events, most of the variance in work events is captured using a dichotomous variable.

**Anxiety and Trait depression and State Symptoms.** Trait anxiety and state anxiety were measured using the same scales administered in Study 1A (trait anxiety  $\alpha = 0.94$ ; state anxiety  $\alpha = 0.82$ ). Trait depression and state Depression were measured using the same scales administered in Study 1A (trait depression  $\alpha = 0.86$ ; state depression  $\alpha = 0.91$ ).

**Work Goal Progress.** Each evening participants indicated the extent to which they made progress on their work goals that day through their agreement to three items adapted from Wanberg, Zuh, and Van Hooft (2010). The items are “Today, I made good progress on my work goals,” “Today, I have been productive,” and “I have moved forward on my goals today” ( $\alpha = 0.89$ ). Items range on a Likert scale from 1 (Strongly disagree) to 5 (strongly agree).

**State Self-efficacy.** Self-efficacy was measured using the eight-item New Generalized Self-Efficacy Scale (Chen, Gully, & Eden, 2001). Participants were instructed to report their agreement to items “right now, in this moment.” Sample items include “I am confident I can perform effectively on many different tasks” and “Even when things are tough, I can perform quite well.” The items range on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) ( $\alpha = 0.95$ ).

**Controls.** The same controls as were used in study 1A were used in Study 1B.

## Study 1B Results and Discussion

### Descriptive Statistics and Correlations

The means, standard deviations, reliabilities (averaged across days), and correlations for sample 1B are reported in Table 3. Participants reported an atypical negative work event in approximately 11% of recorded ESM observations. Such events were significantly and positively correlated to state anxiety and depression. Like Study 1A, the average state anxiety score was approximately 43, indicating a clinically significant level of anxiety in our participants on any given evening. Additionally, we find negative correlations between state clinical symptoms for both anxiety and depression and the outcomes work goal progress and self-efficacy. These range between -0.32 and -0.47, providing initial support for our predicted relationships.

**Table 3**

*Study 1B Means, Standard Deviations and Correlations*

	Variable Name	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1	Atypical Event	0.11	0.30	~						
2	State Depression	5.18	7.84	0.11	(0.91)					
3	State Anxiety	42.94	12.97	0.16	0.54	(0.82)				
4	Work Goal Progress	3.89	0.88	-0.07	-0.32	-0.36	(0.89)			
5	Self-Efficacy	3.94	0.79	-0.02	-0.38	-0.47	0.57	(0.94)		
6	Trait Depression	10.71	6.96	0.03	0.49	0.45	-0.36	-0.47	(0.86)	
7	Trait Anxiety	14.42	12.74	0.07	0.31	0.33	-0.25	-0.30	0.68	(0.94)

Note. N = 1,805 ESM observations across 147 participants. Number of evening surveys = 592. Chronbach's alpha (averaged across days) are reported along the diagonal.

### Tests of Hypotheses

The analysis in this study is the same as in Study 1A. We included the lagged value of state clinical emotions to account for autoregressive effects instead of imposing an autoregressive error structure as in the previous study (e.g., Beal, 2003; Hill et al., 2020). Mixed effects analysis results are in Table 4. We first estimated an empty (null) model for each variable

to illustrate that all study constructs exhibited within-person variance sufficient to test our predictions. The within-person variances were as follows: state anxiety = 36.2%, state depression = 37.9%, work goal progress = 38.8%, self-efficacy = 35.7%. Mixed effects results are presented in Table 4.

### ***Anxiety***

Results supported Hypotheses 1 and 2. For anxiety, negative atypical events positively related to state anxiety ( $\gamma = 5.20, p < .1$ ). Inspection of the model revealed a significant interaction between negative events and trait anxiety ( $\gamma = 0.30, p < .05$ ). Figure 3 plots the interaction between atypical events and trait anxiety on state clinical anxiety. Simple slope analysis revealed that the only significant slope for negative events on state anxiety symptoms was found for individuals prone to experience such clinical states ( $\gamma = 9.09, p < .01$ ). For individuals not prone to anxiety, the simple slope was not significant ( $\gamma = 1.29, ns$ ). Hypothesis 3 predicted that the effects of anxiety would carry over across time periods. Unexpectedly, results capturing the effect of the lagged value of state anxiety showed that anxiety the previous evening was not a significant predictor of state anxiety the following evening ( $\gamma = -0.08, ns$ ). Hypothesis 5 predicted a negative relationship between state anxiety when predicting work goal progress and state self-efficacy in the evenings. When modeling work goal progress, findings supported these predictions. State clinical anxiety negatively related to work goal progress ( $\gamma = -0.01, p < .01$ ). Likewise, for self-efficacy, results indicate a significant negative coefficient of anxiety on self-efficacy in the evening (anxiety:  $\gamma = -0.013, p < .05$ ). State anxiety explained 4.5% of the within-individual variance in work goal progress and 4.1% of the within-person variance in self efficacy.

Hypothesis 6 predicted that state anxiety mediates the relationship between negative work events and work goal progress and self-efficacy. To test this hypothesis, the indirect effects of atypical events were examined. In testing multilevel moderated mediation, we followed Preacher, Zyphur, and Zhang (2010) and Selig and Preacher (2008) and used a parametric bootstrapping approach with 1,000 simulated parameter estimates to create 95% bias-corrected confidence intervals around the indirect effect estimates and the indices of moderated mediation (Wallace, Butts, Johnson, Stevens, & Smith, 2016). We first examined 1-1-1 mediation (Preacher et al., 2010) by testing the indirect effect atypical events had on each outcome via state clinical anxiety. We then calculated our conditional indirect effects at high and low levels of trait anxiety at Level-2.

Results indicate that the indirect effect from atypical events to work goal progress via anxiety was significant and negative (estimate = -0.037; 95% BCCI = -0.081, -0.006), as was the indirect effect of events on self-efficacy (estimate = -0.053; 95% BCCI = -0.092, -0.016), supporting Hypothesis 6. Hypothesis 7 predicted that trait anxiety would moderate the indirect effect of atypical work events. Bootstrapped confidence intervals for the index of moderated mediation did not cross zero for both work goal progress (index = -0.003; 95% BCCI = -0.006 - 0.0003) and self-efficacy (estimate = -0.004; 95% BCCI = -0.007 -0.0002), supporting Hypothesis 7.

### ***Depression***

For depression, results did not support Hypothesis 8, Hypothesis 9, or Hypotheses 11-13. The interaction between negative events and trait depression was not significant ( $\gamma = -0.10$ , *ns*) nor was the effect of negative events when predicting state depression ( $\gamma = 2.18$ , *ns*). Trait depression remained a significant predictor of state depression ( $\gamma = 0.18$ ,  $p < .01$ ). Hypothesis 10

predicted that there would be a significant carryover effect of state depression across time periods. Results showed that there was a significant effect of the depression the previous evening on current state depression ( $\gamma = 0.75, p < .01$ ), providing support for Hypothesis 10. Finally, state depression was not a significant predictor of work goal progress nor self-efficacy ( $\gamma = -0.01, ns$ ;  $\gamma = -0.01, ns$ ). Indirect effects were not calculated for depression.



**Table 4***Study 1B Results of Hypothesis Testing*

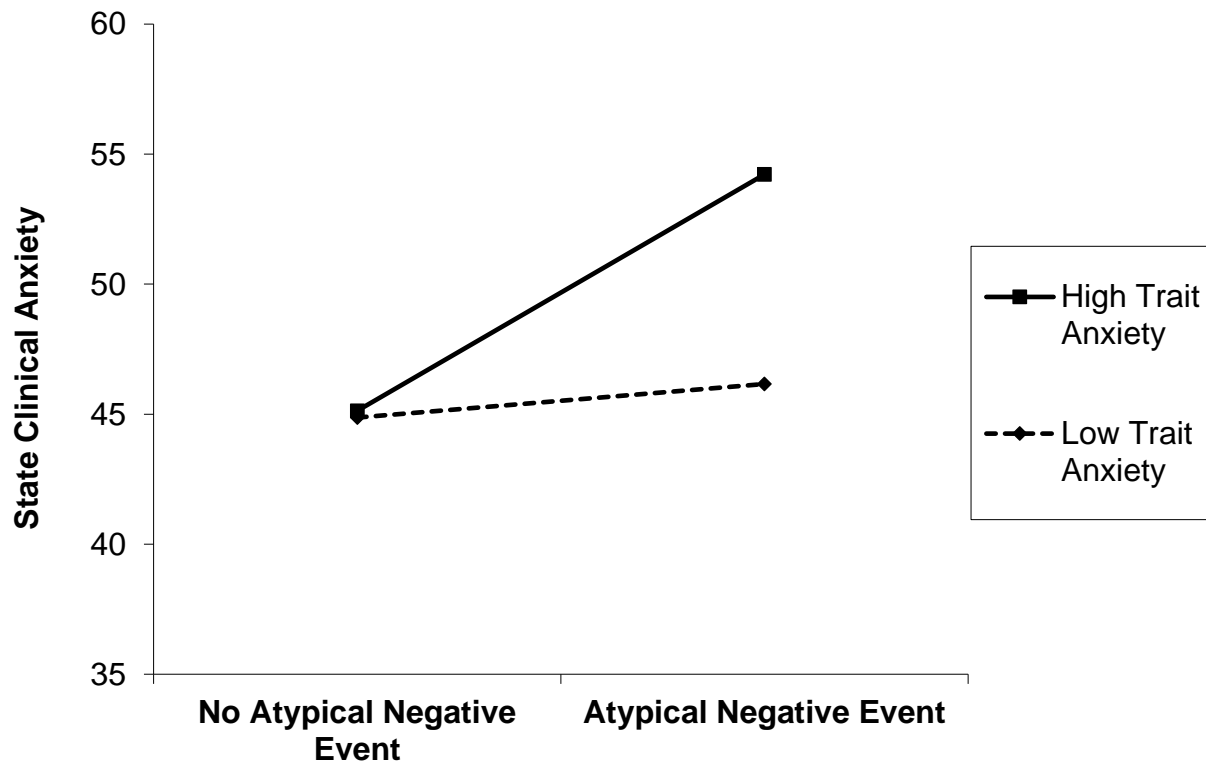
Predictor	State Anxiety		State Depression		Work Goal Progress		Self-Efficacy	
	$\gamma$	<i>SE</i>	$\gamma$	<i>SE</i>	$\gamma$	<i>SE</i>	$\gamma$	<i>SE</i>
Intercept	45.54	1.59	0.94	0.22	3.98	0.23	3.34	.46
Trait anxiety	0.01	0.09	-0.02	0.02	-0.00	0.01	0.01	0.01
Trait depression	0.83**	0.17	0.18**	0.04	-0.04**	0.01	-0.05**	0.01
Atypical Negative Event	5.20 <sup>†</sup>	2.71	2.18	1.34	0.04	0.18	0.04	0.12
State Anxiety					-0.01**	0.00	-0.01**	0.00
State Depression					-0.01	0.01	-0.01	0.01
Atypical Negative Events X Trait anxiety	0.30**	0.15						
Atypical Negative Events X Trait depression			-0.10	0.17				
Cosine Day of Week	Yes		Yes		Yes		Yes	
Lagged Dependent Variable	-0.08 <sup>†</sup>	0.04	0.75**	0.02	0.05	0.05	0.10**	0.04
Participant Random Intercept (Var)	89.27	15.39	0.71	0.63	0.29	0.09	0.13	0.04

*Note.* N = 592 evening observations. Level-1 Independent variables are within-person centered and Level-2 variables are grand mean centered. Random slopes were estimated for focal relationships.

\*\* =  $p < .01$  \* =  $p < .05$  <sup>†</sup> =  $p < .1$ .

**Figure 4**

*Interaction Between Trait Anxiety and Atypical Events on State Anxiety*



## Discussion

In this study we find partial support for our hypotheses in a diary study with time-separated variables. Consistent with the prior study, our results showed that negative events during the day were positively related to state anxiety in the evenings, but not state depression in the evenings. Likewise, state anxiety, but not state depression in the evenings, was negatively related to work goal progress throughout the day and state self-efficacy. While in some ways the diary design strengthens the inferences that may be made regarding the relationship between events and state anxiety and depression, it also limits the number of instances in which our state

emotions are captured during the work week and results in lower power than is seen in other ESM designs. In Study 2, we take this into consideration and return to a design in which we measure all of our variable during each ESM survey.

Two points regarding the findings of Study 1 are worth mentioning here. First, our data have a lot to teach us about the experiences of college undergraduates. Across both samples, we find that approximately 63.33% of participants exhibit symptoms of anxiety and 24.65% percent of students exhibit depression outside the normal range, with 37% of those symptoms above the cutoff to be considered severe for anxiety, and 5.05% above the cutoff to be considered severe for depression. This finding is consistent with national averages (ADAA, 2018). College students are under severe pressure which can affect their well-being. In a 2013 survey of college undergraduates, 41.7% reported that anxiety was a top concern. In a similar survey two years later, 85% reported that they had been overwhelmed by everything they had to do at some point during the previous year (NCHA, 2015). Many college undergraduates are employees, and the epidemic of mental illnesses among young employees has become a key concern for practitioners (Wilkie, 2020). Second, across two ESM studies we tested our methodology and find strong support for the use of pretests and ESM in capturing depression and anxiety.

There are two additional limitations worthy of note in Study 1. First, data for both samples were collected over the period of a single week. It may be the case that more data was necessary in order to find the interaction between trait depression and atypical events, especially given its lower base rates and state levels. While our data suggest that we are sampling experiences with variability in our measured constructs, data collected over a longer time-period would result in a more realistic sample of experiences (Gabriel et al., 2019; Beal, 2015). Second, while many college undergraduates are employees as well as students, a sample of employed

participants would result in more generalizable results. In Study 2, we collect data of currently employed individuals over a two-week time-period while assessing state job satisfaction as an additional outcome measure.

## **Study 2 Method**

### **Sample and Procedure**

We recruited participants for this ESM study from Amazon's Mechanical Turk platform. To participate, individuals had to be employed full-time and living in the United States. Prospective participants were told that the study would take place over ten workdays (i.e., Monday through Friday for two work weeks), and that they would be asked to complete three surveys a day in addition to a pretest one week before ESM data collection began. Participants were paid \$1 for the pretest and \$0.50 per completed daily survey, with a bonus of \$5 for completing all surveys across the 10 days. As bot responses are a common concern in convenience samples (Moss & Litman, 2018; Chmielewski & Kucker, 2020), extra work was taken to remove bots from the initial pool of interested participants. This was done in a three-step procedure.

First, a reCAPTCHA was included at the beginning of the pretest. Second, three different attention checks at separate locations in the pretest were included. These required selecting a specified answer from a list of answers to a question, providing identical written text response to two sequential short answer questions, and providing written answers to simple arithmetic questions (e.g., please provide an answer to the following question "What is the sum of five plus six? Please write the answer in letters using all caps.") Participants who failed any of the attention checks were not included in the daily surveys. Next, to ensure bots that are present on the MTurk platform were not included in our daily surveys, participants completed ESM surveys

outside of the MTurk environment, through email distributions created in Qualtrics using email addresses that were provided in the pretest. Finally, there are geographic coordinates that have been known to host bot farms. Such locations and MturkIds were excluded using the CloudResearch (formerly TurkPrime) platform's "exclude suspicious locations" option (Moss & Littman, 2018). In addition to this measure, post hoc analysis of IP addresses and latitude and longitude coordinates was run on the data to ensure that the locations matched and were not duplicated in the data. There were 9 cases where survey responses were collected from a duplicated set of longitude and latitude coordinates, a common signal of bot farming (Chmielewski & Kucker, 2020). In each case, data were collected from a unique IP address and manual inspection of the data showed adequate variability in the data and logical answers to attention checks and written responses in both the pretest and subsequent ESM observations. Further, no single set of coordinates accounted for more than 2.5% of the total observations. In total 336 participants took the pretest. A total of 42 respondents failed at least one of the attention checks. A total of eight participants were not interested in further participation beyond the pretest. After accounting for data quality described above, this resulted in a final sample of 285 participants who completed the pretest and were ultimately invited to participate in daily surveys, for a retention rate of 87%.

Participants were emailed three experience sampling surveys a day using Qualtrics email distributions. The morning survey was distributed at 10:00 a.m. Participants were asked to complete this survey before they were sent the second survey of the day or to skip the survey if they were unable to do so; on average, the morning survey was completed at 11:15 a.m. The afternoon survey was distributed at 12:00 p.m. Similar to the morning survey, we asked participants to complete this survey prior to the final survey of the day or to skip it entirely. On

average, the afternoon survey was completed by 2:42 p.m. Finally, the evening survey was distributed at 6:30 p.m.; on average, the evening survey was completed by 7:20 p.m. On the sixth morning of surveys (the second Monday), Qualtrics email distribution system failed. This resulted in the morning survey for the day being sent approximately 45 minutes later than scheduled. All participants were paid for the survey regardless of whether they were able to complete it. We retained surveys from participants who completed at least three full days of sequential surveys (i.e., morning, afternoon, and evening surveys) and omitted data that were collected out of order (i.e., a participant completed the morning survey after the afternoon survey for that day). This resulted in a final sample 5,275 observations across 243 participants.

For anxiety, the pattern was similar. Approximately 61.32% of participants exhibited normal/minimal trait anxious symptomology, 17.71% reported mild symptoms, 11.51% reported moderate symptoms, while 9.44% reported severe symptoms. A total of 62.96% of our participants exhibited normal/minimal trait depressive symptoms, 18.81% exhibited mild symptoms, 10.69% exhibited moderate symptoms, while 8.2% exhibited severe levels of depressive symptomatology. When it came to capturing state symptoms, for state anxiety, approximately 62.07% of all ESM observations were in the normal range, 14.85% were moderate, and 19.10% were very high or severe. For state depression, approximately 86.30% of all ESM observations were in the normal range, 3.42% were mild, 4.26 % were moderate, and 6.03% were severe.

### ***Measures***

Unless otherwise mentioned, all scales are the same as those administered in Study 1. Atypical events were measured using the same procedure as in Study 1B. Examples of events reported by participants include annual performance reviews, being called out in a group meeting for not submitting a project on time, learning that team members were being laid off, having a

supervisor unexpectedly quit, learning that a coworker passed away, and having a heated disagreement with a boss. The reliabilities are as follows. The trait anxiety and state anxiety alpha reliabilities were 0.94 and 0.91, respectively. The alpha reliabilities for trait depression and state depression were 0.95 and 0.91. For work goal progress, the items were changed to refer to goal progress made since the previous survey signal ( $\alpha = 0.96$ ). The self-efficacy alpha reliability was 0.97.

**State Job Satisfaction.** Job satisfaction was measured using the three-item scale developed by Seashore and colleagues to capture the affective component of job satisfaction (Seashore, Lawler, Mirvis, & Camman, 1982). Participants were instructed to report their agreement to items “right now, in this moment.” Sample items include “Right now, I am satisfied with my job” and “Right now, I like working here.” The items range on a Likert scale from 1 (strongly disagree) to 7 (strongly agree) ( $\alpha = 0.93$ ).

**Controls.** Given the large sample size and two-week length of the study, we controlled for both the autoregressive parameter,  $\rho$ , as well as the lagged value of the dependent variable being measured. Using both measures in combination in a multilevel framework provides for more rigorous hypothesis testing (Beal, 2015) in intensive longitudinal data. As with previous studies, we also control for the cosine of the day of the week to adjust for generalized cyclical patterns known to occur over the course of the work week. Similarly, all focal Level-1 slopes were modeled as random with the control variables being modeled as fixed. All findings reported are robust to the exclusion of such controls. We report only the results with control measures in place which represents the most robust tests of our hypotheses.

## **Study 2 Results and Discussion**

### **Descriptive Statistics and Correlations**

The means, standard deviations, reliabilities (averaged across days), and correlations for Study 2 are reported in Table 5. In this sample, participants reported an atypical event in approximately 10% of the recorded ESM observations. Such events were significantly and positively correlated to state anxiety and depression. In contrast to previous studies, the average state anxiety score was (35.97). However, this level does not meet the cutoff to be designated as clinical (Spielberger, Gorsuch, & Lushene, 1970; Julian, 2011; Kvaal et al., 2005). Nevertheless, a large portion of our ESM observations reported state symptoms of anxiety that were above the cutoff to be designated clinical (19.1% of all observations were above the cutoff score of 45). Further, there was a negative correlation between both the state clinical emotions anxiety and depression and the outcomes, job satisfaction, work goal progress, and self-efficacy ranging between -0.37 and -0.66.



**Table 5***Study 2 Means, Standard Deviations, and Correlations*

<b>Variable Name</b>	<b>M</b>	<b>SD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1. State Clinical Anxiety	35.97	15.16	(0.91)								
2. State Clinical Depression	3.80	8.33	0.59	(0.91)							
3. Atypical Negative Event	0.12	.33	0.37	0.12	~						
4. Trait Anxiety	8.38	9.96	0.41	0.45	0.06	(0.94)					
5. Trait Depression	11.14	11.01	0.50	0.63	0.05	0.71	(0.95)				
6. Work Goal Progress	3.87	1.05	-0.50	-0.51	-0.09	-0.34	-0.41	(0.96)			
7. Job Satisfaction	4.38	0.74	-0.39	-0.37	-0.07	-0.16	-0.24	0.44	(0.93)		
8. Self-Efficacy	4.03	0.98	-0.60	-0.66	-0.08	-0.39	-0.53	0.71	0.50	(0.97)	
9. Cosine Day of the Week	-0.25	0.58	-0.01	0.02	0.00	0.00	0.00	0.01	0.00	0.00	~

*Note.* N = 5,275 ESM observations across 243 individuals. Chronbach's alpha are reported along the diagonal.

## Tests of Hypotheses

The analysis of data from Study 2 was the same as in previous studies with the addition of tests of moderated mediation. In testing multilevel moderated mediation, we followed Preacher, Zyphur, and Zhang (2010), and Selig and Preacher (2008). They used a parametric bootstrapping approach using Multilevel Path Analysis in SEM with 1,000 simulated parameter estimates to create 95% bias-corrected confidence intervals around the indirect effect estimates and the indices of moderated mediation (Wallace, Butts, Johnson, Stevens, & Smith, 2016). We first examined 1-1-1 mediation (Preacher et al., 2010) by testing the indirect effect common events and hassles on each outcome via state anxiety and depression. We then calculated the indices of moderated mediation and our conditional indirect effects at high and low levels of trait anxiety and depression at Level-2 via atypical negative events at Level-1 (1 SD above and below the mean). Interactions at Level-1 were within-person centered. The same control variables as were utilized in previous studies were included in the MSEM analyses.

Mixed effects analysis results are in Table 6. Analysis of conditional indirect effects are reported in Tables 7 and 8. We first estimated an empty (null) model for each variable to illustrate that all study constructs exhibited within-person variance sufficient to test our predictions. The within person variances were as follows: state anxiety = 46.5%, state depression = 21.2%, state job satisfaction = 41.1%, work goal progress = 47.9%, state self-efficacy = 31.6%. Consistent with AET and with our initial study, there was considerable variance within individuals.

**Table 6***Study 2 Results of Hypothesis Testing*

Predictor	State Anxiety		State Depression		Job Satisfaction		Work Goal Progress		Self-Efficacy	
	$\gamma$	SE	$\gamma$	SE	$\gamma$	SE	$\gamma$	SE	$\gamma$	SE
Intercept	26.28	0.62	1.48	0.19	2.72	0.11	1.81	0.10	3.96	0.83
Trait Specific Curiosity	0.13**	0.06	0.003	0.03	0.003	0.003	0.02	0.01	0.002	0.01
Trait Diverse Curiosity	0.41**	0.12	0.23**	0.02	-0.001	0.003	0.05	0.01	-0.01**	0.003
State Interest					-0.01**	0.002	-0.02**	0.01	-0.02**	0.001
State Deprivation					-0.01**	0.001	-0.04**	0.002	-0.03**	0.002
Lagged State Interest	0.21**	0.01								
Lagged State Deprivation			0.49**	0.01						
Lagged Job Satisfaction					0.29**	0.01				
Lagged Task Engagement							0.15**	0.01		
Day of Week Cosine Effects	Yes		Yes		Yes		Yes		Yes	
Autoregressive (1) Error structure	Yes		Yes		Yes		Yes		Yes	
Participant Random Intercept (Var)	37.23	8.67	6.53	0.83	0.72	0.11	0.47	0.08	0.51	0.07
Autoregressive parameter (rho)	0.16	0.06	-0.21	0.02	-0.21	0.09	0.45	0.09	0.03	0.09

*Note.* N = 5,275 ESM observations across 243 individuals. Level-1 Independent variables are within-person centered and Level-2 variables are grand mean centered. Random slopes were estimated for focal relationships.

\*\* =  $p < .01$  \* =  $p < .05$  † =  $p < .1$

## *Anxiety*

Results supported Hypotheses 1 and 2, replicating the findings of Study 1. Negative atypical events positively influenced state anxiety ( $\gamma = 16.81, p < .01$ ). Further, there was a significant interaction between negative events and trait anxiety, with the highest levels of state anxiety reported for participants high in trait anxiety after an event took place. However, the interaction was relatively small and negative, contrary to previous studies ( $\gamma = -0.19, p < .01$ ). Figure 4 plots this interaction. Both simple slopes are positive and significant. However, the slope for individuals with low trait anxiety is slightly larger relative to individuals who are prone to such clinical states (low trait anxiety:  $\gamma = 17.80, p < .01$ , high trait anxiety:  $\gamma = 14.20, p < .01$ ). While this is interesting and warrants exploration, Figure 4 illustrates that these findings are generally consistent with our hypothesis. It is the combination of negative work events and high trait anxiety that results in the highest levels of clinically anxious states. In combination events, trait anxiety, and their interaction, explained 35.35% of the within-individual variance in state anxiety. Hypotheses 3 predicted that anxiety would carry over across time periods. Results indicate the lagged value of state anxiety was a significant and positive predictor of state anxiety ( $\gamma = 0.21, p < .05$ ).

Our results also provide support for Hypotheses 4 and 5, which predicted a negative relationship between state clinical anxiety and job satisfaction, work goal progress, and state self-efficacy. For job satisfaction, there was a significant negative relationship for clinical anxiety ( $\gamma = -0.01, p < .01$ ). Likewise, a similar pattern was found for work goal progress ( $\gamma = -0.02, p < .01$ ) as well as state self-efficacy ( $\gamma = -0.02, p < .01$ ). Within individuals, state anxiety accounted for 2.12% of the variance in job satisfaction, 3.41% of the variance in work goal progress, and 10.29% of the variance in self-efficacy.

Concerning indirect effects, Hypothesis 6 predicted that state anxiety mediates the relationship between negative work events, job satisfaction, work goal progress, and self-efficacy. Results support these predictions, finding that the indirect effects from atypical events to job satisfaction via anxiety were significant and negative (estimate = -0.162; 95% BCCI = -0.196 -0.133), as were the indirect effects of events on work goal progress (estimate = -0.294; 95% BCCI = -0.347, -0.218), and self-efficacy (estimate = -0.302; 95% BCCI = -0.350, -0.233). These findings support Hypothesis 6. Hypothesis 7 predicted that trait anxiety would moderate the indirect effect of atypical work events. The interaction term was significant. Bootstrapped confidence intervals for the indices of moderated mediation did not cross zero for job satisfaction (estimate = 0.002; 95% BCCI = 0.001, 0.004), work goal progress (estimate = 0.003; 95% BCCI = 0.002, 0.006), or self-efficacy (estimate = 0.004; 95% BCCI = 0.002 0.006). Table 7 reports the conditional indirect effects at high and low levels of trait anxiety.

**Table 7**

*Conditional Indirect Effects of Negative Work Events at High and Low Levels of Trait Anxiety*

Mediator	Dependent Variable	Indirect Effect	Estimate	LLCI	ULCI
Anxiety	Job Satisfaction	@ High Trait Anxiety	-0.14	-0.17	-0.12
		@ Low Trait Anxiety	-0.18	-0.21	-0.16
	Work Goal Progress	@ High Trait Anxiety	-0.26	-0.31	-0.21
		@ Low Trait Anxiety	-0.33	-0.38	-0.29
	Self-Efficacy	@ High Trait Anxiety	-0.26	-0.30	-0.23
		@ Low Trait Anxiety	-0.34	-0.38	-0.31

### ***Depression***

Results supported the predictions made in Hypotheses 8 and 9. Negative atypical events positively related to depressive states ( $\gamma = 3.05, p < .01$ ). Further, there was a significant

interaction between negative events and trait depression ( $\gamma = 0.07, p < .01$ ). Figure 5 plots this interaction. Probing the interaction finds that both simple slopes are significant (low trait depression:  $\gamma = 2.90, p < .01$ , high trait depression:  $\gamma = 4.46, p < .01$ ), with the highest depressive states seen in individuals prone to such clinical states after an atypical negative event happens at work. Furthermore, findings provide support for Hypotheses 11 and 12. For job satisfaction, there was a significant negative relationship ( $\gamma = -0.01, p < .01$ ). Likewise, a similar pattern was found for work goal progress ( $\gamma = -0.04, p < .01$ ), as well as state self-efficacy ( $\gamma = -0.03, p < .01$ ). In combination events, trait depression, and their interaction, explained 26.11% of the variance in state depression. Within individuals, state depression accounted for 6.87% of the variance in job satisfaction, 8.43% of the variance in work goal progress, and 6.10% of the variance in self-efficacy.

Hypothesis 13 predicted that state depression mediates the relationship between negative work events, job satisfaction, work goal progress and self-efficacy. Results indicate that the indirect effects from atypical events to job satisfaction via depression was significant and negative (estimate = -0.026; 95% BCCI = -0.040, -0.016). The indirect effects of events on work goal progress (estimate = -0.075; 95% BCCI = -0.117 -0.042) and self-efficacy (estimate = -0.107; 95% BCCI = -0.139 -0.075), supporting Hypothesis 13. Hypothesis 14 predicted that trait depression would moderate the indirect effect of atypical work events. Bootstrapped confidence intervals for the index of moderated mediation did not cross zero for job satisfaction (estimate = -0.002; 95% BCCI = -0.004 -0.001), work goal progress (estimate = -0.003; 95% BCCI = -0.004 -0.001) or self-efficacy (estimate = -0.003; 95% BCCI = -0.005 -0.001), supporting Hypothesis 14. Table 8 reports the conditional indirect effects of negative work events at high and low levels of trait anxiety.

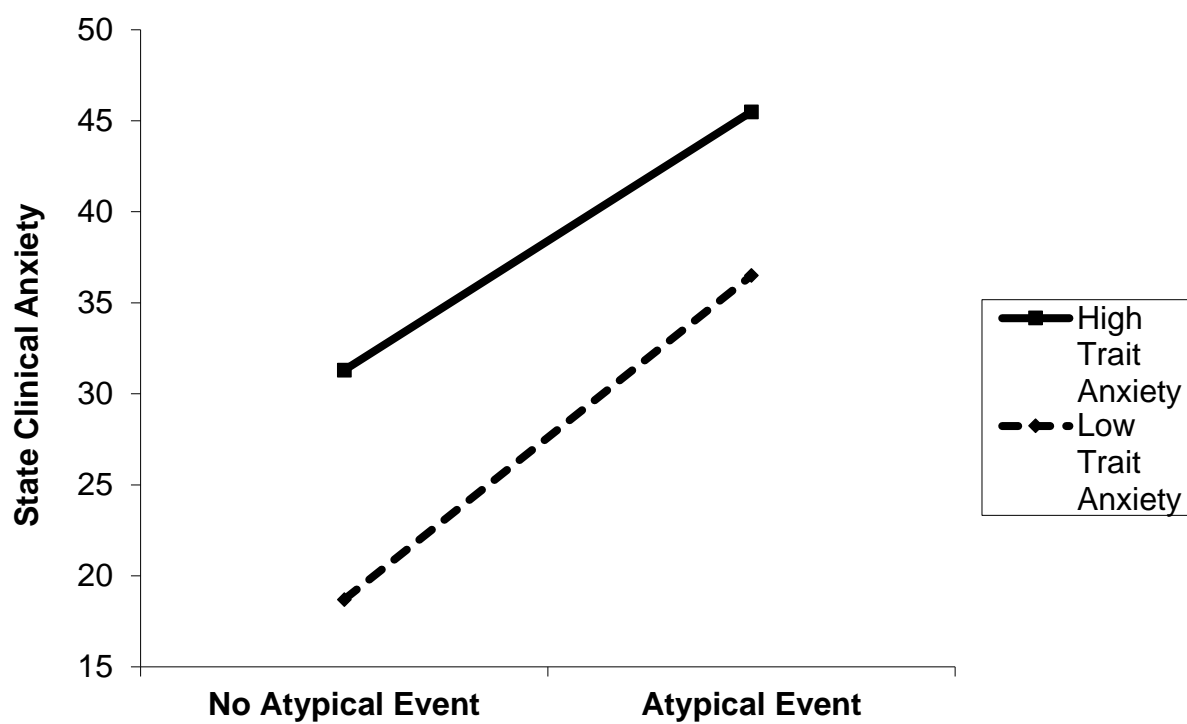
**Table 8**

*Conditional Indirect Effects of Negative Work Events at High and Low Trait Depression*

Mediator	Dependent Variable	Indirect Effect	Estimate	LLCI	ULCI
Depression	Job Satisfaction	@ High Trait Depression	-0.03	-0.05	-0.02
		@ Low Trait Depression	-0.02	-0.03	-0.01
	Work Goal Progress	@ High Trait Depression	-0.09	-0.14	-0.05
		@ Low Trait Depression	-0.06	-0.08	-0.04
	Self-Efficacy	@ High Trait Depression	-0.13	-0.17	-0.09
		@ Low Trait Depression	-0.08	-0.10	-0.06

**Figure 5**

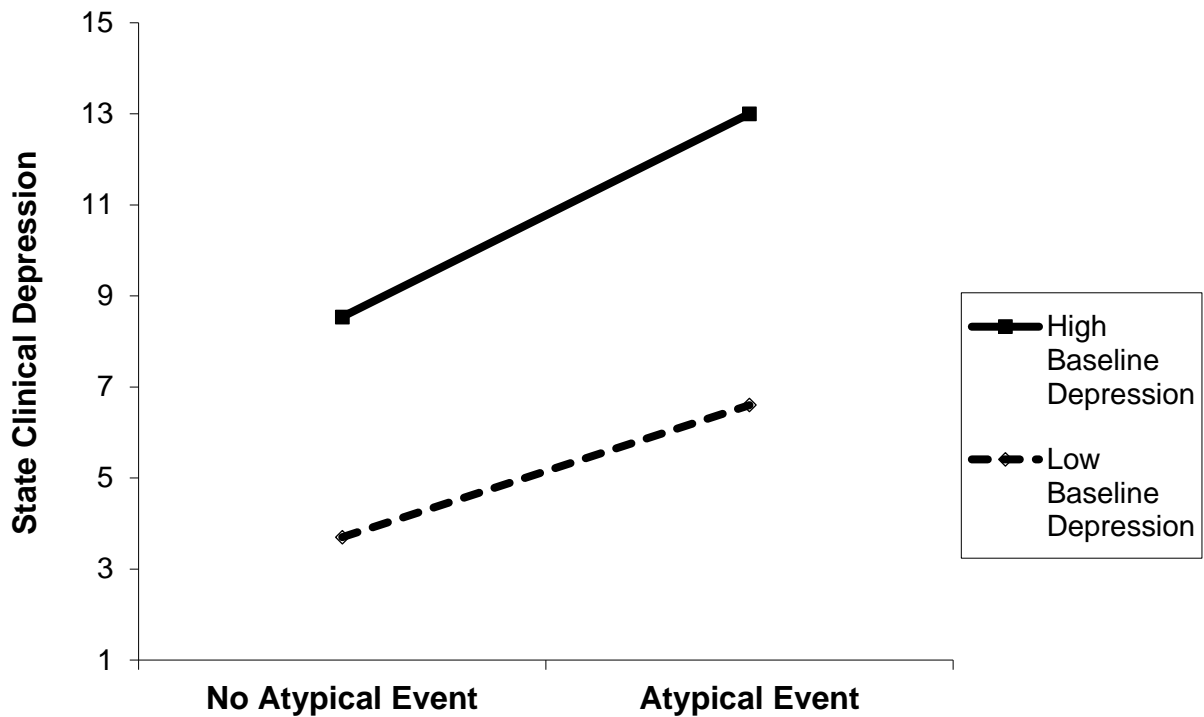
*Study 2 Interaction Between Trait Anxiety and Atypical Negative Events on State Anxiety*





**Figure 6**

*Study 2 Interaction Between Trait Depression and Atypical Negative Events on State Depression*



## Discussion

Overall, the results of Study 2 provide support for our theorizing. Our findings replicate the findings from our previous samples, illustrating that individual predispositions and negative work events result in the highest levels of state clinical anxiety and depression. Furthermore, these negative events hinder job satisfaction, work goal progress, and self-efficacy through state anxiety and depression. This effect was small and did not change the interpretation of the results. Additionally, the longer time frame and increased power of Study 2 allowed us to replicate the interaction between events and trait depression that was seen in our first student sample.

Ultimately, results showed that our findings generalize to a sample of employed adults. We again found that for both anxiety and depression, the state experiences of clinical emotions reported by

our participants can reach levels surpassing clinical cutoffs and interrupt normal day-to-day functioning. Consistent with AET predictions, each clinical state influenced our outcome variables while controlling for the other, suggesting that they show unique effects on job satisfaction, goal progress, and self-efficacy. Ultimately, Study 2 replicated and extended the findings from Study 1 to a sample of currently employed participants over a two-week period.

### **General Discussion**

Emotions are a fundamental part of work life. Despite the centrality of emotion to the study of work experiences, research is still needed to explain some of the most severe and costly emotions at work (Follmer & Jones, 2018). Employee anxiety and depression impose steep costs on organizations and result in suffering that must be endured while employees are at work. Such emotion-based mental illnesses are unfortunately common, yet the field of management does not have a conceptual framework by which to study these severe emotions. Our research addresses this issue by adapting and testing affective events theory in the study of clinical anxiety and depression. We argue that transient workplace events can give rise to emotion states that exist outside the normal range, which then influence attitudes and behaviors. Specifically, we suggest that it is the combination of negative events and individual predispositions toward clinical anxiety and depression that generate the highest-level state symptoms of anxiety and depression.

The results of our first two ESM studies provide evidence that negative events, both typical and atypical, increase individuals' anxious and depressive states, particularly for individuals predisposed towards such clinical symptomology. These clinical emotions in turn have a negative impact on work goal progress, self-efficacy, and job satisfaction. Importantly, our data utilized widely validated instruments developed by clinical psychologists to identify these emotion states outside the normal range. Using these validated tools, we found that some of

our participants were experiencing levels of anxiety and depression above widely accepted cutoffs to be categorized as clinically significant. In many cases, these state experiences were severe. Table 9 summarizes the depressive and anxious symptomology observed in our data.

Averaged across our ESM studies, approximately 31% of all observations reported severe symptoms of anxiety throughout the day, while 5.38% reported severe symptoms of depression. At the trait level, approximately 12.5% percent of all participants indicated severe symptoms of anxiety and 4.59% indicated severe symptoms of depression. From another perspective, 50.76% of all participants across our three ESM studies exhibited no or minimal clinical symptoms of anxiety. For depression, this number was higher at 68.69%. In summary, our findings tell an important story. Anxiety and depression symptoms outside the normal range are common, and individual differences are important indicators of state symptoms. Second, it is not solely individual predispositions that generate anxiety and depression. Events at work activate these predispositions and result in significantly increased anxiety and depression symptoms. These symptoms are present in student samples as well as samples of employed adults and can have important downstream effects.

**Table 9***Summary of Reported Anxiety and Depression Symptoms Across Samples*

Study	Cutoff	Anxiety		Depression	
		Trait	State	Trait	State
		% of individuals	% of daily observations	% of individuals	% of daily observations
1A	Normal/minimal	51.90	35.96	70.30	73.26
	Mild	20.13	NA	16.23	7.83
	Moderate	16.23	18.03	11.04	13.20
	Severe	11.69	37.97	3.60	5.71
1B	Normal/minimal	39.07	37.38	72.82	77.44
	Mild	27.15	NA	18.53	7.13
	Moderate	17.21	18.59	6.61	8.40
	Severe	16.50	36.01	1.98	4.39
2	Normal/minimal	61.32	62.07	62.96	86.30
	Mild	17.71	NA	18.81	3.42
	Moderate	11.51	14.85	10.69	4.26
	Severe	9.44	19.10	8.20	6.03
Overall	Normal/minimal	50.76	45.14	68.69	79.00
	Mild	21.66	NA	17.86	6.13
	Moderate	14.98	17.16	9.45	8.62
	Severe	12.54	31.03	4.59	5.38

Note. Number of participants across all studies = 468. Number of ESM observations across all studies = 8,310.

## Theoretical Implications

Our research makes several contributions to theory. First, a review of prior work on workplace mental illness suggested there is no consistent conceptual paradigm to study these important issues. We expand AET, introducing this conceptual model as a framework for considering mental illnesses within the workplace. Our theoretical model demonstrates *if* and *how* anxious and depressive symptomology unfold for employees in real time. In doing so, we introduce a critical theoretical perspective on clinical anxiety and clinical depression—notably that trait symptomology and transient events dynamically generate state anxious and state depressive symptoms. Every day, employees encounter events that may generate clinical levels of anxiety and depression. Consider, for example, an employee who makes a mistake at work. If that employee were high in trait anxiety, he or she may react with intense feelings of worry about an upcoming task and become unable to concentrate. That employee may even begin to experience somatic symptoms such as sweating, dizziness, and trembling. Or, if the employee were high in trait depression, he or she may experience feelings of worthlessness and pessimism about his or her abilities and become intensely sad. These experiences can be crippling, and our results show they can have effects which carry over time. Understanding the role that clinical traits and work events play in these dynamic experiences is worthwhile.

Moreover, our findings shed light on the distinctiveness of anxiety and depression in workplace settings. This is an important finding, considering the high comorbidity between these two illnesses in the general population (Kessler et al., 2012; Mineka, Watson & Clark, 1998). In fact, several scholars have doubted whether anxiety and depression are independent constructs due to their high correlations (e.g., Kessler et al., 1992; Barlow & Campbell, 2000). In our ESM studies, we show that while anxiety and depression are related, their nomological nets are

empirically distinct, with anxiety and depression each demonstrating effects above and beyond the other when predicting work goal progress, self-efficacy, and job satisfaction. Although we predicted that anxiety and depression would show identical patterns in response to workplace events, this was not always the case. Indeed, our findings show discernable patterns in anxiety and depression at work, consistently finding that anxious symptomology is both more prevalent and more responsive to negative workplace events than is depressive symptomology.

Further, very little research has examined trait and state symptomology simultaneously (Change & McCarthy, 2018). Importantly, Rodell and Judge (2009) explored the effect of hindrance and challenge stressors on state anxiety in a workplace sample using an AET framework. They considered both state anxiety and individual traits. However, the traits they examined were subclinical. Specifically, they examined extraversion and neuroticism as moderators of the event-anxiety relationship. They did not find support for the predicted interaction between traits and affective events. Our theorizing and the results from our studies show that both state and trait symptoms of anxiety must be considered simultaneously.<sup>2</sup> Certainly, by incorporating AET's multilevel perspective to both anxiety and depression, our research answers the call for a more holistic understanding of employee experiences of mental illness (Follmer & Jones, 2018), and demonstrates the complex, dynamic nature of clinical anxiety and depression from multiple perspectives. Whereas some ESM research on state anxiety exists in the clinical psychology and psychiatry literatures, very little research in any field exists on state depressive symptomology using intensive longitudinal designs.

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<sup>2</sup> While Rodell and Judge (2009) did not consider clinical traits, they also did not use a measure of clinical state anxiety. Instead, they utilized a state measure of anxiety capturing two adjectives, *anxious* and *nervous*, based on the PANAS-X (Watson & Clark, 1994) and the Job-Related Well-Being Scale (Van Katwyk, Fox, Spector & Kelloway, 2000).

We also contribute to the literature on employee self-efficacy, job satisfaction, and work goal progress by moving away from more stable perspectives, which focus solely on traits or features of the environment. Our ESM data showed substantial within-person variation in state clinical symptomology, but also in self-efficacy, job satisfaction, and work goal progress, supporting this theoretical view.

Finally, two additional contributions are worth mentioning. Rather than using distal proxies or stable work features, we examine stochastic events (ranging from high probability of occurrence to low probability of occurrence). This provides a strong test of AET in our clinical context. Additionally, our results demonstrate the theoretical predictions made by Weiss and Cropanzano (1996) translate to clinical emotions and clinical traits. This represents a particularly robust test of AET's predictions, which were originally made only to consider normal emotion states and trait affect. We hope that our theorizing and results make the study of anxiety and depression more accessible to organizational behavior scholars.

### **Strengths and Limitations**

Our paper has several strengths that improve the validity of our findings. We used multiple research designs to test our conceptual model – ESM survey measures three times a day, a diary study, and a natural experiment. Each offers distinct methodological advantages. Our person-centric, process-focused theorizing makes ESM an ideal methodology for capturing complex, dynamic phenomena in real time. Further, we included time-series techniques in addition to multilevel modeling in each of our analyses, which improves causal inference. We did so whole, controlling for generalized cyclical patterns across the work week (Beal, 2015). Finally, we examined work events that vary in their likelihood and found similar results for each, across both

student and employee samples, which adds to the generalizability to our findings. Nevertheless, despite the strengths of our studies, we recognize limitations that can promote future research.

One limitation is that our independent and dependent variables were self-rated. While it is recognized that self-report data are the best method for capturing emotion states and perceptions (Gabriel et al., 2019), there is still potential common method bias inherent to ESM designs when they rely on self-report data. We took a number of steps to address this concern. By centering our independent variables, we eliminated certain individual response tendencies that have been shown to introduce bias (Enders & Tofighi, 2007). We also incorporated random slopes and intercepts when estimating our effects. Furthermore, while intensive longitudinal designs result in data that are captured over time, bias can be introduced into data which are captured within short time periods (Beal & Weiss, 2003; Beal, 2015). We account for this possibility in our design by measuring our pretest at least one week in advance of ESM data collection. This design separates key independent variables from the mediating and dependent variables in our model. Statistically, we use time-series techniques which account for the carry-over effects in our dependent and mediating variables. We also include controls for generalized cyclical patterns in affect. We do this by controlling for the lag of our dependent variables and the cosine of the day of the week, as well as imposing an autoregressive error structure to our data (Beal, 2015; Schafer & Wells, 2006). Nonetheless, the only way to truly eliminate these concerns is to utilize an objective event, which is a core strength of the second essay of this dissertation.

### **Suggestions for Future Research**

We provide suggestions in three domains we believe warrant future research. First, more research on the workplace antecedents to anxious and depressive symptomology is needed. Second, research can elaborate on the process by which anxiety and depression affect workplace



outcomes by introducing new mediators and testing models of serial mediation. Third, future research could also extend our theorizing to shed light on how state clinical anxiety and depression affect other outcomes at work, considering both the dark sides of anxiety and depression, but also their bright sides (e.g., Change & McCarthy, 2018; Andrews & Thompson, 2009). Each of these suggestions is discussed in more detail below.

### ***New Antecedents***

Future research could explore how distal features of the work environment result in affective events and clinical symptoms. For example, in a review of physical work environments, Ashkanasy, Ayoko, & Jehn (2014) argued that features of the physical work context such as high-density open office spaces, noise, and a lack of privacy can result in affective events. These resulting events may subsequently engender conflict, withdrawal and territorial behaviors. While Ashkanasy and colleagues predicted these environmentally induced workplace events would result in anger and frustration, it could be the case that distracting physical spaces could generate clinical symptoms of anxiety and instill desire to withdraw inward over time.

Additionally, research might explore the relationship between organizational culture, affective events, and employee anxiety and depression. Scholars have often examined the outcomes of organizational features on various normal emotions. However, research could benefit from understanding how office norms delineate and create affective events. Yip, Levine & Brooks (*in press*) suggest several possibilities. First, they argue that results-orientated cultures may leave employees with challenging goals, constrained job resources and time pressure. All of these could trigger employee anxiety. Second, they suggest that within cultures that do not have strong norm intensity, deviant behavior becomes normative. Weak cultures therefore introduce uncertainty into the environment and a lack of control over norm violation by employees. Third, some cultures

have strong, but competing, norms across differing groups. This can result in micro-cultures and tribalism across an organization which might generate interpersonal conflict and subsequent anxiety. Finally, a lack of fit between employees and culture could be a source of affective events. Yip et al. highlight that value incongruence may result in social systems which impede certain interactions necessary for goal accomplishment and can result in ambiguous communication and conflict (e.g., Perrewe & Hochwater, 2001). It may be the case that individuals experience unique affective events when their values are incongruent with those of their organization, or that the events they do experience result in different affective reactions. Importantly, while Yip and colleagues' review focused on anxiety, correlational evidence suggests that value congruence decreases depressive symptomology in high-stakes situations (Lamiani, Dordone, & Argentero, 2017). As such, value congruence may facilitate or attenuate the relationship of negative events on depressive symptomology.

In addition to exploring how environmental features may create affective events, scholars should explore differing qualities of work events. In this research, events with both high and low probabilities of occurring were analyzed. However, other qualities of events can have important effects. For example, some events are not in one's control while other events can be avoided. Likewise, some events may have interpersonal or social components while others take place in private. These events may not unfold in the same way. A public mistake which could have easily been avoided might make one feel greater levels of depression and pessimism compared to an event which takes place in private and was unforeseeable. Additional research should disentangle the differing qualities of events and their relationship to state experiences of anxiety and depression.

Research might also examine how individuals react to positive events at work. For example, Bono et al. (2013) showed that both positive and negative events throughout the workday independently contribute to employee stress, physical complaints, and mental complaints in the evenings. While Bono and colleagues did not use validated scales to capture mental health symptomology, their results suggest that positive events can alleviate negative somatic and mental symptoms. Additional research should further explore whether trait differences in anxiety and depression alter these relationships and whether these effects transfer to clinical symptoms of anxiety and depression. Of particular interest is the effect of positive events for individuals experiencing symptoms of depression. It could be the case that positive affective events have smaller effects for those with depression than for non-depressed individuals, although this may vary for those with bipolar depression (e.g., Galvez, Thommi, & Gaemi, 2011).

Additionally, it is not the case that *only* individuals predisposed to clinical anxiety and depression experience emotion states outside the normal range in the wake of a negative event. Our data show that, while less common, individuals not predisposed to clinical anxiety and depression can experience severe levels of these emotions in the wake of workplace events. Future research should explore what situations might result in state anxious and depressive symptomology for those who are not predisposed to experience such events. Extant research may guide our thinking. Some evidence suggests that work stressors may be an important factor in the onset of new mental illnesses. In a longitudinal study of 972 New Zealand participants, Melchior and colleagues (2007) demonstrated that excessive workload and extreme time pressures at work were significant predictors of major depressive disorder (MDD) and generalized anxiety disorder (GAD) for individuals who had no history of experiencing such illnesses. It may be the case that

specific work events, especially those which are chronic and extreme, result in emergent symptoms of anxiety and depression in adulthood.

Research on workplace trauma may provide insight into *if* and *how* symptoms of anxiety and depression unfold after traumatic affective events. Research on traumatic events suggests that trauma may result in subsequent depression and anxiety through post-traumatic stress (e.g., Martin, Marchand & Boyer, 2009; Bjørkelo, 2013) and even vicarious experiences of trauma in workplace environments can have important effects, both positive and negative (e.g., Ortlepp & Friedman, 2002, Maitils, 2020).

Finally, focusing on specific individuals at work as a source of affective events may prove a useful direction for future research. Cropanzano, Dasborough, and Weiss (2017) predict that leader emotion displays can serve as affective events. Researchers could explore whether facial expressions of leaders experiencing anxiety and depression have contagion effects. It may be the case that clinical emotions have greater (or lesser) contagion effects than emotions in the normal range. For depression, there may be interesting effects surrounding the contagion of positive emotion expressed in others, as anhedonia and a focus on mood-congruent information is commonly associated with depression. Scholars have shown that leader affect influences follower performance through emotional contagion (Visser, van Knippenberg, Van Kleef, & Wisse). This has been shown to apply to phenomena not normally considered by emotional contagion researchers, such as leader humility or workplace deviance (e.g., Owens and Hekman, 2016; Robinson & O’Leary-Kelly, 1998). Indeed, research from clinical psychology and psychiatry provides some evidence depressive symptomology can spread across individuals who live together (e.g., Joiner & Katz, 1999; Prinstein, 2007). Likewise, some experimental evidence suggests

anxiety may spread through emotional contagion (e.g., Gump & Kulik, 1997). However, more research is necessary to understand how these effects may carry over to work environments.

### *New Mediators*

Future research should explore potential sequential mediators that we do not test in our model. For example, cognitive interference, hypervigilance, and emotional exhaustion are common consequences for individuals with anxiety and/or depression (e.g., Hallion & Ruscio, 2011; Sylvers, Lilienfeld, & LaPrairie, 2011; Chang & McCarthy, 2018). These constructs could be considered micro mediators between state anxiety, state depression, and our workplace outcomes. For example, a recent meta-analysis by Koutsami, Montgomery, and Georganta (2019) found a significant association between anxiety, depression, and burnout, noting that studies found a particularly high relationship between anxiety and emotional exhaustion. Likewise, in a meta-analysis of depression and cognitive functioning, significant correlations were found between depression, episodic memory, executive function, and processing speed (McDermott & Ebmeier, 2009). It may be the case that symptoms of anxiety and depression result in a series of changes in employees that ultimately result in lower performance and poorer work attitudes. Research should explore the serial mediating effects of workplace events through clinical emotions and their related consequences.

Anxiety and depression have important consequences that could affect job performance, which were not considered in our research. Attentional control theory suggests that anxiety may inhibit individuals' ability to efficiently shift attention across tasks and inhibit attention towards task-irrelevant stimuli (Cheng & McCarthy, 2018). In depressed individuals, recollection of positive events and emotions in memory is suppressed, and a general tendency or preference towards mood congruent stimuli has been found (Everaert, Pudina, & Coster, 2017). Future

scholars could further differentiate the nomological nets of anxiety and depression by looking at the serial mediating effects of anxiety and depression via their various neurological and biological consequences (Mineka, Watson, & Clark, 1998).

Finally, anxiety and depression represent the common colds of mental illnesses, but they are by no means the only mental illnesses which are candidates for study in an AET framework. For example, our research focused on unipolar depression and generalized anxiety. Future scholars could explore bipolar depression, and other cases of anxiety disorders such as panic disorder and social anxiety disorder. Anger disorders as well as substance use disorders are also promising areas future researchers could examine to determine how work events result in various symptomologies.

### *New Consequences*

Anxiety and depression have been linked to functional somatic symptoms (FSS) which may affect performance at work, health, and can even result in claims of physical disability (Mayo Clinic, 2018). These symptoms, which include physical complaints without a known organic medical cause, represent approximately 33% of all somatic symptoms reported to doctors (Kroenke et al., 1997). Functional somatic symptoms include muscle and joint pain, headaches, nausea, and non-cardiac chest pain (Achenbach, Dumenci, & Rescorla, 2003) and have been shown to be a strong consequence of anxiety and depression, especially in situations of comorbid anxiety and depression (Jansens et al., 2010; Huang, Mykletun, & Dahl, 2014). Future scholars should explore how state experiences of anxiety and depression result in physical symptoms not rooted in an underlying medical condition. It may be the case that state experiences of mental illness increase state physical symptoms, which are both unrelated to underlying biological medical conditions and fall outside the symptomology of anxiety and depression diagnoses.

In contrast to the negative outcomes of anxiety and depression, researchers might explore some of the positive outcomes known to result from mental illnesses. For example, research has shown that outcomes such as individual creativity and empathy can result from individual experiences of mental illness (e.g., Akinola & Mendes, 2008; O'Connor, Berry, Lewis, & Mulherin, 2007; Galvez, Thommi, & Gaemi, 2011). Furthermore, anxiety may have a curvilinear relationship to job performance, such that low to moderate symptoms of anxiety increase performance, while high to severe levels of symptoms lower performance (Chang & McCarthy, 2018; Yip et al., 2021). Depression has also been shown to have adaptive features (Andrews & Thompson, 2009). Incorporating such findings and counterstereotypes into our theorizing could yield dividends for the study of mental health at work, ultimately helping individuals with mental illness to thrive.

Research on post-traumatic growth suggests that the psychopathology of individuals who experience workplace trauma is complex and warrants future study (e.g., Maitlis, 2020; Vogel & Bolino, 2020). Incorporating affective events theory into the study of workplace trauma may provide important insights, as most non-AET research is retrospective, uses inconsistent measures, and is cross sectional in nature (Maitlis, 2020). Extreme context research (Hällgren, Rouleau, & De Rond, 2018) could prove particularly useful for the study of traumatic events. Certain occupations are inherently traumatic (e.g., military: Tsai, 2015; police: Chopko, Palmieri, & Adams., 2018; emergency services: Shakespear-Finch, et al., 2013; and rescue services: Shamia, Thabet, & Vostinos 2015), and identifying the effects of trauma in these contexts is an important first step towards generalizing how traumatic events unfold in “ordinary” work environments.

### **Managerial Implications**

Our research has important practical implications for managers. According to Ilgen (1999; 2006), for workplaces to have effective and productive teams, managers have three general options. First, managers can focus on selection. Second, managers can focus on training and development. Third, managers can change the work situation. We consider each in light of our findings.

### ***Selection***

Employee selection has a rich history of findings that link the selecting of individuals with knowledge, skills, abilities, and other characteristics (KSAO) to successful career outcomes and performance (Ployhart, Schmitt, & Tippins, 2017). The axiom of such research is to hire individuals most likely to succeed based on their scores across validated KSAO measures. Selection of employees based on predispositions towards anxiety and depression is complex for several reasons. First, individuals with mental illness are legally protected under the Rehabilitation Act of 1973, Americans with Disabilities act of 1990, and the ADA Amendment act of 2008 (Follmer & Jones, 2018). Business decisions based on individual diagnoses of anxiety and depression are prohibited. Nevertheless, formal requests for accommodation expose individuals to stigmatization and discriminatory behaviors (e.g., Brohan et al., 2014), reducing the likelihood that individuals benefit from legal protections. Regardless, given these concerns and the findings of our paper, even in situations where formal diagnoses of anxiety and depression are not considered, extreme caution is warranted. Apart from the legal issues, our results did not look at job performance and cannot contribute to a discussion of objective employee performance. Anxiety, at least at low or moderate levels, may well increase performance (Change & McCarthy, 2018; Yip et al., *in press*). Likewise, scholars have demonstrated a bright side to depression, particularly when it comes to complex problem solving through processes of analytical rumination (Sevcikova



et al., 2020; Dulisko, Mulsant, & Andrews, 2015; Andrews & Thompson, 2009). Specifically, these scholars argue that depressive symptomology can promote analytical thinking on certain complex problems by prioritizing attention to the problem at hand while inhibiting attention to pleasant distractors.

Given the prevalence of anxious and depressive symptomology in our research, it is likely that organizations already employ individuals experiencing diagnosable mental illness. Selection is not an easy solution, and one that we caution must not be utilized carelessly. Selection aside, our data suggests that supervisors should be aware that clinical anxiety and depression are common. It is likely that some employees experience clinical levels of anxiety and depression while at work.

### ***Employee Development, Treatment, and Interventions***

Most of the research considering organizational perspectives on mental illnesses are focused on the direct costs of treatment, as well as their indirect costs through absenteeism and reduced productivity (e.g., Liang & Jones, 2016; Williams, Shah, Wagie, Wood, & Frye, 2011). This body of research has demonstrated the significant cost burden anxiety and depression impose on organizations. These findings are consistent with our research, although we did not measure health-care costs or productivity of our participants.

Critically, anxiety and depression are treatable illnesses, and treatment appears to be cost effective (e.g., Simon et al., 2009; Kessler et al., 1999). Generally, treatment for mental illness results in a reduction in absenteeism and increased productivity (e.g., Dewa, Thompson, & Jacobs, 2011). Furthermore, adherence to treatment has been shown to reduce the time lost to depression-related absence from work (Dewa, Hoch, Lin, Petterson, & Goering, 2003). These trends are consistent globally. A study by Chrisholm and colleagues (2016) found that, globally, the net

returns to increased investment in treatment of common mental disorders between 2016 and 2030 ranges from 3.3 and 5.7 to 1, when considering direct economic gains as well as increased health returns. Additionally, they estimate that such scaled-up treatment would result in 43 million years of extra healthy life (Chrisholm et al., 2016).

Finally, there are empirically supported interventions that workplaces may utilize to aid in the prevention of anxiety and depression as well as facilitate the recovery of employees who have been diagnosed with depression and anxiety. In their meta-analysis of 481 primary research studies, Joyce and colleagues (2011) identified several workplace interventions with strong effects for improving symptomology and workplace outcomes in employees with anxiety and depression. Particularly relevant to our findings are the Cognitive Behavioral Therapy-based stress management interventions, which were shown to have some of the strongest intervention effects. These CBT-based interventions may help participants navigate the negative events they experience at work.

### ***Change the Situation***

While individual managers cannot offer treatment themselves, our research suggests that the literature on workplace accommodations for employees with mental illness may help employers. Our participants reported atypical negative work events in approximately 10% of the survey responses across studies. Research on workplace accommodations offers possible suggestions which managers may implement to help employees experiencing anxiety and depression in the wake of atypical affective events. For example, in a sample of 784 Canadian adults eligible for workplace accommodations for having a mental illness, researchers found that

regular meetings with supervisors, exchanging work tasks with colleagues, and quieter workplaces were most necessary for successful job performance (Wang et al., 2011). Such accommodations are not difficult to implement and generally impose no direct costs to organizations (MacDonald-Wilson et al., 2002).

Exposure to abusive supervision has been linked to anxiety and depression (Tepper, Moss, Lockart, & Carr, 2007; Tepper 2000; Pyc, Meltzer, Liu, 2017), while supportive environments have been shown to improve the well-being of all employees, particularly those experiencing anxiety and depression (e.g., Corbière et al., 2015; Mahan et al., 2010). Managers can strive towards functional leadership styles over dysfunctional leadership styles and promote support for employees. This may help address a significant practical problem related to anxiety and depression—many employees do not seek the treatment they need (Mojtabi, et al., 2011; Wang et al., 2005). This is for several reasons, including stigma (Van Voorhees et al., 2005), financial concerns (Mojtabai, 2005), and structural barriers to making a treatment-related appointment (Sareen et al., 2007). By reducing abusive supervision and fostering support, managers can create an environment which may result in reduced stigma for persons with mental illness, which subsequently increases treatment and utilization of support services.

### **Conclusion**

Our work shows that negative work events can result in clinical anxiety and depression. We expand AET to include emotion-based mental illnesses and show that employees' state anxiety and depression can extend beyond the normal range when negative work events take place. As a result of individuals' increased state anxiety and depression, we see a decrease in state job satisfaction, self-efficacy, and work goal progress. As predicted by AET, we demonstrate that these effects are much more pronounced in individuals prone to anxiety and

depression. Further, our study suggests that participants reported symptomology, both in the trait and state level measures, which exceeded the normal range and are above widely accepted cutoffs to be considered severe levels anxiety and depression symptoms. We hope our research highlights the value of studying clinical anxiety and depression at work utilizing an AET conceptual framework, and that future researchers continue to examine these understudied, albeit common and costly, experiences at work

## **Essay 2: The Effects of Intimate Partner Violence on Coworker Mental Health**

Intimate partner violence (IPV) is a chronic public health issue with consequences extending far outside the home. IPV is defined as physical, sexual, or psychological aggression towards an intimate partner (Breiding, Basile, Smith, Black, & Mahendra, 2015). IPV makes up 15% of all violent crime (Truman & Morgan, 2014), and over the course of a lifetime, about 25% of women and 8% of men will fall victim to some sort of IPV (Tjaden & Thoennes, 2000). Direct victims of IPV suffer heavy consequences, including physical injury and mental-health issues such as anxiety, depression and even suicidal tendencies (Swanberg, Logan, & Macke, 2005). Unfortunately, the consequences of IPV extend beyond the immediate targets to secondary victims such as family members (Hamby, Finkelhor, Turner, & Ormrod, 2011; Margolin, 1998; Smith, Fowler, & Niolon, 2014).

Although less widely investigated, studies have found that IPV has negative spillover consequences in the workplace (Mighty, 1997) and even vice versa: work stress can manifest as family violence (Barling & Rosenbaum, 1986; Eckenrode & Gore, 1990; Johnson, Todd & Subramanian, 2005; Restubog, Scott, & Zagenczyk, 2011). Battered partners report more tardiness (Raphael, 1996; Swanberg & Logan, 2005), absenteeism (Friedman & Couper, 1987; Taylor & Barusch, 2004), and turnover (Romero, Chavkin, Wise, & Smith, 2003). As one might expect, job performance and productivity suffer (Reeves & O'Leary-Kelly, 2007), with estimates ranging between \$1 billion and \$5 billion to the entire economy (Swanberg et al., 2005). These available estimates, which consider lost productivity, health care costs, and the like, only account for direct violence against individuals. As with children, who are affected by the secondary violence they witness while growing up (Briggs-Gowan et al., 2015), close co-workers could likewise be harmed by the injury done to their peers (Duffy, Scott, & O'Leary-Kelly, 2004).

Vicarious violence—violence empathically experienced by observing others—is more common than direct violence, which is personally experienced (Dupré, Dawe, & Barling, 2014). Research suggests that vicarious violence can lead to somatic symptoms (e.g., headaches, disrupted sleep, and gastrointestinal problems), poorer work attitudes, more negative emotions, and a desire to find a new job (Rogers & Kelloway, 1997; Schat & Kelloway, 2003). Extending research on workplace violence, the present study investigates what we are calling “vicarious IPV.” We argue that vicarious IPV is a type of affective event, and exposure to IPV will result in subsequent affective reactions (Weiss & Cropanzano, 1996). As with other acts of violence, we anticipate that vicarious IPV will have negative effects on coworkers’ mental health and work goal progress. Research on this idea is limited, though consistent with affective events theory, which considers events as the proximal causes of affective reactions. According to Duffy and her colleagues (2004), IPV has both primary survivors, who are directly battered, but also secondary aggrieved, such as coworkers who know of the abuse faced by their peers. Duffy et al. suggest that coworkers may come to experience many of the same ill-effects as those experienced by directly affected individuals (see also Swanberg et al., 2005). We examine this possibility in the present study.

### **Challenges in Researching Intimate Partner Violence**

Ethical researchers cannot create or passively allow violent abuse. Consequently, research on vicarious violence tends to be limited to retrospective self-reports (e.g., Rogers & Kelloway, 1997; Schat & Kelloway, 2003), raising the possibility of recall bias (e.g., Pollyannaish people may underestimate the negative effects). Worse still, we do not know of any studies that have investigated the impact of vicarious IPV on coworker mental health and effectiveness. Most theory also appears limited to direct IPV, paying less attention to its

vicarious counterpart (e.g. Mighty, 1997). In addressing these challenges, we build on an opportunistic situation. We explore an actual act of intimate partner violence using an ESM design to capture daily, clinical symptoms of anxiety and depression and daily goal progress as a result of an IPV event. Our present study was originally designed to monitor the daily mental health of employees over a four-month period. About eight weeks into the study, a husband murdered his spouse, both of whom were employees in the same work unit. He subsequently abandoned her body and committed suicide. Although the tragedy took place offsite, it was obviously known to co-workers. However, our research team did not learn of the event until some weeks later, after data collection had been completed.

We are mindful of three considerations. First, IPV is a very serious social problem. If coworkers are also harmed, then IPV is even more pernicious than was previously believed. This possibility merits further investigation. Second, though our present study was not designed to investigate vicarious IPV, it is ideal in a number of respects – a violent event occurred, and the researchers were “blind” to it. In addition, we have daily mental-health and goal-progress data both preceding and following the two deaths. We also collected individual differences measures of anxious and depressive dispositions, which were taken during the pre-test (i.e., well before the violent event). Third, the data we collected allow us to explore two features of vicarious IPV. Finally, by examining the psychosocial proximity of coworkers to victims, we can assess the range of individuals who are impacted. We argue that vicarious IPV is more problematic for those who work closely with the victims, as opposed to those with more distal working relationships. IPV has been found to create vast human suffering, quite apart from making organizations less effective. Based on these earlier findings, we draw on existing theories to better understand the consequences of IPV for coworker mental health.

## **Vicarious IPV and Coworker Mental Health**

We explore the impact of vicarious IPV on clinical mental health symptomology among co-workers. Clinical symptomology of mental health is rarely included as an outcome in the organizational literature (Follmer & Jones, 2018), though mental illness costs U.S. employers upwards of \$100 billion, and \$1 trillion globally, in annual productivity losses (Sime, 2019). Evidence suggesting a relationship between vicarious IPV and mental illness is limited, though the idea is not inconsistent with available evidence. For example, there is some indication that exposure to other sorts of violence decreases general mental health (Rogers & Kelloway, 1997) and emotional well-being (Schat & Kelloway, 2003). Likewise, professionals who are indirectly exposed to traumatic events, such as attorneys, therapists, journalists, and social workers, are at risk for anxiety and depression (Levin et al., 2011; McCann & Pearlman, 1990; McMahon, 2001). Further, those who just observe or hear about the event through a third-party, such as a media outlet or class, are also at risk for severe psychological effects such as secondary traumatic stress (Zurbriggen, 2011), which is highly comorbid with depression and anxiety (Bride, Robinson, Yegidis & Figley, 2004). Research on secondary exposure to IPV is particularly limited. However, developmental psychologists have found that children who have observed IPV tend to experience anxiety (Briggs-Gowan et al., 2015) and recurring depression (Kessler & Magee, 1994). Given these considerations, we expect that vicarious IPV will increase clinical symptoms of anxiety and depression among employees. Mental health issues, in turn, may adversely impact workers' ability to do their best work (Quelch & Knoop, 2018).

A second consideration to our research questions has to do with the level of proximity that workers have to the vicarious IPV. Though vicarious violence is painful, all individuals are unlikely to be impacted to the same degree (Hällgren, Rouleau, & De Rond, 2018; Hannah, Uhl-



Bien, Avolio & Cavarretta, 2009). Some individuals will work more closely with the victim(s) than do others. In the violent act considered here, we compared the former group—those with greater psychosocial proximity—to others with lower proximity (Hannah et al., 2009). Those with higher proximity were individuals who worked in the same types of jobs and at the same facility as did the perpetrator and the victim. Those with lower proximity worked in different jobs and/or at a different location.

*Hypothesis 1: Average daily anxiety symptoms will increase post-violence more for those with greater psychosocial proximity to the violence.*

*Hypothesis 2: Average daily depression symptoms will increase post-violence more for those with greater psychosocial proximity to the violence.*

Aside from the risks that violence presents to the mental health of individual workers, it may also put business outcomes at risk (Rogers & Kelloway, 1997; Schat & Kelloway, 2002). As described in the previous chapters, individuals who struggle with clinically significant levels of anxiety tend to overestimate danger and be on the constant lookout for potential threats in the environment (DSM-V, 2013). In some cases, this hypervigilance to potential threats may make it difficult for overly anxious employees to focus instead on the work tasks necessary for organizational productivity (Marciniak, Lage, Landbloom, Dunayevich & Bowman, 2004; Ophuis et al., 2017). To test this possibility, we examine the impact of anxiety on work goal progress. We also predict that vicarious IPV will be associated with a subsequent decline in employees' reported ability to complete their work goals.

*Hypothesis 3: Average daily progress on work goals will decrease post-violence more for those with greater psychosocial proximity to the violence.*

According to Rogers and Kelloway (1997), workplace violence is likely to cause fear. This fear, in turn, should cause other outcomes, such as lower job performance. While the model has been generally supported (Schat & Kelloway, 2003), later findings determined that fear tended not to mediate other outcomes (LeBlanc & Kelloway, 2003). We suggest that fear, though important, might not have had a strong mediational effect. Anxiety, particularly at pervasive, clinically significant levels, could result from violence (Hypothesis 1) and perhaps influence subsequent work behavior. In short, we test Rogers and Kelloway's original contention, arguing instead that clinical levels of anxiety serve as a mediator.

*Hypothesis 4: The indirect effect of an IPV event on employees' average progress towards work goals would be mediated by average state anxiety for only those employees with close psychosocial proximity to the victim.*

As the theory and results from the previous essay suggest, it is unlikely that all workers will be affected to the same degree. Between 19% and 8% of the American population have been diagnosed with an anxiety or depressive disorder, respectively, in the last year (ADAA, 2019; NIMH, 2019). These disorders have the propensity to affect an individual's lens on their experiences, and in some cases distort interpretations of events in maladaptive ways (Nolen-Hoeksema, Parker, & Larson, 1994). Further, persons who are prone to anxiety or depression show more intense reactions to stressful events (e.g., Boffa et al., 2016; Morrill et al., 2008). Thus, we predict trait anxiety and depression will have an increasing effect on daily symptoms of anxiety and depression post-IPV:

*Hypothesis 5: The indirect effect of IPV on employees' progress towards work goals will be mediated by state anxiety, but only for those with (a) close psychosocial proximity and (b) high trait anxiety. This will take the form of a*

*three-way interaction whereby individuals with high levels of trait clinical anxiety and greater psychosocial proximity to the violence will see an increase in state anxiety over time.*

*Hypothesis 6: The indirect effect of IPV on employees' progress towards work goals will be mediated by state depression, but only for those with (a) close psychosocial proximity and (b) high trait depression. This will take the form of a three-way interaction whereby individuals with high levels of trait clinical depression and greater psychosocial proximity to the violence will see an increase in state depression over time.*

### **Method**

All data presented here represent an ESM study of a workplace wellness program. During a four-month wave of the program, an estranged husband killed his former spouse and subsequently committed suicide. Those killed were not participants in the research. However, some participants had extensive experience working with the employees who died, while others did not (e.g., some worked in the same building and department while others worked at a different work site and/or in different departments). These differences lead to an effective treatment group (high proximity employees who worked in the same location with the individuals involved) and control group (low proximity employees who did not work in the same location as the individuals involved). In addition to a treatment and control group, we collected intensive longitudinal data before and after the murder/suicide took place. For both groups, this included state and trait measures of clinical anxiety and depression, and state measures of work goal progress.

Consequently, in this study we employ a natural experimental design in combination with experience sampling methodology and multilevel autoregressive techniques to understand the effect IPV between colleagues has on employee mental health and self-reported progress towards work goals. To our knowledge, this is the first ESM study testing the impact of vicarious IPV on mental illness symptomology. Similar to a randomized control trial, the effect of interest in our first three hypotheses is the *difference* between the level of anxiety and depression symptomology and work goal progress (Y) that would be observed if an individual employee, *i*, *were* exposed to the murder/suicide of married colleagues, and the value of anxiety and depression symptomology that would be observed if employee, *i*, *were not* exposed to the murder/suicide of married colleagues.

More formally, the effect of interest is expressed in the formula below:

$$\delta_i = Y_i^T - Y_i^C \quad (1)$$

### **Sample and Participant Selection**

The study was conducted in a large healthcare organization, which was located in the Western region of the United States. Participants were recruited by the healthcare organization based upon their insurance risk profile. This resulted in a sample of employees who were likely to see the greatest benefit from a workplace wellness program, from the healthcare organization's perspective. The mean age of participants was 51.79 years with a standard deviation of 11.2, and approximately 79% of the participants were female. One participant retired amidst data collection before the violent event took place. His responses were omitted.

### **Assessments and Measures**

Data collection consisted of once-a-day diary surveys that were sent to participants at 4:00 PM Monday through Friday every other week over the course of four months. Participants

were asked to complete this survey referring to their experiences at work during the day.

Participants were allowed to take the survey after they had left work. Thirty-one participants provided a total 766 diary survey responses. Responses were provided both prior to and after the murder-suicide took place. Having participant responses before and after the unexpected event allows us to explore the effect of the event on the “lived experiences” of participants involved (Rosen, Koopman, Gabriel & Johnson, 2016).

IPV was a dichotomous variable indicating a 1, if the data were collected after the murder-suicide took place, and a 0, if the data were collected before the murder-suicide took place. To measure the time distance around the event, we also assessed the number of days before or after the murder-suicide that an observation was collected. The variable is centered on the date of the event such that observations collected before the event took place are negative and days after the event are positive. For example, an observation that was collected ten days before the event has a score of -10 and an observation taken three days after the event has a score of 3.

In order to measure psychosocial proximity, we created another dichotomous variable with possible values of 0 and 1. The “1” represented participants who worked closely with the affected work unit and at the same work site as the victim and perpetrator. This variable is based on an organizational chart. Many of our participants, a little over two thirds ( $n = 21$ ), did not work with the victims. These were employees who worked at a different work unit, in a different location, or both. Thus, they served as a natural control group, receiving a 0 on this variable.

To measure trait anxiety, we administered the Beck Anxiety Inventory-II (Beck, Epstein, Brown, & Steer, 1988). The BAI-II is a highly validated scale commonly used in clinical settings. The scale ranges from 0 to 3 and is calculated using a total score ( $\alpha = .83$ ). To measure state anxiety in our daily surveys, we employed the state component of the short form of the

State Trait Anxiety Inventory (STAI-Y6, Marteau & Bekker, 1992). The STAI has been used extensively in research and clinical practice. The S-Anxiety scale (STAI Form Y-1) consists of six statements that evaluate how respondents feel “right now, at this moment.” Example items include “I feel upset,” “I am tense,” and “I am worried.” Likert responses range from 1 to 4 ( $\alpha = .87$ ). To interpret this measure, the sum of the responses is divided by six and multiplied by twenty, for a final score ranging from a minimum of 20 to a maximum of 80 (Marteau & Bekker, 1992; Van der Bij, de Weerd, Cikot, Steegers, & Braspenning, 2003).

To measure trait depression, we used the 21-item Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996), which is the most widely used measure of depression in intervention studies. The items range from 0 – 3. The instrument is scaled as a total score ( $\alpha = .93$ ). For ethical reasons, one item that referred to suicidality was omitted from this questionnaire after a discussion with the partner organization, which resulted in a total of 20 items. To measure state depression, we used the seven depression items from the Depression Anxiety Stress Scales (DASS, Lovibond & Lovibond, 1995). Participants were instructed to report feelings “right now, in this moment.” Sample items include “I feel down-hearted and blue” and “I feel I have nothing to look forward to.” The items range from 1 to 4 ( $\alpha = .89$ ).

Participants were also asked to indicate the extent to which they made progress on their work goals during the past day. They did so by using three items adapted from Wanberg, Zuh, and Van Hooft (2010). The items are “Today, I have made good progress on my work goals,” “Today, I have been productive,” and “Today, I have moved forward on my goals” ( $\alpha = .90$ ). The items range from 1 to 5.

We also included a number of control variables. Individuals differ in their trait levels of depressive and anxious symptomology. These differences could have confounded our results.

Unless otherwise noted, we controlled for trait levels in subsequent analyses. Given that anxiety and depression are comorbid conditions, we also control for the state symptomology of depression when predicting anxiety and vice versa for depression. Following from Beal and Weiss (2003), we also controlled for the day of the week in order to rule out time-related trends.

### **Analytical Approach**

Data are analyzed in two parts. First, a difference in mean change model is tested to examine the effects of IPV on proximate individuals' average levels of anxiety, depression, and work goal progress before and after the event took place (Bodner & Bliese, 2018). Second, we examine the within person effects and changes in trends after IPV, utilizing the longitudinal time distance variable and discontinuous growth modeling (Bliese, Adler, & Flynn, 2017). In particular, we examine how the effects of the event unfold over time, and how these effects may vary depending upon trait clinical anxiety.

We used mixed modeling in Stata 15 to test our first three hypotheses. Specifically, the model utilized is a combination of repeated measures and time series analysis, which is necessary with ESM data measuring affective states (Schafer & Walls, 2006; Hamaker, et al., 2018). Following the recommendations of Preacher, Zyphur, Zhang (2011), our between-person mediation hypothesis and the first stage moderated mediation model were tested. Bootstrapped confidence intervals and standard errors with 10,000 repetitions were conducted with the starting seed of 1234. For all mediation hypotheses, we examine a 1-1-1 mediation model (Preacher, Zyphur, Zhang, 2010) with indirect effects conditioned upon psychosocial proximity to the victim of IPV. For the models analyzing trends, we also condition the indirect effects upon individual predispositions to clinical anxiety. Specifically, we first examine the three-way interaction between time, psychosocial proximity, and trait anxiety. Then we test a second three-

way interaction between time, post IPV, and trait anxiety (Bodner & Bliese, 2018). These analyses were conducted using the generalized SEM command in Stata 15 (StataCorp., 2019) with a latent variable identifying the clustered structure of the data. To determine if a multilevel model was needed, we first ran a null model to examine the within-person variation inherent to each of our daily measures. The variance accounted for by the within-person component of our variables ranged between 29% and 62% representing the proportion of variation in our state measures that occurred within each participant over time. With the exception of our dichotomous variables, all level 1- independent variables were within-person centered, and our level two control variables were grand mean centered (Enders & Tofighi, 2007).

In combination, the multilevel and time series statistical techniques account for the nested and intensive longitudinal nature of the ESM data. For example, the time interdependence of the data call for time series techniques to account for the component of our dependent variables at time  $t$  which “carry over” or have “inertia” into time  $t+1$ . Likewise, repeated measures of participants call for multilevel techniques, given that the data are nested within individual participants, where some participants may start high and remain high while others do not. Both cases violate the independent and identically distributed (IID) assumption of the general linear model (GLM) and require appropriate statistical tools to account for interdependent observations (e.g. Schafer & Walls, 2006; Gabriel et al., 2019).

To understand the effect vicarious IPV has on mental health and work goal progress, the estimand of interest in our first three hypotheses is the difference in differences estimator. Logically, the difference in differences estimator present in this study takes the form ( $Y$  close psychosocial proximity, Post -  $Y$  close psychosocial proximity, Pre) - ( $Y$  distal psychosocial proximity, Post -  $Y$  distal psychosocial proximity, Pre). More formally, in the multilevel context



the interaction can be stated as  $[(\beta_0 + \beta_1 + \beta_2 + \beta_3) - (\beta_0 + \beta_2)] - [(\beta_0 + \beta_1) - \beta_0] = \beta_3$ . In other words, there is a difference score for the treatment group and a second difference score for the control group. Hypotheses are tested by examining the difference between these two difference scores. Specifically, our first three hypotheses are tested using the model specified in Equation 2 below.

$$Y_{it} = u + \alpha_i + \beta_{1t}\text{Proximity} + \beta_{2t}\text{PostMurderSuicide} + \beta_3\text{Proximity}_t \times \text{PostMurderSuicide}_i + \varepsilon_{it} \quad (2)^3$$

Where the error term,  $\varepsilon_{it}$ , can be found by:  $\varepsilon_{it} = \rho * \varepsilon_{it-1} + \zeta_i$  (3)

In this model,  $Y_{it}$ , represents participant  $i$  at time  $t$ 's state anxiety, state depression, and state progress towards their work goals. The terms  $u$  and  $\alpha_i$  represent the grand mean and the individual random intercept, respectively. The error term,  $\varepsilon_{it}$ , consists of an autoregressive (1) component  $\rho$  and an individual innovation error,  $\zeta$ , assumed to be distributed as  $\zeta \sim N(0, \sigma^2)$ . As such, the implied covariance matrix of the residuals for participant  $I$  consists of the components  $\sigma_{t, t-1} = \sigma^2 \rho^{|t-(t-1)|}$ . We follow the suggestions of Shafer and Walls (2006) in our analysis of intensive longitudinal data between differing groups. For a discussion of the appropriate error structure in a mixed model accommodating data within a multilevel intensive longitudinal context see (Rovine & Molenaar, 1998; Shafer & walls, 2006).

To examine within person effects and differences in trends, Hypotheses 5 and 6 were tested using a discontinuous growth model and procedures outlined in Hayes (2018). The three-way interaction is a first stage component of the moderated moderated mediation model.

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<sup>3</sup> Another way of representing this formula in multilevel notation is:  $Y_{it} = \beta_0 + \beta_{1t}\text{PostMurderSuicide} + r_{it}$ , where  $\beta_0 = \gamma_{00} + \gamma_{01}\text{Proximity} + \mu_{0t}$  and  $\beta_{1t} = \gamma_{10} + \gamma_{11}\text{Proximity} + \mu_{1t}$ . In this model  $\gamma_{00}$  and  $\gamma_{01}$  are fixed intercepts,  $\gamma_{01}$  and  $\gamma_{11}$  are fixed coefficients for Proximity, and  $\mu_{0t}$  and  $\mu_{1t}$  are residual terms. The autoregressive component exists within  $r_{it}$  in the form described in text.

## Results

Means, standard deviations, and correlations are in Table 10. As can be seen, trait anxiety and depression are moderately predictive of state anxiety and depression (.59 and .46 respectively). This justifies our decision to control for these individual difference measures. Also, as anticipated, both state anxiety and state depression predict work goal progress. The average level of state anxiety reported in this study is 38.24, which is just below the cutoff for state anxiety symptoms to be considered clinically relevant (Spielberger et al., 1970). The standard deviations of state anxiety demonstrate clinical levels of anxiety were present in many of our ESM observations. For depression, the mean was well below clinical cutoffs, however participants did report state symptoms that were above the normal range (Lovibond & Lovibond, 1995).

**Table 10**

*Means, Standard Deviations, and Correlations of Study Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. State Anxiety	38.24	12.35	0.58				
2. State Depression	1.98	5.20	0.55	0.66			
3. Work Goal Progress	3.73	0.76	-0.40	-0.34	.73		
4. Trait Anxiety (BAI)	7.78	5.98	0.59	0.45	-0.27	-	
5. Trait Depression (BDI)	8.08	8.54	0.39	0.46	-0.19	0.70	-

*Note.* All correlations are significant at the  $p < .01$  level.  $N = 766$ . Correlations along the diagonal represent correlations between measures centered within person and their uncentered counterpart.

**Table 11***Results of the Tests of Hypotheses 1-3*

Predictors	State Anxiety		State Depression		Work Goal Progress		Work Goal Progress <sup>1</sup>	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Psychosocial Proximity (PP)	2.41	3.92	-.54	0.44	0.22	0.23	.16	.22
Post Intimate Partner Violence (Post)	-.29	0.89	.99	1.68	0.10	0.08	.09	.07
PP X Post	4.3**	1.92	1.67 <sup>†</sup>	0.95	-.41**	0.16	-.31*	.15
State Anxiety	NA		NA		NA		-.20**	.04
Trait Anxiety (BAI)	1.15**	0.32	0.15	0.14	-0.03	0.02	-.03	.02
Trait Depression (BDI)	0.10	0.24	0.21**	0.10	0.00	0.01	-.00	.01
Day of Week Cosine Effects	Yes		Yes		Yes		Yes	
Autoregressive (1) Error structure	Yes		Yes		Yes		Yes	
Participant Random Intercept (Var)	60.02	17.98	0.10.32	0.034	0.16	0.05	.16	.05
Autoregressive parameter (rho)	0.30	0.05	0.48	0.045	0.38	0.05	.36	.02

*Note.* This model includes the effect of state anxiety on work goal progress within our autoregressive mixed model. Indirect effects reported in the results were calculated using a multilevel path analysis framework following (Preacher, Zhang, & Zyphur, 2011). N = 766.

\*\* =  $p < .01$  \* =  $p < .05$  <sup>†</sup> =  $p < .1$ . <sup>1</sup>

## Tests of Hypotheses

Results for Hypothesis 1 – 3 appear in Table 11. These proposed that between individuals average daily symptoms of anxiety and depression will increase post-IPV, but more so among those with closer psychosocial proximity to IPV. For anxiety, the interaction term between post-workplace IPV and psychosocial proximity is significant at  $p = 0.03$ , supporting our first prediction. For depression, the pattern is strong and in the correct direction. However, it is only significant at  $p = .08$ . The simple slope for the group with high psychosocial proximity was significant at  $p = .02$  for anxiety and non-significant at  $p = .14$  for depression. In both cases, the simple slope for those with low psychosocial proximity was non-significant. The two interactions are plotted in Figures 6 and 7. As expected, anxiety and depression increased, but only among employees with close psychosocial proximity to IPV.

These effect sizes were non-trivial. For anxiety, the participants with close psychosocial proximity to IPV showed a 10% increase in their average state anxiety symptoms after the event took place. Those with low proximity showed a 0.8% decrease in average anxiety. According to widely accepted cut-offs, someone who scores above a 40 on the STAI-Y (state) is exhibiting clinically significant levels of anxiety (Julian, 2011; Kvaal, Ulstein, Nordhus, & Engedal, 2005). Additionally, STAI scores are commonly classified as “no or low anxiety” (20–37), “moderate anxiety” (38–44), and “high anxiety” (45–80) (Jlala, French, Foxall, Hardman, & Bedford, 2010). As can be seen in Figure 6, our data indicate that among workers who had more proximity to the murder-suicide anxiety elevated beyond the clinical cut-off.

For depression, we see a 34% increase in average state depression symptoms among employees who had high psychosocial proximity to IPV after the event took place. In comparison, those with a low psychosocial proximity exhibited a 22% *decrease*. Though higher

after the event, the scores were not in the clinical range (Lovibond & Lovibond, 1995). As shown in Figure 7, individuals with high psychosocial proximity had higher scores *prior* to the event and this increased over time. A similar and somewhat stronger pattern was observed for anxiety (Figure 6).

Hypothesis 3 proposed that after an IPV event, progress toward work goals among those with high psychosocial proximity to the victim should decrease. This interaction was significant at  $p = .01$  and is presented in Figure 8. Only the simple slope for those with high psychosocial proximity was significant ( $p = .03$ ). Consistent with the findings for anxiety and depression, those with high psychosocial proximity exhibited a 7.5% decline, but those with low proximity actually showed a 3% increase in their work goal progress. Hypothesis 4 proposed that between individuals, the indirect effect of an IPV event on employees' progress towards work goals would be mediated by state anxiety for only those employees with close psychosocial proximity to the victim. The indirect effect of the murder-suicide was negative and significant only for those employees with high proximity (estimate = -0.033 95% BCCI = -0.07, -0.01). For employees without high proximity to workplace IPV, the indirect effect was not significant.

Thus far, we have treated trait anxiety and depression as control variables. In order to test Hypotheses 5-6, we incorporated them into our predictions, expecting that the aforementioned effects should be stronger for those high in trait anxiety (Hypothesis 5) and depression (Hypothesis 6). For Hypothesis 5, we predicted that within individuals, the indirect effect of IPV on employees' progress towards work goals would be mediated by state anxiety, but only for those with (a) high psychosocial proximity and (b) high trait anxiety. Table 12 reports the results of these analyses. For anxiety, the three-way interaction between time (days before and after the IPV), psychosocial proximity, and trait anxiety was significant,  $p = 0.01$ . As can be seen in

Figure 9, while participants scoring low on the BAI who had high proximity to IPV did show an increase in state symptoms of anxiety, the effect was smaller than those scoring high on the BAI. Furthermore, there was a significant main effect of predisposition towards clinical anxiety, such that those with high scores on the BAI reported greater state anxiety than those with a low BAI score regardless of proximity to IPV. Following Hayes (2018), the index of moderated moderated mediation was significant (estimate = -0.002 95% BCCI = -0.003, -0.001). The index of conditional moderated mediation by psychosocial proximity was likewise significant for individuals with high levels of trait anxiety (estimate = -0.04 95% BCCI = -0.07, -0.01) and non-significant for individuals with low levels of trait anxiety (estimate = 0.001 95% BCCI = -0.007, 0.009). Unlike Hypothesis 5, Hypothesis 6 was not supported. However, there was a significant main effect of trait depression on state depression. Thus, people with a predisposition reported more daily symptoms of depression. However, this did not interact with IPV and anxiety.

In the spirit of abductive research (Hollenbeck & Wright, 2017), we conducted a final, supplementary analysis examining whether the trends prior to the IPV event were significantly different from the trends after the event. The results of the discontinuous growth model are reported in Table 13. Figure 10 illustrates the plots of the discontinuous growth model for anxiety. The interaction between time, post IPV and trait anxiety is significant at  $p = .01$ . The only simple slope that is significant in this model is the slope for participants with high trait anxiety *after* the IPV took place ( $p < .01$ ). This aligns with our previous finding that for participants with high psychosocial proximity there was a significant difference in the trends of state anxiety for participants with high trait anxiety.

**Table 12***Results of the Test of Hypothesis 4*

Predictor	<u>Moderated Moderated Mediation</u>					
	M:			Y:		
	State Anxiety			Work Goal Progress		
			Coefficient	SE	Coefficient	SE
X: Time Before/After IPV (T)	<i>a</i> →	<i>a1</i> →	0.26*	0.12	<i>c'</i> →	0.002
W: Close Psychosocial Proximity (PP)		<i>a2</i> →	5.21	4.63		0.07
Z: Trait Anxiety (BAI)		<i>a3</i> →	1.04**	0.25		
XW: T x PP		<i>a4</i> →	-0.50 <sup>†</sup>	0.29		
XZ: T x BAI		<i>a5</i> →	-0.03	0.01		
WZ: PP x BAI		<i>a6</i> →	-0.47*	0.63		
XWZ: T x PP x BAI		<i>a7</i> →	0.09**	0.03		
U: State Depression			0.92**	0.08		
U: Day of Week Fixed Effects		Yes			Yes	
U: Trait Depression			-0.07	0.19		
M: State Anxiety					<i>b</i> →	-0.02**
						0.01

*Note.* Unstandardized coefficients are reported for each model specification. Time is in weeks. N = 766.

\*\* =  $p < .01$  \* =  $p < .05$  <sup>†</sup> =  $p < .1$

**Table 13***Results of the Test of Hypothesis 5*

Variable	State Anxiety	
	Coefficient	SE
X: Time Before/After IPV (T)	.29	.19
W: Post IPV	-.33	1.69
Z: Trait Anxiety (BAI)	.99**	0.26
XW: T x Post	-0.52 <sup>†</sup>	0.30
XZ: Post x BAI	0.01	0.17
WZ: T x BAI	-0.03	0.02
XWZ: T x Post x BAI	0.09**	0.03
U: State Depression	0.92**	0.08
U: Day of Week Fixed Effects	Yes	
U: Trait Depression	-0.05	0.19

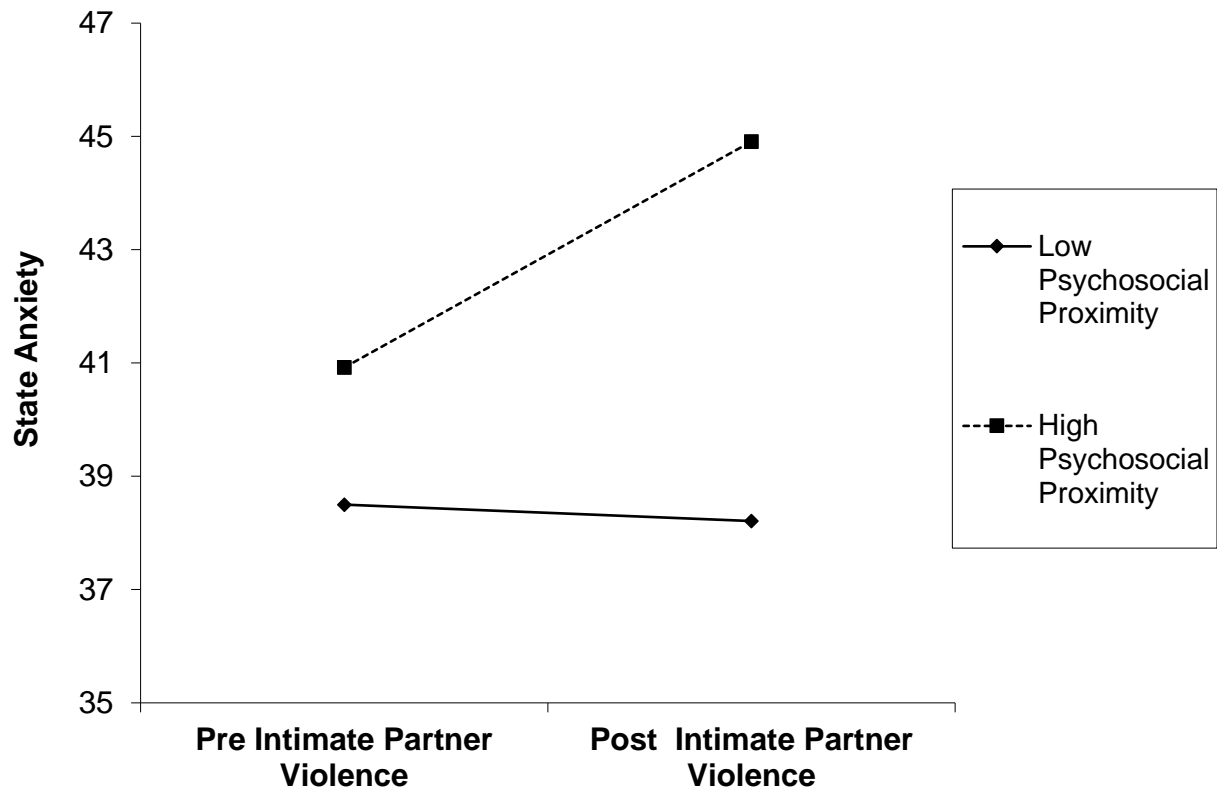
*Note.* Unstandardized coefficients are reported for each model specification. Time is in weeks. N = 766.

\*\* =  $p < .01$  \* =  $p < .05$  <sup>†</sup> =  $p < .1$ .



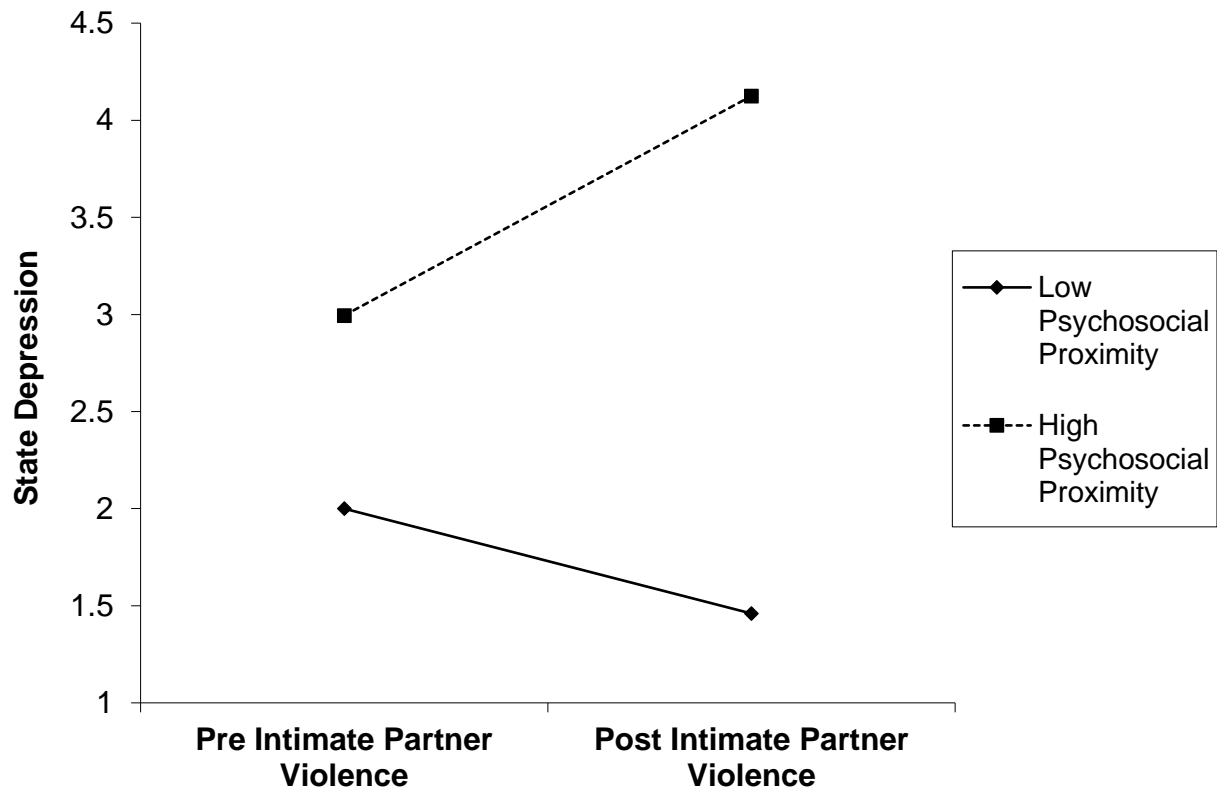
**Figure 7**

*Interaction Between Psychosocial Proximity and Pre/Post IPV on State Anxiety*



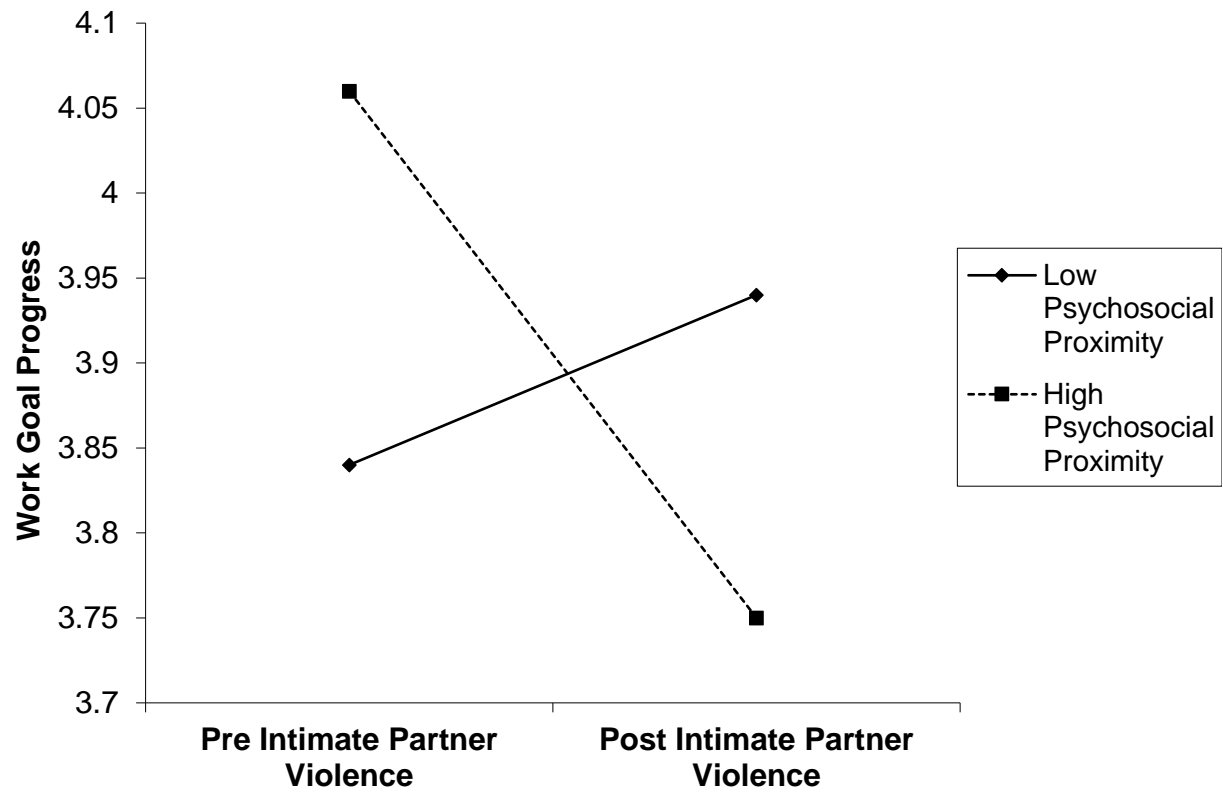
**Figure 8**

*Interaction Between Psychosocial Proximity and Pre/Post IPV on State Depression*



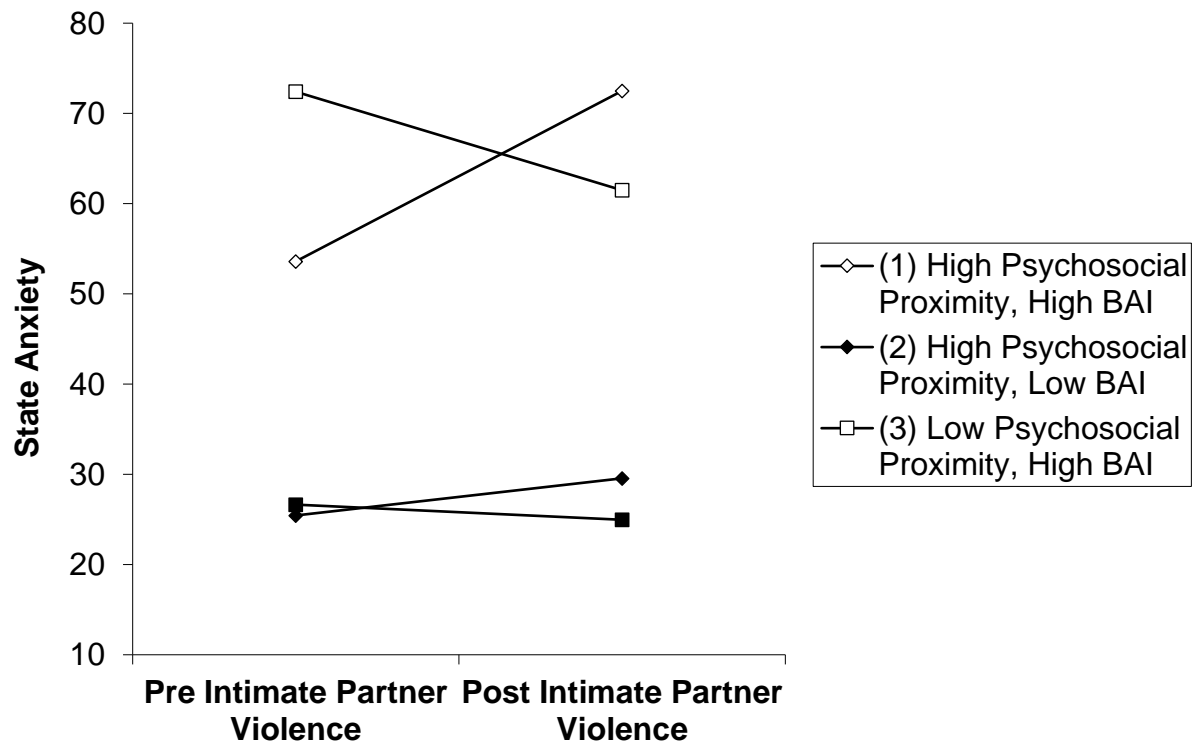
**Figure 9**

*Interaction Between Psychosocial Proximity and Pre/Post IPV on Work Goal Progress*



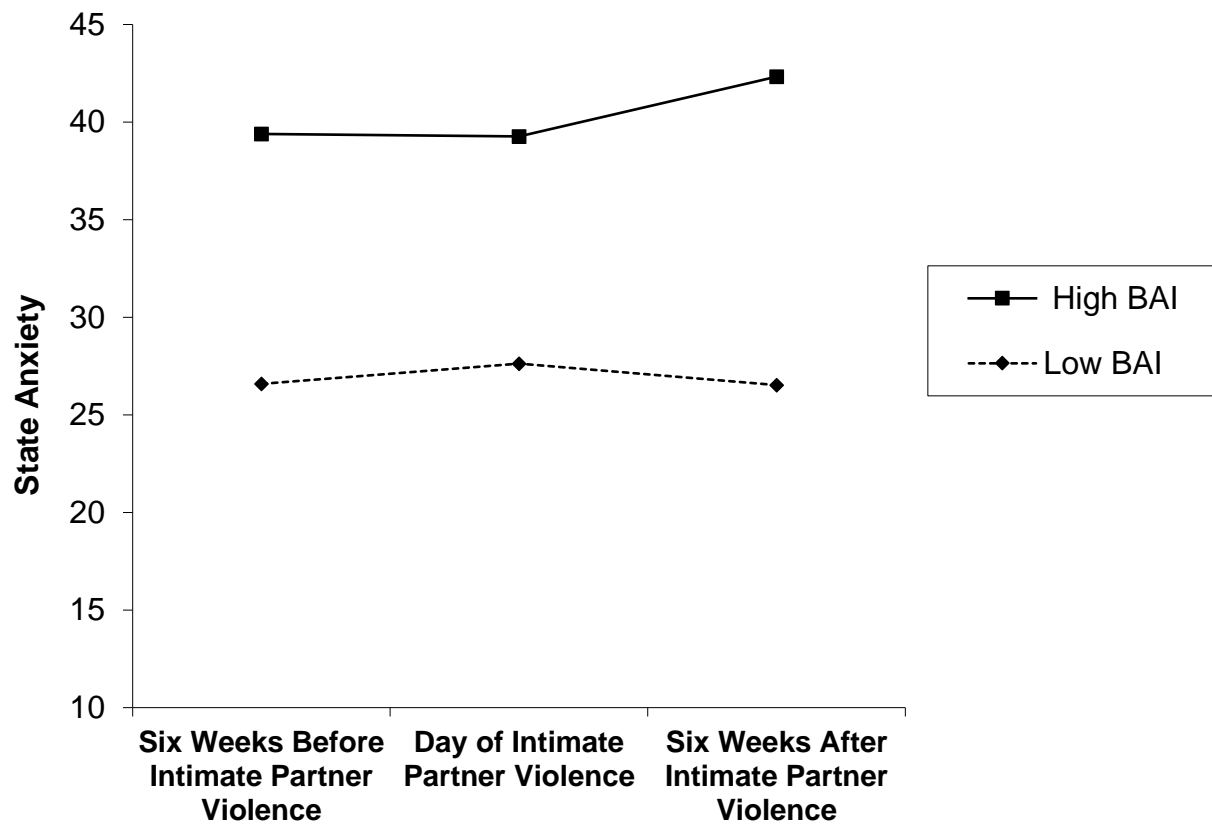
**Figure 10**

*Interaction Between Psychosocial Proximity, Time, and Trait Anxiety on State Anxiety*



**Figure 11**

*Discontinuous Growth Model for Participants with High and Low Levels of Trait Anxiety*



## Discussion

Intimate partner violence is a serious social problem, causing suffering for battered partners and their children. IPV's pernicious effects spill into organizations, causing economic losses due to diminished productivity, missed work, and medical costs (Duffy et al., 2004; Swanberg et al., 2005). Our study suggests that these losses could be underestimates, as the colleagues who worked in proximity to the victim of IPV exhibited heightened symptoms of clinical anxiety and depression, which negatively affected work goal progress (Hypotheses 1-4). These initial findings were obtained while controlling for trait symptoms of anxiety and depression. Following the guidance of our reviewers, an abductive approach (Hypotheses 5-6) allowed us to explore boundary conditions for these effects. One such condition is that individuals who exhibit higher trait anxiety and who were in greater proximity to the victim had a more severe reaction to the IPV event, such that their daily symptoms of state anxiety were also higher (Hypothesis 5). Similar results exploring depression were not significant (Hypothesis 6). It could be the case that our study concluded before symptoms of depression, marked by feelings like hopelessness, could emerge. While no single study can be definitive, our present investigation has at least two important strengths.

First, we captured an actual IPV event, as opposed to traditional retrospective self-reports, and did so with a longitudinal ESM study. Through our intensive longitudinal ESM design and multilevel time series techniques, we were able to capture the "in situ" experiences of employees who had endured a tragic event. Additionally, this method allowed us to compare participants' affective states both before and after exposure to IPV. Specifically, we were able to look beyond the mean group differences, at the individual slope shifts depicting how anxiety

unfolded within participants in real time. To our knowledge, this is one of the few studies available, in any discipline, which captures before and after data of an IPV among colleagues.

Second, we explored clinical anxiety and depression, important constructs that have only recently emerged in management and organization scholarship despite being incredibly costly (Follmer & Jones, 2018). We focused on anxiety and depression, as they have been found to be reactions to experienced violence (Fisher & Jacoby, 1992; Ryan & Poster, 1989) and likely affect the work itself (Quelch & Knoop, 2019). Our results indicate that many workers experience symptoms of anxiety and depression in the clinically significant range, and even suggest that anxiety and depression are not experienced in the same manner, despite being significantly correlated. They appear to have distinguishable theoretical profiles. For example, inspection of Figures 1-2 shows that some employees were exhibiting moderate to high levels of anxiety and depression even prior to the IPV event. After the event, these feelings become more severe. In the case of anxiety, they also impact goal progress. We hope this evidence urges organizations to prioritize supporting the mental health of their employees.

The conclusions for this study must be considered in light of a few limitations. Our results provide evidence that IPV negatively impacts mental health and work productivity. However, it is important for researchers to assess the generalizability of our findings. Our study was conducted in a single organization and within a single industry (health care). Future work should aim to replicate these findings, to the extent that is ethical, in other industries and organizations to further solidify external validity. Another concern is that our criterion measures were obtained via self-report. While other measures, perhaps clinical diagnoses or physical indicators, would have been informative, it does not appear that common method variance can fully account for our findings. This is because two key predictors, the IPV and psychosocial

proximity, were both defined objectively. Thus, we found that non-self-report antecedents were associated with self-reported criteria. We recommend that future researchers consider other potential predictors and consequences of IPV among employees and on the organization itself.

Given the serious and far-reaching ramifications of IPV, it is essential for organizations to understand how their employees and subsequent work are affected. The stress and strain put on employees impact mental health and can lead to diminished work effectiveness. We hope that this natural experiment will grant new insight into the ripple effect violent actions have on neighboring individuals as well as organizations.



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