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# An Experimental Study of Negative Performance Feedback: Consideration of a Cognitive Pathway and Individual Difference Factors

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An Experimental Study of Negative Performance Feedback: Consideration of a Cognitive  
Pathway and Individual Difference Factors

by

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A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
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## **Abstract**

Negative performance feedback is relatively common and may be related to negative mental health outcomes, but there is a lack of sufficient experimental research. Further, little is known about the pathway by which effects emerge, or factors that may enhance or attenuate resilience to the effects of negative performance feedback. There is preliminary support for a cognitive pathway through appraisals of falling short of standards, but this specific model remains untested. Likewise, research suggests that perfectionism and positive future thinking may affect resilience in the context of negative performance feedback. The present study was among the first to experimentally test this integrated model. A total of 347 participants were randomly assigned to positive, negative, or neutral performance feedback and reported on perfectionism, positive future thinking, appraisals of falling short of standards, and demoralization. The model was partially supported; negative performance feedback contributed to greater demoralization through the hypothesized pathway of appraisals of falling short of standards. Socially prescribed perfectionism and positive future thinking did not moderate these relationships, but socially prescribed perfectionism did increase risk for appraisals of falling short of standards across feedback conditions. Exploratory analyses indicated that self-oriented perfectionism may increase vulnerability for appraisals of falling short of standards in the context of negative performance feedback. These results suggest compelling directions for future research and begin to clarify trajectories of vulnerability and resilience in the face of negative performance feedback.



## **Introduction**

Negative life events are broadly defined as significant, undesirable life occurrences which necessitate some degree of adjustment, change, or response on the part of the individual (Dohrenwend, 1973; Holmes & Rahe, 1967; Sarason et al., 1978). At times, these events may pose a threat to life, health, needs, or desires (Wolff, 1953). Negative life events are an unavoidable part of life; such events frequently occur, and most individuals will experience one or more negative life events throughout their lives (G. A. Bonanno, 2004; G. A. Bonanno & Mancini, 2008; Linden, 1984; Ogle et al., 2013). Indeed, it has been argued that “no one is immune to their occurrence,” (Tait & Silver, 1989, p. 351), and that negative life events “are omnipresent, and... constitute a large portion of the stress to which man is exposed” (Wolff, 1953, p. 315). As implied by their name, negative life events are inherently aversive and, perhaps unsurprisingly, may affect physical, mental, and emotional health.

In addition to being a highly prevalent and somewhat inevitable part of life, negative life events are associated with myriad concerning outcomes. Regarding physical health, the occurrence and number of negative life events are related to general physical illness (Cohen et al., 1993; Holmes & Rahe, 1967; Rahe, 1972), chronic illness (Wyler et al., 1971), functional impairment (Lantz et al., 2005), hypertension (Jemmott & Locke, 1984), myocardial infarction and heart disease (Rafanelli et al., 2005; Theorell & Rahe, 1971), multiple sclerosis (Antonovsky & Kats, 1967), cancer (Holmes & Masuda, 1974), sudden cardiac death (Jemmott & Locke, 1984; Rahe & Lind, 1971), and general mortality (Lantz et al., 2005). Regarding mental and emotional health, the occurrence and number of negative life events are associated with general

psychiatric impairment (X. Liu & Tein, 2005; Myers et al., 1971), distress (Gray et al., 2004; Tein et al., 2000), demoralization (Lennon et al., 1990), hopelessness (Dean et al., 1996; Fekete et al., 2004), onset and severity of schizophrenia symptoms (Birley & Brown, 1970; G. W. Brown & Birley, 1968), substance misuse (Covault et al., 2007), posttraumatic stress disorder (PTSD; Gray et al., 2004), anxiety (Anyan et al., 2017; Verbeek et al., 2019; Vinokur & Selzer, 1975; Zou et al., 2018), and depression (Anyan et al., 2017; Dalgard et al., 1995; Dean et al., 1996; Fekete et al., 2004; Paykel et al., 1969; Shrout et al., 1989; Turner et al., 1995; Vinokur & Selzer, 1975; Visser et al., 2013; Zou et al., 2018), among other outcomes. A substantial body of literature (for review, see Liu & Miller, 2014) supports a relationship between the occurrence and number of negative life events and suicidality (Joiner & Rudd, 2000; Madge et al., 2011; O'Connor et al., 2010; Vinokur & Selzer, 1975), including suicidal ideation (J. Chen et al., 2017; Dean et al., 1996; Rew et al., 2016; Rowe et al., 2013), suicide planning (Borges et al., 2008; McKeown et al., 1998), suicidal intent (Kumar et al., 2006; Power et al., 1985), and fatal and nonfatal suicide attempts (Altindag et al., 2005; T. Chen & Roberts, 2019; Fjeldsted et al., 2017; Hirsch et al., 2019; Khan et al., 2008; B.-P. Liu et al., 2019; X. Liu & Tein, 2005; Y. Liu & Zhang, 2018; Luo et al., 2016; R. C. O'Connor et al., 2012; Rowe et al., 2013; Zhang et al., 2010). This does not appear to reflect general psychopathology, as studies controlling for such confounds continue to find a significant relationship between occurrence and number of negative life events and suicide attempts (Arie et al., 2008; Azorin et al., 2009; De Wilde et al., 1992; Rohde et al., 1997). Longitudinal research supports the directional effects of the occurrence and number of negative life events on general psychiatric impairment (Myers et al., 1972), distress (Park et al., 2018), anxiety (Evans et al., 1987; R. C. O'Connor et al., 2010), and depression (Flett et al., 1995; R. C. O'Connor et al., 2010). Similarly, occurrence and number of negative

life events have been found to predict future suicidal thoughts and behaviors (Bagge et al., 2013; Brent et al., 1990; Harder et al., 1980; Özer et al., 2002), even when controlling for related risk factors, such as psychopathology (Yen et al., 2005). In attempts to clarify causality, experimental studies have manipulated laboratory stressors as proxies for negative life events, finding expected effects on negative affect, including anxiety, dysphoria, hostility, disappointment, and depression (e.g., Alloy & Clements, 1992; Besser et al., 2004, 2008; Houston, 1995; Owens et al., 2018; Zautra et al., 2000). While it is clear that negative life events may exacerbate risk for various maladaptive outcomes, less is known about factors that may affect or explain these relationships.

Despite burgeoning research on the pernicious nature of negative life events, little is known about the factors influencing their consequences. For example, the qualities of a negative life event may affect how it is experienced; that is, certain “types” of negative life events may tend to relate to certain outcomes but not others. The expected outcome of a given negative life event then may depend on qualities of the life event itself. Alongside this gap in knowledge, the pathways by which negative life events, broadly or specifically, relate to their concerning outcomes remain unclear. Given that life events are not always preventable, and are a somewhat inevitable occurrence throughout life, there is a substantial need to better understand, identify, and intervene upon intermediate mechanisms which may be more preventable or mutable. Finally, given the pervasive nature of negative life events, it is necessary to better understand individual differences in responses to these events. It is clear that not every individual who experiences even the same negative life event responds in the same way (Galatzer-Levy et al., 2018; Rutter, 2006b, 2006a); to this end, it may be possible to identify and develop factors associated with more resilient responding. Accordingly, the present research seeks to address

these questions by considering the nature of negative life events, testing a pathway of risk, and proposing constructs which may be particularly pertinent to resilience.

## **Chapter 1: Literature Review**

### **Theoretical Conceptualizations and Definitions of Negative Life Events**

Negative life events are “environmental incidents” (A. Meyer, 1951, p. 53), which beget stress or change, or otherwise confer some negative impact upon the individual (Holmes & Rahe, 1967). There appear to be two primary criteria which characterize a negative life event (Dohrenwend, 1973). First, it must be an aversive and undesirable event which negatively impacts the individual (Birley & Brown, 1970; G. W. Brown & Birley, 1968; Myers et al., 1972; Paykel, 1974; Sarason et al., 1978). Next, and less immediately evident, it must necessitate or imply — at least to some degree — change in adjustment, functioning, status, or environment (Froberg et al., 1970; Holmes & Rahe, 1967; Myers et al., 1972; Vinokur & Selzer, 1975). As this theorizing has advanced, it has become increasingly clear that these domains may depend on the meaning of the event for the individual (Dohrenwend, 2006; Hammen, 2005; Monroe, 2008). These conceptual considerations have emerged from decades of theoretical and empirical research on negative life events.

#### ***Early Conceptualizations***

Even before negative life events were labeled as such, it was apparent that there was a class of events which might be identified by their concerning impacts, particularly on affective states. For instance, Tuke (1884) argued that life events which bring about strong emotions, whether positive or negative, may influence physical health and well-being; so too did Cannon (1915), who studied physiological stress responses to “natural events in the course of an animal’s

life” (1914, p. 357). Early research on negative life events was primarily concerned with events with more universal impact, such as natural disasters or catastrophes. As early as 1907, the aversive nature of negative life events was noted by a physician, quoted by Murri (1912) as noting severe, acute stress responses among individuals exposed to an earthquake. Likewise, Lindemann (1944) noted a similar response in those who survived, or lost someone to, a building fire in Boston. Fritz and Mark (1954) found that ninety percent of those exposed to a severe tornado reported physical and emotional distress. Similarly, in interviewing a systematic sample of adults after the assassination of President Kennedy, Sheatsley and Feldman (1964) found that eighty-nine percent reported symptoms of mental health difficulties. Thus, the first known research on negative life events tended to consider public emergencies and disasters. While valuable in documenting patterns of aversive consequences of these events, this initial research left much to be understood regarding the characteristics that defined negative life events, particularly those events which are experienced privately by the individual.

### ***Primary Domains Defining Negative Life Events***

More recently, researchers have attempted to define those domains which characterize negative life events experienced privately by the individual. Rabkin and Struening (1976) proposed that negative life events varied in their *magnitude* — degree of change; *intensity* —rate of change; *duration* — length of change; *unpredictability* — one’s ability to prepare; and *novelty* — one’s relevant prior experience. Similarly, Dohrenwend (2006) proposed six relevant domains, including *valence*, *source*, *unpredictability*, *centrality*, *magnitude*, and *potential to exhaust the individual physically*. Here, *valence* refers to the degree to which a negative life event is undesirable, aversive, or negative, rather than positive. *Source* refers to the causes of the negative life event, whether internal or external. *Unpredictability* refers to the degree to which a

negative life event might have been anticipated, expected, or prepared for. *Centrality* refers to the importance and urgency of the negative life event — for instance, whether the negative life event poses a threat to life or simply to attainment of certain goals. *Magnitude* refers to the amount of change or adjustment expected to result from this event. Finally, as suggested, *potential to exhaust the individual physically* refers to the physical toll a life event may be expected to take upon the individual. However, it is of note that these domains are not necessarily theorized to be orthogonal; indeed, Dohrenwend (2006) proposed that the other domains (e.g., unpredictability, centrality, potential to physically exhaust the individual) likely contributed to the domain of magnitude. To this end, negative life events which are, say, more central to the individual will likely also necessitate greater change and adjustment. Likewise, Rabkin and Struening (1976) argued that magnitude was among the most influential of these domains. Consistent with these proposals, preceding and subsequent theorizing on negative life events has overwhelmingly supported the specific role for two domains — valence and magnitude.

Initial researchers primarily defined negative life events by their *valence* — specifically, their negative nature (Dohrenwend, 1973; Dohrenwend, 2000). That is, negative life events were those occurrences which were undesirable and distressing (e.g., G. W. Brown & Birley, 1968; Paykel et al., 1971; Paykel, 1974). Among the earliest conceptualizations of personal negative life events was that from Wolff (1953), who described negative life events as indicators of actual or perceived threat, similar to Dohrenwend's centrality (2006). He believed these events could jeopardize an individual's social ties, health, well-being, and ability to realize aspirations and achieve full potential. This closely mirrored the later conceptualization by Brown (1974), who defined negative life events as indicators of threat and, earlier, as undesirable and stressful

occurrences (G. W. Brown & Birley, 1968). Subsequent researchers likewise defined negative life events by their distressing nature (e.g., Paykel, 1974; Paykel et al., 1971). That negative life events are defined by their valence continues to be represented in present theorizing (e.g., Seery & Quinton, 2016). However, the work of Wolff begins to suggest the second primary dimension of negative life events — that of magnitude. That is, not only might negative life events be defined by their stressful nature, but they might also be defined by their disruptive impact on intra- and interpersonal functioning.

As the literature on negative life events advanced, researchers began to propose that these events were defined not only by their associated distress, but also by their *magnitude* of required change and adjustment in usual activities, functioning, roles, status, and environment (Dohrenwend, 1973; Holmes & Rahe, 1967). Meyer (1951) was foundational in developing this perspective; he constructed “life charts” which he used to illustrate the interplay of biological, psychological, and social influences on patients’ health (Lief, 1948; A. Meyer & Lief, 1948). Within this conceptualization, he specifically considered the important role of life events necessitating change, such as graduations, births, deaths, and others. In his studies on stress, Selye (1956) similarly argued this position; namely, he viewed stressors as life changes, and as inherently interacting with, or requiring a response from, the individual. This theorizing was hugely influential in the work of Holmes and Rahe (1967), as they developed one of the first empirical list of negative life events. Similar to Meyer, they considered negative life events to be defined by adjustment and change, with adjustment reflecting “the amount and duration of change in one’s accustomed pattern of life resulting from various life events... [or] the intensity and length of time necessary to accommodate to a life event” (Holmes & Rahe, 1967, p. 213). Subsequent researchers similarly defined negative life events as those occurrences which



demand some response or change on the part of the individual (Dohrenwend, 2006; Dohrenwend & Dohrenwend, 1969; Froberg et al., 1970; Linden, 1984; Sameroff, 2010). Of note, Holmes and Rahe maintained that valence and magnitude were separable domains; that is, positive life events (e.g., marriage) could also necessitate a great deal of adjustment (1967). While there is some evidence to suggest that the two dimensions are related (i.e., events which are more distressing also tend to require more change; Paykel et al., 1971), other research nonetheless supports Holmes and Rahe's postulation that the two represent discriminable properties (Tennant & Andrews, 1976). Accordingly, an event is classified as a negative life event if it is both negative and disruptive.

### ***Consideration of Context and Meaning***

An important development in the conceptualization of negative life events has been the consideration of contextual threat, proposed by Brown and Harris (1978). Indeed, this has come to be considered the "gold standard" approach to conceptualizing negative life events (Dohrenwend, 2006; Hammen, 2005; Monroe, 2008). Put simply, contextual threat considers the impact and meaning of the event for the individual; in other words, contextual threat considers how the individual's appraisals of the event (e.g., with regard to valence, magnitude, and other domains) affect the event's consequences. Rabkin and Struening (1976, p. 1018) similarly proposed that "a critical factor in evaluating the impact of stressful events is the individual's perception of them." The need to address context and meaning is highlighted in Dohrenwend's (2006) review of the literature. He notes that there is substantial variability in individuals' understandings of negative life events, even for the same given event. For example, reports of *deaths of close friends* for some may refer to "deaths of long absent, childhood friends to whom the respondents were no longer close" (Dohrenwend, 2006, p. 4). Likewise, being *laid off* may

vary substantially in impact depending on whether the layoff was expected or unexpected (e.g., the expected ending of a contractual engagement versus a random firing), due to internal or external causes, or even of great importance to the individual (e.g., whether the job was a hobby versus a long-held career central to the individual's identity). Thus, it is integral to clarify what the negative life event meant for the individual, in order to accurately determine its impact.

In summary, then, the literature suggests that negative life events refer to those events that are negatively valenced (e.g., aversive, undesirable) *and* which require a degree of adjustment, change, or response. Importantly, these domains cannot be assumed to be inherent to any given life event. Individuals may vary in their appraisals of valence, magnitude, and other domains, depending on individual differences in meaning and context of the life event. These individual differences, in turn, are likely to affect the consequences of negative life events.

### **Theories of Consequences of Negative Life Events**

Alongside attempts to define negative life events, researchers have simultaneously attempted to theorize how negative life events come to be destructive; as reviewed, negative life events are associated with myriad maladaptive outcomes ranging from physical illness (Cohen et al., 1993), to depression (Anyan et al., 2017), to suicide (B.-P. Liu et al., 2019), among others. Perhaps most simply, these events may be maladaptive because they are inherently stressful (e.g., G. W. Brown, 1974; Linden, 1984; McGrath, 1970; Paykel, 1974; Rahe & Arthur, 1968; Sarason et al., 1978), and excessive or chronic stress, in general, is associated with poorer physical and psychological outcomes (Cooper & Quick, 2017; Schneiderman et al., 2005). However, more specifically, negative life events may be maladaptive because they require emotional, cognitive, and behavioral responses.

As suggested in various conceptualizations of negative life events, one of their defining features may be the magnitude of adjustment, change, or response they require (e.g., Holmes & Rahe, 1967; Myers et al., 1972). To this end, a negative life event, such as losing a job, may be stressful in its own right. However, this event may catalyze downstream cognitive, affective, and behavioral responses (Baum, 1990; Cohen et al., 2019; S. E. Taylor, 1991), which contribute additional stress and distress. That is, *thinking* or ruminating about having lost one's source of income may be stressful (Beck, 1964; Connolly & Alloy, 2017; Rose et al., 2017; Zhou & Wu, 2016), as may *feeling* aversive emotions such as shame, disappointment, embarrassment, or uncertainty (Gross & Feldman Barrett, 2011; S. Kim et al., 2011; Linehan, 1993; Linehan et al., 2007). These states may trigger subsequent *behavioral* reactions, such as searching for new employment, developing additional skills, finding ways to save money, requesting financial support from friends and family, or other such behaviors, which in turn may generate additional stress and demands (Cohen et al., 2019).

### ***Behavioral Pathways***

Behavioral responses likely play a complex role in the relationship of negative life events with various maladaptive outcomes. For starters, events ranging from divorce to jail terms to failing a course to fighting with a friend often require behavioral responding; if these behaviors tend to be less effective strategies, such as avoidance (for instance through procrastination, suppression, isolation/withdrawal, substance use, or other responses; Aldao et al., 2010; S. C. Hayes et al., 2004; McAndrew et al., 2017; Rodino et al., 2018; White Hughto et al., 2017), these behaviors may mediate the destructive effects of negative life events. Indeed, there is some empirical support for a relationship between negative life events and poorer problem solving (Nezu & Ronan, 1985; Solomon et al., 1988) and coping skills (Barrera et al., 2016; Merluzzi et

al., 2019; Repetti et al., 2002; Sanford et al., 2017; Yaacob et al., 2019), which in turn are associated with greater psychopathology (Aldao et al., 2010). Less clear, however, is the role that adaptive responses might play, especially considering that these may be the most common responses to negative life events (Billings & Moos, 1981; Cohen et al., 2016). On the one hand, adaptive behaviors — such as eliciting social support, attending couples counseling, spending more time studying, improving health behaviors, and others — may generate additional stress and deplete physical, emotional, and cognitive resources (e.g., Cohen et al., 2019; Hagger et al., 2010; Lin et al., 2020). On the other hand, such adaptive behavioral responding might be expected to mitigate rather than mediate the pernicious effects of negative life events (Aldao et al., 2010). That is, problem solving efforts may actually relieve stress, anxiety, and distress (e.g., Billings & Moos, 1981; Kleiman et al., 2014). For instance, such behaviors may reduce discrepancies between actual and ideal circumstances produced by negative life events (Higgins, 1987; Pierce et al., 1999), in turn improving mental health outcomes (Mason et al., 2019). Thus, negative life events might catalyze both ineffective and effective behavioral responding, which in turn may generate additional stress beyond that generated by the negative life event alone. However, adaptive behavioral responding may also be protective against the effects of negative life events. Accordingly, the tenability of behavioral mediation may depend on whether the negative life event leads primarily to maladaptive or adaptive behavioral strategies. Importantly, while behavioral responses may have implications for downstream emotional and cognitive processes (e.g., secondary appraisals; Folkman & Lazarus, 1984; Lazarus, 1998; Lazarus & Folkman, 1984), the reverse may also be true. That is, an individual's behavioral responding may first depend on the affective and cognitive sequelae of the event, consistent with the Meta-Model of Stress (Fletcher & Fletcher, 2005).

### *Emotional Pathways*

The Meta-Model of Stress (Fletcher & Fletcher, 2005) posits that the transaction between person and environmental stressors operates first through perceptions, appraisals, and affective states, before leading to behavioral responses; behavioral responses may in turn predict outcomes and consequences, such as distress or well-being. Further, individual difference factors may operate on various points along this pathway. Alongside this model of stress, other theoretical work also supports the possibility of affective mechanisms. That is, negative life events may lead to maladaptive outcomes, such as poor physical health or distress, in part through a pathway of emotional responses. For instance, various conceptualizations of affective processes propose that emotions can and do beget other emotions (Gross & Feldman Barrett, 2011; Linehan, 1993; Linehan et al., 2007; Selby & Joiner, 2009). Indeed, this is the primary thesis of the Emotional Cascade model (Linehan, 1993; Selby & Joiner, 2009), which proposes a positive feedback loop wherein negative affect begets additional, and greater, negative affect via rumination on the initial emotional state and more dysregulated emotional responses. Empirical work supports the proposed role of rumination (Genet & Siemer, 2012; Selby et al., 2016; Selby & Joiner, 2009; Slabbert et al., 2018; for review, see Thomsen, 2006) and emotions (Bailen et al., 2018; Beer & Moneta, 2012; Jäger & Bartsch, 2006; Mitmansgruber et al., 2009; Moberly & Watkins, 2008) in this positive feedback loop. Likewise, there is ample empirical support for an effect of negative life events on various emotional states (e.g., Congard et al., 2011; Genet & Siemer, 2012; Powers et al., 2007; Prizmić-Larsen et al., 2019; Seta et al., 2008). Thus, negative life events may lead to aversive outcomes in part through a positive feedback loop of emotional responses. However, in considering this and other theoretical and empirical work (e.g., Beck, 1964; Cohen et al., 2016, 2019; Fabes & Eisenberg, 1997; Folkman & Lazarus, 1984; Lazarus, 1991, 1999b, 1999c), it

seems unlikely that emotions operate alone in this pathway; instead, it may be more likely that cognitive and emotional processes transact in bringing about consequences of negative life events.

### ***Cognitive Pathways***

There is substantial support for the proposed role of cognitive responses mediating the maladaptive effects of negative life events. Beyond simply leading to rumination (Boyes et al., 2016; Li et al., 2019; Lyu et al., 2017), negative life events may also substantially influence beliefs and appraisals. Specifically, Park et al. (C. L. Park, 2010; C. L. Park et al., 2012; C. L. Park & Folkman, 1997) propose that negative life events lead to *situational* appraisals, which may affect *global* beliefs. Whereas the former refer to appraisals about a specific person-environment interaction, the latter refer to broader, more enduring beliefs. These beliefs may relate to one's views of the world (e.g., "the world is safe and predictable") or views of the self (e.g., "I am in control," "I am special;" C. L. Park et al., 2012; C. L. Park & Folkman, 1997). When situational appraisals are discrepant from, or incompatible with, global beliefs (C. L. Park, 2010; C. L. Park & Folkman, 1997), individuals may experience considerable distress (Koss & Figueredo, 2004; C. L. Park et al., 2012; Plaks et al., 2005). Individuals may attempt to resolve this aversive discrepancy and subsequent distress through meaning making (Frankl, 2006; Proulx & Heine, 2010), which may occur in part through accommodation or assimilation (Janoff-Bulman, 1992; Joseph & Linley, 2005; Parkes, 2001; Proulx & Heine, 2010; Resick & Schnicke, 1993). Regarding the former, negative — and especially traumatic — life events may result in accommodation, or the process whereby new, incompatible information (e.g., situational appraisal) requires change in existing global beliefs (Foa & Rothbaum, 1998; Janoff-Bulman, 1989; Resick & Schnicke, 1993). Consider an individual with an assumption of

meaningfulness/controllability (Epstein, 1991), or the belief that behaviors determine outcome. If this individual is assaulted, she might adjust her beliefs to account for the possibility that some experiences are beyond individual control (i.e., accommodation; Janoff-Bulman, 1989).

Alternatively, such traumatic life events may result in assimilation, or the process whereby new information is integrated into existing schemata and beliefs (Foa & Rothbaum, 1998; Janoff-Bulman, 1989; Resick & Schnicke, 1993); indeed, assimilation may be the more common response, as it requires less time and cognitive effort (Proulx & Heine, 2010). Instead of adjusting her beliefs about worldview, the woman who was assaulted may instead assume that she did not enact the appropriate behaviors to prevent this assault (i.e., assimilation; Janoff-Bulman, 1989). There is evidence to support the effect of negative life events on views of both the world and the self via these mechanisms.

Considerable theoretical and empirical research supports that negative life events, particularly traumatic events, may result in changes in worldview (Janoff-Bulman, 1992; Kauffman, 2013). For instance, through accommodation, individuals may change beliefs regarding *benevolence*, or the belief that the world is safe and people are trustworthy, and *meaningfulness*, or the belief that good and bad outcomes are controllable or deserved (Epstein, 1991; Janoff-Bulman, 1992). More broadly, these negative life events may shatter beliefs of the world as just and predictable (Janoff-Bulman, 1989, 1992; Janoff-Bulman & Frieze, 1983; Park & Folkman, 1997; Schwartzberg & Janoff-Bulman, 1991). Individuals may begin to feel helpless, and as though they have little control over outcomes (Windsor et al., 2008). Empirical research supports these theorized effects of negative life events on global beliefs about worldview (Anders et al., 2014; Bramsen et al., 2002; Currier et al., 2009; Gutierrez & Park, 2015; Harter & Vanecek, 2000; Mancini et al., 2011; Ornduff, 2000; C. L. Park et al., 2012;

Poulin & Silver, 2019; Prager & Solomon, 1995; Schuler & Boals, 2016; Solomon et al., 1997; Tian, 2019; Tomich & Helgeson, 2002), with subsequent effect on quality of life, psychiatric symptoms, general functioning, symptom distress, and other outcomes. Interestingly, there is some evidence to suggest a reciprocal relationship, such that preexisting worldviews may also influence how negative life events are appraised and experienced (Mancini et al., 2011; E. M. Peters et al., 2004). Alternatively, views of the world may remain unchanged and individuals may instead perceive that the negative life event reflects some individual failing or personal shortcoming.

Research also suggests that negative life events can catalyze changes in beliefs about the self. That is, individuals may view the negative life event not as an indicator that the world is uncontrollable or unjust, but instead as an indicator that they themselves did not do enough to ensure safety or success. To this end, negative life events might violate global beliefs of the self as invulnerable or special (Janoff-Bulman & Frieze, 1983). Individuals may blame themselves for the experience of negative life events, with this self-blame associated with greater distress (Garnefski et al., 2001; Janoff-Bulman, 1989; Koss & Figueredo, 2004). Additionally, it has been theorized that negative life events may threaten global perceptions of social status and identity, such that affected individuals may perceive a loss of status in their own or others' eyes (e.g., Myers et al., 1972). This may be particularly likely when negative life events generate situational appraisals of falling short of standards, given the relationship of such appraisals (Bender, 2020) and perfectionism broadly (Bender, 2020; Wetherall et al., 2018; Wyatt & Gilbert, 1998) with social status variables. As with the research on worldview, empirical findings support an effect of negative life events on views about the self and self-worth (Galambos et al., 2006; Gao et al., 2019; S. Hall et al., 2003; Joiner et al., 1999; Judge, 1997; Ku, 2017; Ma &



Wang, 2018; Orth & Luciano, 2015; Pettit & Joiner, 2001; Pincus, 2013; Tetzner et al., 2016; Zuo et al., 2020). Thus, cognitive mechanisms appear to have considerable theoretical and empirical support.

In summary, there have been several proposed mechanisms of the pathway from negative life events to maladaptive outcomes. Most simply, negative life events may lead to outcomes such as distress, psychopathology, and suicide because they are inherently stressful. Alternatively, or additionally, this pathway may operate through subsequent behavioral, emotional, and cognitive responses. There is some support for the role of negative life events in catalyzing ineffective coping and problem solving responses, which might be expected to mediate the effects of these events on physical and mental health outcomes. However, it seems that negative life events are more likely to catalyze active coping responses; while these may generate additional stress and deplete resources, they may alternatively be protective against negative life events. Accordingly, the tenability of behavioral mediation may require additional research. In contrast, there appears to be considerable support for the effect of negative life events on affective responses, which in turn may serve as mechanisms in the pathway to maladaptive outcomes. Of note, the literature suggests that such emotional processes are not independent of perceptions and appraisals. Therefore, cognitive consequences of negative life events may be an integral intermediate step in this pathway, a postulation for which there exists considerable theoretical and empirical support. In particular, negative life events may lead to maladaptive outcomes through effects on views of the world and oneself. Given the diversity in both negative life events and the reviewed pathways, the mechanism by which a negative life event comes to be destructive may depend on the nature of the life event itself.

## **Considering Unique Effects of Specific Negative Life Events**

In reviewing theories of consequences of negative life events, it becomes apparent that the pathway through which a given life event yields maladaptive outcomes may depend in large part on the qualities of the life event itself. That is, whether a negative life event leads to consequences such as distress or suicidality through ineffective behavioral responding, versus beliefs about benevolence, versus appraisals of having fallen short of standards, versus other mechanisms — or some combination therein — may vary as a function of the nature of the negative life event. While researchers have attempted to group like events, these efforts have proven to be somewhat inconsistent.

There exists some literature attempting to classify negative life events into defined categories, but this work remains highly variable across studies. Among the earliest researchers to make these efforts, Holmes and Rahe referred to negative life events as occurrences which have some implication for “family constellation, marriage, occupation, economics, residence, group and peer relationships, education, religion, recreation, and health,” among other domains (1967, p. 216). Likewise, Myers et al. described negative life events related to education, relocation, marriage, family, interpersonal, health, work, finance, legal, and community crises (1972). More recently, Smyth et al. (2008, p. 71) classified negative life events into categories corresponding to “death, divorce, sexual, violence, academic, and other.” In contrast, Poulin and Silver (2019, pp. 4–5) classified negative life events by the categories of “injury or illness, violence, bereavement, social-environmental stressors, relationship-focused events, and community disasters.” In their systematic review, Liu and Miller (2014) divided negative life events into broad categories (e.g., interpersonal, health, financial, etc.) and then subcategories within these broader domains (e.g., within interpersonal — conflict with family, conflict with

peers, etc.). While some researchers have developed extensive classification systems, with numerous, highly specific categories (e.g., Dalgard et al., 2006; Kraaij et al., 2002), others have developed classification systems with very few, broad categories of events (e.g., relationship events, illness events, network events, and external events; Sandanger et al., 2004). Still others first classify events by whether they occurred directly to the individuals (“personal”) or simply to someone they know (“network”), before classifying the event into additional subcategories (Kendler et al., 2001). In addition to the heterogeneous nature of these attempts, other limitations exist.

These efforts are informative, in that they begin to classify negative life events by the different domains upon which they may have an impact; however, it is not necessarily clear that this is a useful classification heuristic, nor that such domains can even be conceptualized orthogonally. For example, events which affect health are also likely to affect work, finance, and relationships, and so on. Indeed, it is hard to imagine a negative life event which doesn’t have some degree of interpersonal implication, a confound likewise noted by Rutter (1985a) and supported empirically (Schulz & Tompkins, 1990). Further, these categories are somewhat overgeneral, and life events therein tend to be characterized by a high degree of heterogeneity (even in classification systems with highly specific categories; Dohrenwend, 2006). In addition to these limitations, it is unclear how these classification systems are theoretically or statistically developed. Accordingly, this work remains underdeveloped, and additional research may be needed to clarify the utility and accuracy of these broad classification attempts, particularly in predicting mechanisms and consequences of negative life events. As concluded by Liu and Miller (2014, p. 189) “more research is required identifying the types of stressors most likely to precipitate suicidal ideation and behavior.”

Given the nascent and inconsistent nature of this research on categorizing negative life events, it is not surprising that there is little empirical work on specific pathways corresponding to certain negative life events. Nonetheless, there is some evidence to suggest different pathways for events which are primarily interpersonal relative to performance-related (Besser & Priel, 2011); whereas the former may operate through a pathway of appraising the event as affecting the individual's interpersonal relatedness and self-worth, the latter may operate through a pathway of appraising the event as affecting the individual's self-definition (e.g., a positive, integrated identity). Further, Blatt and Zuroff (1992) proposed a Personality-Event Congruence model, whereby personality interacts with type of negative life event to predict pathways and consequences. Specifically, individuals are vulnerable to those negative life events which are incongruent with their personality (e.g., individuals high in self-criticism are particularly vulnerable to events which are related to performance and achievement; Blatt & Zuroff, 1992). Thus, there exists some support for the postulation that different life events may operate through different pathways, at least with regards to appraisals.

That certain types of negative life events — or negative life events of a certain nature — may have similar mechanisms is a compelling possibility. That is, if negative life events have differential, and perhaps even predictable, pathways to their consequences, it may be possible to anticipate this pathway and implement intervention efforts accordingly. This may be particularly compelling for those events which are both especially pernicious and especially common. There is evidence to suggest that one such common, potentially devastating class of events is that involving receipt of negative performance feedback.

## **Negative Life Events Involving Performance Feedback**

Performance feedback events refer to events in which an individual is evaluated in some way, whether explicitly or more covertly (e.g., Besser et al., 2004, 2008; Blackler, 2011; Cooks, 2017; Hewitt et al., 1989). In instances in which this feedback is negative or undesirable, the performance feedback event may then represent a specific type of negative life event. In particular, negative performance feedback has been defined as an expression of perceived or real discrepancy between one's goals and one's performance (Audia & Locke, 2003). Examples of these events may include negative feedback about poor job performance or other criticism from a boss or superior, receiving a poor grade, performing poorly in a competition (e.g., athletic, artistic, etc.), not being selected for an opportunity, being passed over for a raise, or other such experiences. Clearly, these events are quite common, as most individuals will receive some form of negative feedback throughout their lives (e.g., Belschak & Den Hartog, 2009; G. L. Bradley et al., 2016; Finkelstein et al., 2017). As stated, however, these events may also be quite harmful to the individual. There are several theories which may explain the destructive nature of these events.

### ***Theories on Consequences of Negative Life Events Involving Performance Feedback***

The nature of negative performance feedback may be elucidated through theories on cognitive dissonance, self-regulation, self-discrepancy, and self-efficacy, among others. While these theories developed fairly independently, and in parallel, there is nonetheless a considerable degree of conceptual overlap in their theses, making them highly compatible with one another.

In his Cognitive Dissonance Theory, Festinger (1957) proposed that individuals desire consistency and, when faced with information that violates this consistency, experience considerable discomfort. Inconsistency may arise between, for instance, what one believes and

actually does, or between one's own perception and that of others. Within this conceptualization, negative life events involving performance feedback may be aversive to the extent that they present inconsistent information about the self (e.g., G. Chen et al., 2015). The strength of this dissonance depends on a number of factors, including how the individual appraises and responds to inconsistent information, as well as the importance of the corresponding domain (Festinger, 1957; Metin & Camgoz, 2011). At the extreme — that is, when faced with dissonance in a highly valued domain — the individual may begin to feel profound incompetence, hopelessness, defeat, and even crisis. This proposal is supported by subsequent theorizing.

The Self-Regulation Theory proposed by Carver and Scheier (1981) offers a highly compatible conceptualization of the effects of negative life events involving performance feedback. Similar to Festinger, they postulate that individuals seek to reduce self-discrepancy; however, while Festinger considers discrepancies broadly, Carver and Scheier specifically consider discrepancies between behaviors and set criteria or standards. Further, they propose that detection of discrepancy depends on a high degree of self-focus. To this end, their theory may be expected to reflect more intense experiences of dissonance (e.g., feelings of defeat and dejection), as they specifically consider those domains to which the individual devotes considerable attention and for which he has set standards or expectations. Indeed, their theory bears resemblance to the beginning steps of Baumeister's (1990) Escape Theory of Suicide, in which discrepancy — which he conceptualizes as perceived failure to meet high standards or expectations — leads to aversive negative affect through a path of high self-focus. Accordingly, when negative performance feedback indicates discrepancy in an important domain, such as one for which an individual has developed standards and expectations, it may lead to more extreme maladaptive outcomes. While termed a “self-regulation theory” (Carver & Scheier, 1981), the

conceptual model nonetheless is fairly similar to theories on self-discrepancy, which likewise may be informative in explaining the effects of negative performance feedback.

Higgins's (1987) Self-Discrepancy theory specifically proposes that discrepancies between self-representations result in aversive affective states such as dejection, discouragement, and misery. This theory may be seen as building upon that of Carver and Scheier (1981); whereas the latter consider discrepancy between one's reality and one's standards broadly, Higgins breaks this down into discrepancies between individuals' realities (the *actual* self) and either their internal aspirations and qualities (the *ideal* self) or the aspirations and qualities they believe they should have (the *ought* self). Discrepancies between the actual and ideal self are theorized to signal the absence of positive outcomes; that is, such discrepancies may signal to individuals a failure to realize their potential or bring about sought-after hopes and aspirations. Discrepancies between the actual and ought self are theorized to signal the presence of negative outcomes; here, individuals may anticipate — at times accurately — that there will be social, instrumental, or other consequences for failing to meet others' expectations for themselves. As with preceding theories, the affective responses to these discrepancies may vary in intensity. At the extreme, when highly desired aspirations or standards are not met, Higgins proposes that individuals may experience dejection, distress, helplessness, perceived incompetence, and meaninglessness (1987). Within this conceptualization, negative life events involving performance feedback may signify to individuals that they are failing to achieve the standards they have set for themselves, or perhaps the standards which they believe are expected of them. When this corresponds to highly valued standards, feelings of defeat and crisis may follow.

Finally, Bandura's (1991) Self-Regulation Theory may provide additional insight into the effects of negative life events involving performance feedback. He proposes that self-regulation

reflects self-monitoring (e.g., attention to antecedents and consequences of one's own behaviors), comparisons of behaviors to standards, and affective self-reactions (e.g., distress when behaviors are inconsistent with standards). However, the degree to which this self-regulatory process can proceed effectively may depend on one's self-efficacy, or beliefs about one's own capabilities and control (Bandura, 1991). Consistent with the preceding theories, negative performance feedback may engender discrepancies between behaviors and standards, resulting in negative affect, ranging from unpleasant to devastating. In addition, and unique to Bandura's theory, this feedback may further hamper self-efficacy, interfering with effective self-regulation.

In summary, there exist several theories which may potentially explain the deleterious effects of negative life events involving performance feedback. While each offers a slightly different perspective, all evidence a clear theme of discrepancy. That is, the reviewed theories appear to converge on the role of discrepancy in bridging the effects of negative performance feedback on maladaptive outcomes. Accordingly, these theories begin to illuminate the destructive nature of negative life events involving performance feedback. Preliminary empirical work likewise supports these theorized concerning effects.

### ***Empirical Studies Examining Negative Performance Feedback***

Empirical studies have largely supported the maladaptive effects of receiving negative performance feedback. For example, in the workplace, receipt of negative performance feedback has been found to predict greater negative affect (Alam & Singh, 2019; Belschak & Den Hartog, 2009; Fishbach et al., 2010) lower self-efficacy and motivation (Dimotakis et al., 2017; Fonteyne et al., 2018), goal disengagement (Fonteyne et al., 2018), and even verbal and physical aggression (Geddes & Baron, 1997). Negative performance feedback in both academic (Biernat



& Danaher, 2012; J. D. Brown, 2010; Fishbach et al., 2010; M. Hall et al., 2012; Lundgren et al., 1998; Viciano et al., 2007; Weidinger et al., 2016) and social (Barry et al., 2006; J. D. Brown, 2010; Lundgren & Rudawsky, 1998) domains is associated with lower intrinsic motivation and self-worth and greater negative affect, distress, dissatisfaction, and devaluation of the relevant domain. In particular, negative feedback from parents may lead to greater concern over mistakes and a desire to avoid subsequent evaluation of performance (Madjar et al., 2015). In the lab, several studies have manipulated valence of performance feedback, finding support for an effect. In their study, Frost et al. (1995) induced participants to make a high versus low number of mistakes before being evaluated. Participants informed that they made a high number of mistakes reported greater negative affect, lower self-confidence, and a greater sense that they “should have done better.” Similarly, Besser et al. (2004) found that receipt of negative performance feedback, relative to positive (and controlling for actual performance), was associated with greater anxiety, dysphoria, hostility, disappointment, dissatisfaction with performance, cognitive rumination about mistakes, and negative comparative evaluations (i.e., perceptions of performance relative to others), as well as lower positive affect. In a subsequent study, Besser et al. (2008) found negative performance feedback to predict greater dysphoria and hostility and lower positive affect and self-esteem. In a number of studies, Stoeber et al. (2007, 2008, 2013, 2014; Stoeber & Yang, 2010) found negative performance feedback, relative to positive, to predict greater anxiety, depression, anger, shame, guilt, and embarrassment, and lower satisfaction and pride. Negative performance feedback may further predict poorer performance on subsequent tasks (Anshel & Mansouri, 2005; Blackler, 2011) and lower self-efficacy (Nease et al., 1999) and motivation (Van Dijk & Kluger, 2011). More recently, Cooks (2017; Cooks & Ciesla, 2019) and others (e.g., Choi et al., 2018; Lo & Abbott, 2019) have found negative

relative to positive performance feedback to predict greater negative affect and lesser positive affect. In summary, then, a growing body of empirical work supports that negative performance feedback predicts numerous maladaptive outcomes.

Therefore, not only does research suggest that negative life events involving performance feedback are common (e.g., Belschak & Den Hartog, 2009; G. L. Bradley et al., 2016; Finkelstein et al., 2017), but there is also theoretical and empirical support for their concerning downstream effects. To date, this has primarily been studied in relation to self-efficacy, motivation, goal disengagement, rumination, subsequent performance, and various indicators of negative affect. While this research is paramount in establishing the relationship of negative performance feedback with these outcomes, the pathway through which this operates remains unclear. This is not an insignificant gap; whereas preventing the occurrence of negative life events broadly— or receipt of undesirable feedback specifically — may prove extremely difficult, it may nonetheless be feasible to intervene upon intermediate factors, if these can be identified. As reviewed, the pathway by which negative life events come to relate to maladaptive outcomes may depend to some degree upon the nature of the life event itself. Consistent with this, there is reason to believe that negative life events involving performance feedback may operate through a specific, predictable pathway.

### **Performance Feedback Pathway of Risk**

As reviewed, proposed mechanisms of the effects of negative life events have tended to include stress and behavioral, emotional, and cognitive pathways. While negative life events involving performance feedback may be quite stressful, this leaves unanswered the question of “Why?”. That is, such events may bring about stress, among other reviewed outcomes, but the reason for these relationships is not clarified. While this type of negative life event may cause

stress through its generation of subsequent negative life events (e.g., negative feedback may precede loss of a job or termination of a relationship), any concerning outcomes caused by these life events, rather than the incident event, would not explain why performance feedback itself is maladaptive. It is possible that negative life events involving performance feedback bring about behavioral and emotional responses; indeed, the reviewed empirical work supports this. For instance, receipt of undesirable feedback may catalyze an individual to work harder and put in more effort (Cianci et al., 2010) or, alternatively, to disengage from goals (Anshel & Mansouri, 2005; Blackler, 2011; A. P. Hill et al., 2011) or become physically or verbally aggressive (Geddes & Baron, 1997). Certainly, these latter responses over time could lead to outcomes such as anxiety, depression, and suicidal thoughts and behaviors (as reviewed, however, it is unclear if the former response of adaptive behavioral responding would similarly serve as a mechanism or instead operate as a protective factor). Likewise, the research clearly supports that negative performance feedback may lead to aversive emotional reactions (e.g., Cooks, 2017; Cooks & Ciesla, 2019; Lo & Abbott, 2019). However, for negative performance feedback to lead to emotional and behavioral responses, it must *mean* something to the individual; a negative life event which has no personal meaning for one's status, functioning, or well-being would be unlikely to bring about such maladaptive outcomes. Accordingly, cognitive mechanisms may be integral in explaining the effects of these events.

Regarding the role of appraisals broadly, numerous theories support a cognitive pathway in predicting affective and behavioral outcomes (e.g., Beck, 1964; Fabes & Eisenberg, 1997; Folkman & Lazarus, 1984; Lazarus, 1991, 1999b, 1999c). In reviewing Lazarus's Appraisal Theory (e.g., Lazarus, 1999b; Lazarus & Launier, 1978), Gürcan-Yıldırım and Gençöz (2020, p. 3) write, "events or situations are not the cause of emotions; rather, how an individual appraises a

particular situation is responsible for their... outcome.” Specifically, Lazarus’s theory of appraisal postulates that individuals evaluate the implications of life events for personal well-being and functioning; the resulting cognitions reliably precede emotions (e.g., Lazarus, 1991, 1999b; C. A. Smith et al., 1993). This is very comparable to Bandura’s (1991) Self-Regulation Theory, reviewed earlier, in which the individual self-monitors to compare behaviors and circumstances to standards; discrepancies are theorized to produce affective responses which facilitate self-regulation of behavior and reduction of discrepancy. This sentiment is similarly espoused by Park (2012), who theorized that the effects of an event reflect how an individual has appraised it. Likewise, Rutter has repeatedly theorized on the role of cognitive appraisals in mediating the effects of life events (e.g., 1981, 1985b, 1999). Thus, the role of cognitions in preceding outcomes, including other potential mediators, is well-established by extant theory. However, it has been argued that, while there exists considerable research on *global* appraisal processes, *specific* situational appraisals remain understudied (C. L. Park et al., 2012; Steger & Park, 2012). Applied to the proposal that specific negative life events yield specific mechanisms, it may be argued that specific negative life events are associated with specific cognitive appraisals, which in turn explain downstream consequences.

Given the reviewed lack of agreement with regards to conceptualizing “types” of negative life events, the degree to which certain events may be met with certain cognitions, which in turn bridge the relationship between the event and identified maladaptive outcomes, has remained severely understudied. Nonetheless, there is some empirical support for such cognitive specificity. For instance, negative life events involving health threats may specifically lead to self-blame, whereas negative life events involving relationship stress may specifically lead to other-blame (Garnefski et al., 2003). However, other research has found no effect for health

threat events on self-blame, instead finding relationship stress events to uniquely predict depressive symptoms through effects on self-blame, catastrophizing, and rumination (Stikkelbroek et al., 2016). To this end, other characteristics of negative life events may be more informative. For example, Ahles et al. (2015) found that negative life events which were interpersonal and “dependent” — or life events involving others and for which an individual may be likely to feel responsible (e.g., conflict with a friend relative to, say, physical illness of a family member) — were more likely to lead to brooding rumination. In contrast, events which were dependent and non-interpersonal were more likely to lead to negative cognitive styles (e.g., perception of internal, global, and stable causes, and negative expectations for the future). In other words, events which may be classified as dependent and non-interpersonal may be appraised as individual problems for which one is responsible. Other research likewise finds that dependent events may lead to maladaptive outcomes such as depression through causal attributions that implicate the self (Cox et al., 2009; Grandin et al., 2007; Harkness & Stewart, 2009; Nicolai et al., 2013; Safford et al., 2007). Thus, there is some support for specific types of events (e.g., dependent events) leading to maladaptive outcomes through specific cognitive pathways (e.g., appraisals of personal responsibility). However, the most relevant support for this proposal may come from earlier research. Namely, Lakey and Edmundson (1993) found that negative life events divided into specific categories corresponding to the domains they affected (e.g., academic, family, romantic relationships, etc.) led to depressive symptoms through cognitions of failing to meet expectations specific to respective roles (e.g., role as a student, daughter, partner, etc.). The effects of a given life event, then, may be worse when certain cognitions — specific to that life event — occur. In light of this research, negative life events

involving performance feedback may come to be destructive through their specific effects on appraisals of falling short of standards.

As reviewed, numerous theories suggest that negative performance feedback life events may beget self-discrepancy, or perceptions of dissonance between one's aspirations and one's current performance (e.g., Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987), supporting a pathway of falling short of standards. Namely, Festinger's Cognitive Dissonance Theory (1957) proposed that individuals are motivated to achieve consistency, including between their standards and their actual performance. Aversive inconsistency, then, would be produced by appraisals of falling short of standards. Indeed, Carver and Scheier (1981) and Bandura (1991) specifically center their self-regulation theories on discrepancy between standards and actual behavior — in other words, on appraisals of falling short of standards. Similarly, Higgins's (1987) actual, ideal, and ought selves indicate the role of such appraisals; in particular, discrepancies between the actual and ideal self are theorized to reflect appraisals of falling short of one's goals or perceived potential, which in turn may bring about consequences such as extreme negative affect. Finally, Baumeister's (1990) Escape Theory of Suicide provides clear support for the role of these appraisals in the pathway to maladaptive outcomes. A suicidal crisis is theorized to result from a negative life event involving failure or setback and which is appraised as the individual's having fallen short of standards (Baumeister, 1990). In this way, numerous theories support a role of falling short of standards in mediating the effects of negative performance feedback events.

To date no known study has tested an integrated mediational pathway through appraisals of falling short of standards. Nonetheless, there is preliminary empirical support for performance feedback events being mediated by these specific appraisals. For example, Kluger and DeNisi's

meta-analysis (1996) suggests that individuals faced with normative negative performance feedback (i.e., results are presented relative to others) may actually cease to focus on the task at hand and instead become preoccupied with the perceived implications of performance (e.g., with regards to one's ability, worth, status, etc.). More direct support comes from Cianci et al. (2010), who found that negative performance feedback led to greater tension when participants were assigned a performance goal, relative to a learning goal; in other words, tension resulted when participants were led to believe they had fallen short of a specific standard. In qualitative interviews of academically gifted students, Neumeister (2004a) found that participants tended to appraise failures as indicative of putting forth insufficient effort to meet perceived standards. While not specifically considering performance feedback events, Bender (2020) found negative life events broadly to relate to appraisals of falling short of standards. In contrast, Besser et al. (2004) did consider performance feedback events specifically, and found negative performance feedback to lead to appraisals of failing to meet expectations. While providing strong support for the beginning steps of a performance feedback pathway of risk, the authors did not include more downstream outcomes (e.g., distress, mental health difficulties), and the extent to which appraisals would mediate any such relationships remains unclear. In a more recent study, Berke et al. (2017) provided men performance feedback on a "Gender Knowledge Test;" those randomly assigned to the negative feedback condition reported greater gender role discrepancy, or perceptions of failing to meet expectations and standards in their role as a "man." Again, this supports the preliminary steps of a performance feedback pathway of risk, but comes short of testing a fully integrated model. Thus, although needing additional research, there is some support for a specific pathway of negative performance feedback through appraisals of falling short of standards and expectations.

In summary, the meaning an individual assigns an event may be hugely influential in predicting its consequences; accordingly, cognitive mechanisms may be an integral step in this pathway. Further, the specific cognitions brought about by a given negative life event may depend in large part upon the event itself. In considering negative life events involving performance feedback, there is some theoretical and empirical evidence to suggest the role of appraisals of falling short of standards specifically. Nonetheless, it is clear that not everyone exposed to this highly prevalent negative life event will respond in the same way. Here, individual difference factors may clarify patterns of resilience and vulnerability.

### **Resilience in the Face of Negative Life Events**

Conceptualizations of resilience may provide valuable insight into the qualities which serve to protect individuals against the pernicious effects of negative life events, including those involving performance feedback. Resilience — Latin for “to leap back” — has been broadly defined as the ability to react positively, or even to thrive, in the face of stressful or challenging life circumstances (e.g., Masten et al., 1992; Rutter, 2006a, 2013) and is considered to be the modal response to adversity (e.g., G. A. Bonanno, 2001, 2005; G. A. Bonanno et al., 2011; Galatzer-Levy et al., 2018; Masten, 2001). Integral to conceptualizations of resilience is the presence of both adversity and positive adaptation (Fletcher & Sarkar, 2013). That is, resilience is not simply the absence of misfortune, but effective responding in the face of it (G. A. Bonanno, 2004; Connor & Davidson, 2003; Leipold & Greve, 2009; Luthar et al., 2000; Masten et al., 1990; Masten, 2001; Rutter, 1987). This effective responding appears to reflect both flexible adaptation to changing environments and a pragmatic, at times rigid, willingness to do “whatever it takes” (G. A. Bonanno, 2005; G. A. Bonanno & Mancini, 2008; Mancini & Bonanno, 2006). It may further depend on the adversity and population in question; in some



instances (e.g., with school-aged children) this may be evidenced by academic achievement or prosocial behavior, whereas in others (e.g., survivors of assault) this may be evidenced by the absence of psychiatric impairment (Fletcher & Sarkar, 2013; Luthar, 2006; Luthar et al., 2000). Resilience differs from study of static protective factors, in that it is theorized to be a dynamic process, involving an ongoing interaction between individuals' resources and their environments (G. A. Bonanno et al., 2011; Norris et al., 2008; Rutter, 2006a, 2007, 2012; Shiner & Masten, 2012). While initially conceptualized to be a fairly stable trait (e.g., J. H. Block & Block, 1980; J. Block & Kremen, 1996), it may instead depend on situational and temporal factors; one may be resilient in the face of certain environmental circumstances, or at certain points throughout the lifespan, but not others (Davydov et al., 2010; Fletcher & Sarkar, 2013; Rutter, 1981, 2006a; Vanderbilt-Adriance & Shaw, 2008). Further, whereas resilience by definition must emerge *in the face of adversity*, researchers have increasingly become interested in identifying and enhancing those factors which may predict resilience even *before* one confronts stressful circumstances (e.g., G. A. Bonanno et al., 2011). That is, it has increasingly become recognized that resilience comprises not only consequences, but also the antecedents (e.g., the characteristics that an individual *brings into* challenging circumstances) and behaviors (e.g., the way an individual responds *during* these circumstances) which contribute to resilient outcomes (Earvolino-Ramirez, 2007; Windle, 2011). Thus, in considering who may demonstrate resilience in the face of negative life events, and why, it is essential to consider its emergence across these domains.

### ***Antecedents to Resilience***

The factors an individual brings into a negative life event or other adversity may be hugely influential in determining trajectories of risk versus resilience. Rutter (1995) proposed

that these may be factors which broadly reduce exposure to or impact of adverse experiences, prevent or interrupt negative chain reactions, or promote positive opportunities. More specifically, these may reflect biological (e.g., genetics), psychological (e.g., self-regulation, planning, self-efficacy), and social variables (e.g., social support; Rutter, 2006a, 2013), among others. Because resilience is more common than not (e.g., G. A. Bonanno, 2001, 2005; Galatzer-Levy et al., 2018; Masten, 2001), antecedents will be heterogeneous and vary between persons and situations (G. A. Bonanno et al., 2011). Nonetheless, it may be possible to broadly discriminate antecedents by whether they are external or internal to the individual.

**External Antecedents.** An individual may be buffered against the effects of adversity given numerous external factors including history of negative life events, perceived and actual access to resources, and perceived and actual access to social support, among others. Although there is somewhat equivocal evidence (e.g., see Bonanno, 2007; Brewin et al., 2000), prior research tends to suggest that exposure to negative life events may have an “inoculating” effect against their pernicious consequences, much like a vaccine to a virus (Bonanno et al., 2010; Dienstbier, 1989; Elder Jr, 1974; Hennessy & Levine, 1979; Rutter, 1981b, 2006a, 2007, 2012). Exposure to stressors and negative life events may produce a “steeling” effect, whereby individuals change with regards to “physiological adaptation, psychological habituation, a sense of self-efficacy, the acquisition of effective coping strategies, and/or a cognitive redefinition of the experience” (Rutter, 2006a, p. 2); these skills may then aid in overcoming subsequent adversity. Thus, whether exposure to prior negative life events enhances vulnerability versus resilience likely depends on how well the individual was able to cope with these initial events (Rutter, 2006a, 2009). Beyond prior exposure to negative life events, access to external resources — such as financial, housing, educational, and healthcare resources — may also enhance

resilience. This may reflect the fact that external resources make it easier to address the consequences of many negative life events (e.g., it may be easier to respond effectively to a serious health condition when one has adequate healthcare). For example, substantial research suggests that socioeconomic status can influence exposure to and recovery from negative life events (G. A. Bonanno et al., 2007; Desmond, 2016; B. P. Dohrenwend & Dohrenwend, 1969; Evans & Kim, 2013; Haushofer & Fehr, 2014; Hawkins, 2009; Hobfoll, 1989, 2002; Lantz et al., 2005; Luby et al., 2013; Rabkin & Struening, 1976; Santiago et al., 2011; Steele et al., 2016; Wadsworth et al., 2008). Simultaneously, improving individuals' access to external resources has been found to predict more resilient outcomes (e.g., Andrea et al., 2020; Gertner et al., 2019). However, the extent to which external resources facilitate resilience may depend on internal factors (e.g., the extent to which the individual *perceives* access to, or is aware of, external resources; attitudes towards use of resources; etc.). In a similar manner, access to personal social support may enhance resilience; individuals with greater social support may feel a greater sense of belonging, acceptance, inclusion, and respect (Goodenow, 1993; Joiner, 2005), and may perceive greater access to other resources (Goodenow, 1993). Empirical research appears to support the effect of social support on resilience (Bonanno et al., 2002, 2008; Bonanno, 2007; Brewin et al., 2000; Collishaw et al., 2007; Dong et al., 2017; DuMont et al., 2007; Hawken et al., 2019; Kaniasty & Norris, 2009; La Greca et al., 1996; Norris et al., 2002; Wang et al., 2018; Yang et al., 2018), although this research has at times been inconclusive (e.g., Donnellan et al., 2017; Stroebe et al., 2005) and social relationships themselves may not be independent of negative life events (Rutter, 1985b). Further, as with external resources, the extent to which social support facilitates resilience may depend on internal factors such as the individual's perception of this support (Cauce et al., 1982). Thus, while external factors appear to contribute

to resilience, one's perception, and other internal factors, may be especially important in predicting resilience.

**Internal Antecedents.** As with external antecedents, there are myriad internal antecedents which may influence resilience; this may operate through their effects on attention to negative life events, as well as one's behavioral, emotional, and cognitive responses therein. To start, similar to perception of external resources and social support, internal antecedents may affect perception of negative life events, such that some may be more likely to attend to and remember aversive experiences (e.g., Everaert & Koster, 2020; Linehan, 1993; Marchetti et al., 2018; Rinck & Becker, 2005). For instance, individuals may have greater emotional sensitivity to environmental stressors (Linehan, 1993). In this way, decreased emotional sensitivity, or more positive biases in attention and recall, may enhance resilience. When a negative life event is perceived, internal factors may affect how one behaviorally responds; factors associated with greater resilience may include a positive problem-solving orientation (e.g., tendency to use more active problem-solving strategies; Adams & Adams, 1991, 1993, 1996; Dreer et al., 2019; Erdley-Kass et al., 2018; Spence et al., 2002; Viola et al., 2018), greater self-efficacy (Cassidy, 2015; deRoos-Cassini et al., 2010; Gu & Day, 2007; Rutter, 1995; Schwarzer & Warner, 2013; H. Taylor & Reyes, 2012; J. Ullman & Newcomb, 1999; Wang et al., 2018), greater grit (Blalock et al., 2015; Kleiman et al., 2013; G. Meyer et al., 2020), and a diverse repertoire of adaptive emotion regulation and coping strategies (Agaibi & Wilson, 2005; Aldao et al., 2010; Baratta & Maier, 2019; J. H. Block & Block, 1980; G. A. Bonanno, 2005; G. A. Bonanno et al., 2011, 2012; Galatzer-Levy et al., 2012, 2018; Gross, 1998a, 1998b; Iacoviello & Charney, 2014; Kashdan & Rottenberg, 2010; Leipold et al., 2019; Mancini et al., 2011; Rutter, 2007; Vaccaro et al., 2019). Other internal antecedents may instead affect one's emotional responses to negative

life events; greater resilience may result from higher positive affectivity and lower negative affectivity (G. A. Bonanno & Keltner, 1997; Fredrickson et al., 2003; Papa & Bonanno, 2008; Quale & Schanke, 2010; Weems et al., 2010), lower emotional lability (e.g., Linehan, 1993), and faster return to baseline mood (e.g., Linehan, 1993). In addition to awareness of negative life events and behavioral and emotional responding, internal antecedents may also affect cognitive processes. Greater resilience may occur in the context of greater cognitive flexibility (Genet & Siemer, 2011; Iacoviello & Charney, 2014; Kashdan & Rottenberg, 2010; Soltani et al., 2013), lower likelihood of ruminative cognitive styles (Nolen-Hoeksema & Morrow, 1991), greater trait self-enhancement (e.g., self-serving biases; Bonanno et al., 2002, 2005; Mancini & Bonanno, 2009; Taylor & Brown, 1988, 1994), a well-developed a priori worldview and sense of meaning/purpose (G. A. Bonanno, Wortman, et al., 2002; R. A. Bryant & Guthrie, 2007; Kashdan & McKnight, 2013; Kleiman et al., 2013; Kleiman & Beaver, 2013; Machell et al., 2016; Mancini et al., 2011; McKnight & Kashdan, 2009; C. L. Park et al., 2008), greater gratitude (Kleiman et al., 2013), fewer maladaptive personality traits (e.g., particularly lower perfectionism; Campos et al., 2018; E. C. Chang & Rand, 2000; Cheng, 2001; Dean et al., 1996; Dean & Range, 1996; Enns & Cox, 2005; Flett et al., 1995; Hewitt et al., 1994, 1996, 2020; Hewitt & Dyck, 1986; Johnson et al., 2017; Joiner & Schmidt, 1995; J. Klibert et al., 2014; Lynd-Stevenson & Hearne, 1999; R. C. O'Connor et al., 2010; R. C. O'Connor & O'Connor, 2003; M. M. Smith et al., 2016, 2017d, 2018a; M. M. Smith, Sherry, Chen, et al., 2018; M. M. Smith, Sherry, McLarnon, et al., 2018), and greater levels of the distinct but related constructs of hope, optimism, and positive future thinking (Carver et al., 2010; Carver & Scheier, 2014; Goodman et al., 2017; Huffman et al., 2014; Hunter & O'Connor, 2003; Iacoviello & Charney, 2014; Kleiman et al., 2017; R. C. O'Connor et al., 2004; O'Connor et al., 2007b; R. C. O'Connor

et al., 2015; Ong et al., 2006; Visser et al., 2013), among other possible antecedents. Clearly, then, there are a number of factors which may coalesce in bringing about resilience. Given that negative performance feedback events are both highly common and highly pernicious, and given calls in the literature to identify resilience factors tailored to specific adversities (e.g., Davydov et al., 2010; Fletcher & Sarkar, 2013; Rutter, 1981, 2006a; Vanderbilt-Adriance & Shaw, 2008), it may be important to focus on internal antecedents that are likely to be particularly protective relative to this type of negative life event. Here, theory and research suggest a role for perfectionism and positive future thinking; whereas the former may affect how such negative life events are appraised — and what they mean for the individual’s current functioning — the latter may affect what the event means for one’s future.

***Perfectionism.*** Perfectionism has been broadly defined as the combination of extremely — and at times unrealistically — high standards with an overly critical self-evaluation (e.g., Burns, 1980; Flett et al., 1989; Frost et al., 1990; Hewitt et al., 1989, 1991; Hewitt & Flett, 1991b, 1991a; Slaney et al., 2001). Perfectionism is characterized by cognitive distortions (e.g., “black and white” thinking; Burns, 1980) and perceptions of self-discrepancy (Slaney et al., 2001). Notably, perfectionism does not appear to be unidimensional; rather, it may be delineated into different dimensions corresponding to the source of one’s standards and anticipated consequences of falling short of these standards. In particular, Hewitt and Flett (1988, 1991) proposed that perfectionism may be discriminated into two broad types — *self-oriented perfectionism*, in which individuals set high standards for themselves and perceive primarily intrapersonal consequences of failure (e.g., failure may have implications for one’s self view or individual future, etc.) and *socially prescribed perfectionism*, in which individuals believe that others have high standards and expectations for them and perceive primarily interpersonal

consequences of failure (e.g., failure may have implications for one's standing in others' eyes or may negatively affect social support systems, etc.). It has been theorized that the perceived source and consequences of standards are hugely influential in perfectionism's destructive consequences (Bieling et al., 2004; Conroy et al., 2007; Frost et al., 1990, 1993; Hewitt et al., 1988, 1989, 1991; Hewitt & Flett, 1991b). This is supported by empirical work; across the literature, socially prescribed perfectionism shows a larger, more consistent, and more significant relationship with psychopathology and other concerning outcomes (Bender, 2020; Enns & Cox, 1999; Flett et al., 1991, 2004; Hewitt et al., 2020; Hewitt & Flett, 1991b, 1991a; Limburg et al., 2017; T. R. Martin et al., 1996; Shafran & Mansell, 2001; M. M. Smith, Sherry, Chen, et al., 2018; M. M. Smith, Sherry, McLarnon, et al., 2018; Wetherall et al., 2019; Wyatt & Gilbert, 1998). Accordingly, perfectionism may represent two dimensions, corresponding to intra- and interpersonal constructs; perfectionism may be more pernicious to the extent that it reflects perceptions of interpersonal standards and consequences. In addition to the concerning independent effects of socially prescribed perfectionism, this dimension of perfectionism may likewise deplete resilience in the face of negative life events. This proposal is supported by extant theory.

Several theories exist to support a role of socially prescribed perfectionism in affecting resilience to negative life events. Drawing from theories of suicide, Baumeister's Escape Theory of Suicide (1990) specifically proposes that a suicidal crisis begins when an individual confronts a negative life event which falls short of standards, which in turn leads to a state of extremely aversive negative affect. In particular, he writes, "suicide may arise either because standards are unrealistically high or because events are unusually bad (or both)" (Baumeister, 1990, p. 91). Given that perfectionism is theoretically (Burns, 1980; Frost et al., 1993; Hewitt & Flett, 1991b)

and empirically (e.g., Sherry et al., 2016; L. Taylor, 2020; Trumpeter et al., 2006) linked with high standards, self-criticism, and less satisfaction with progress towards goals, it is possible that it may be associated with poorer resilience because it predisposes the individual to appraise a negative life event as falling short of standards. That is, individuals who — prior to encountering adversity — tend to be more perfectionistic may fare worse in the face of a negative life event, because they may be more likely to appraise it as falling short of standards, which in turn may incite negative affective states along the pathway to suicide risk (Baumeister, 1990). Indeed, there exists some correlational research linking socially prescribed perfectionism to the acute state of demoralization through appraisals of negative life events as falling short of standards (Bender, 2020). As suggested by Baumeister’s theory, and as supported by this preliminary empirical work, individuals with elevated perfectionism may be more prone to feeling defeated, demoralized, or entrapped by negative life events appraised as falling short of standards.

Williams’s Cry of Pain Model of Suicide (1997, 2001) proposes that suicidal crisis occurs when an individual feels demoralized, defeated, or entrapped by a negative life event, and when hope for rescue (i.e., positive future thought or external social support) is low. This is comparable to theories of arrested flight (Gilbert & Allan, 1998) and learned helplessness (Klein et al., 1976; I. W. Miller & Norman, 1979; Seligman & Beagley, 1975). Within this framework, socially prescribed perfectionism may predict poorer resilience in the face of negative life events — particularly performance feedback events — to the extent that such individuals are more likely to feel defeated and entrapped by these events. Although severely understudied, there is preliminary empirical support for the proposal that socially prescribed perfectionism in particular is associated with defeat (Wetherall et al., 2018; Wyatt & Gilbert, 1998). This may operate alongside the processes proposed by Baumeister; for example, an individual higher in



perfectionism may be more likely to appraise an event as falling short of standards *and* may be more likely to feel defeated by their inability to meet these standards (Bender, 2020).

Furthermore, socially prescribed perfectionism may potentiate the impact of negative life events through its effects on social resources; that is, a growing body of work suggests this dimension of perfectionism may deplete social connectedness and support (C. Chen et al., 2015; Flett et al., 1997; Hewitt et al., 2006; R. W. Hill et al., 1997; Mushquash & Sherry, 2012; Roxborough et al., 2012), effectively diminishing an individual's "hope for rescue." More recently, O'Connor (2011) has attempted to integrate across theories of suicide to present a cohesive pathway by which risk may emerge; within this framework, he specifically invokes the role of perfectionism.

The Integrated Motivational-Volitional Model of Suicide (IMV; O'Connor, 2011) proposes that suicidal risk may be divided into three primary phases — premotivational (i.e., background factors, including diathesis, environment, and life events), motivational (i.e., factors implicated in the development of suicidal ideation), and volitional (i.e., factors implicated in the transition from ideation to behavior) — within which negative life events and perfectionism may operate. Specifically, O'Connor proposes that premotivational factors, such as perfectionism and negative life events, may lead to suicidal ideation through their effects on the motivational factors of defeat, humiliation, entrapment, and loss, drawn from Williams's Cry of Pain Model (1997, 2001). O'Connor states:

Within the IMV model... sensitivity to signals of defeat may be increased by *what we believe others expect of us* [emphasis added]. In suicidal individuals such expectations are often *excessive and unrealistic* [emphasis added], with the suicidal individual believing that they will be considered a failure if they do not achieve certain standards...

Individuals with such beliefs are thought to score highly on the personality dimension called socially prescribed perfectionism. (2011, p. 188)

Highly compatible with the research on resilience, O'Connor's IMV model allows for numerous other factors to operate along this pathway. For instance, the emergence of suicide risk may vary depending on factors such as coping and problem solving skills, rumination, memory and attentional biases, social support, positive future thought, thwarted belongingness, and perceived burdensomeness, among others. As will be noted, however, these may not be entirely independent of perfectionism. Thus, as proposed by Baumeister and Williams, perfectionism may deplete resilience in the face of negative life events to the extent that it leads to appraisals of failing to meet standards, which in turn may signal defeat, humiliation, or other similarly aversive states. Given the reviewed theoretical support, it is somewhat unsurprising that there is likewise growing empirical support for this postulation.

There is considerable empirical evidence that perfectionism may meaningfully influence trajectories or risk versus resilience in response to negative life events. For instance, research has found perfectionism to affect the relationships between negative life events and depressive symptoms (Cheng, 2001; Hewitt & Dyck, 1986; Lynd-Stevenson & Hearne, 1999); prospective distress, psychological adjustment, anxiety, and depression (Campos et al., 2018; E. C. Chang & Rand, 2000; Flett et al., 1995; Hewitt et al., 1996; Joiner & Schmidt, 1995; R. C. O'Connor et al., 2010); prospective nonsuicidal self-injury (NSSI; R. C. O'Connor et al., 2010); suicidal ideation (Hewitt et al., 1994); and suicidal behaviors (Dean et al., 1996; Dean & Range, 1996). However, other research has failed to find such an effect, with negative life events being experienced similarly regardless of levels of perfectionism (Bender, 2020; Dean & Range, 1999; Hewitt et al., 1996, 2002). As suggested by the reviewed diversity in negative life events and

antecedents to resilience, it may be that perfectionism affects resilience to *certain types* of negative life events — namely, events involving performance feedback. Such events may be particularly likely to activate perceptions of falling short of standards and accompanying experiences of defeat and entrapment. To date, this model remains untested. Nonetheless, there is some evidence to suggest that perfectionism potentiates the effects of negative performance feedback events specifically.

A review of the research on performance feedback negative life events reveals that perfectionism may be highly influential in predicting lack of resilience to these events. For example, in studies in which all participants are given negative performance feedback, but other dimensions are varied (e.g., task importance), perfectionism has been found to predict greater dysphoria, shame, guilt, perceptions of threat, dissatisfaction, and self-handicapping on subsequent trials (Curran & Hill, 2018; Hewitt et al., 1989; A. P. Hill et al., 2011). While not examining receipt of feedback directly, Frost et al. (1997) had participants use a daily diary to self-monitor mistakes, which participants were aware would be later reviewed by the researchers. Participants generally responded negatively to mistakes, but perfectionism predicted more intensely negative reactions, such that participants with elevated perfectionism were more bothered by mistakes, rated mistakes as more important, believed their mistakes caused significantly more harm, were more worried about others' reactions to their mistakes, reported greater desire to keep mistakes secret, and more frequently thought about their mistakes. In the studies reviewed earlier, perfectionism augmented the effect of this negative performance feedback on outcomes such as general negative affect, anxiety, hostility, dysphoria, disappointment, shame, guilt, rumination, self-esteem, physiological reactions (i.e., heart rate and systolic blood pressure), and self-handicapping on subsequent trials, among other outcomes

(Anshel & Mansouri, 2005; Besser et al., 2004, 2008; Blackler, 2011; Cooks, 2017; Cooks & Ciesla, 2019; Frost et al., 1995; Lo & Abbott, 2019; Stoeber et al., 2007, 2008, 2013, 2014; Stoeber & Yang, 2010). Further, upon receipt of negative performance feedback, individuals with elevated perfectionism may be less willing to share performance results and more likely to perceive that others would view them as less intelligent due to their performance (Frost et al., 1995). Importantly, the extant research supports that socially prescribed perfectionism, rather than self-oriented perfectionism, affects the experience of negative performance feedback (e.g., Besser et al., 2008; Flett et al., 1994; Johnson et al., 2017; Stoeber et al., 2008, 2013; Stoeber & Yang, 2010), such that it is experienced as more aversive among those with greater interpersonal perfectionism. Thus, the research tends to suggest that perfectionism may directly affect resilience in response to negative life events, particularly performance feedback events. Beyond this direct effect, perfectionism may also potentiate the impact of negative life events through its effect on other antecedents to resilience and immediate responses to negative life events.

While myriad factors are implicated in resilience, these may not be entirely independent of perfectionism. For example, perfectionism may affect attention and sensitivity to environmental stressors, particularly negative performance feedback, as it has been found to predict fear of negative evaluations (Hewitt & Flett, 1991b). Perfectionism may also be associated with a less effective problem solving orientation (Besser et al., 2010; Flett et al., 1996; A. G. Lucas et al., 2019), lower self-efficacy (Hewitt & Flett, 1991b; J. J. Klibert et al., 2005; Sun et al., 2006; Yu et al., 2016), and poorer grit (Cormier et al., 2019; Korbel & Martin, 2019). Perfectionism may inversely relate to presence of meaning in life (H. Park & Jeong, 2016; Sutton, 2019) and gratitude (Oros et al., 2017; Petrocchi & Couyoumdjian, 2016). Further, perfectionism may be associated with less effective coping and emotion regulation strategies; for

instance, perfectionism has been found to predict less effective coping strategies (e.g., avoidant coping; Abdollahi et al., 2018; Dunkley et al., 2000, 2006; Dunkley & Blankstein, 2000; Dunn et al., 2006; Hewitt & Flett, 1991b; A. G. Lucas et al., 2019; Madigan et al., 2018; Noble et al., 2014; Pacewicz et al., 2018; Prud'homme et al., 2017; Sun et al., 2006; van der Kaap-Deeder et al., 2016; Weiner & Carton, 2012) and self-handicapping behaviors such as procrastination (J. J. Klibert et al., 2005; T. R. Martin et al., 1996; Neumeister, 2004b; Saddler & Sacks, 1993; Sheykhi et al., 2013; Sudler, 2014), reduced effort after perceived failure (A. P. Hill et al., 2011), and disruption of social support (Flett et al., 1997; R. W. Hill et al., 1997; Mushquash & Sherry, 2012), among others. Perfectionism is additionally associated with greater negative affectivity, lower positive affectivity, and greater emotional lability (Aldea & Rice, 2006; Besser et al., 2004, 2008; Flett et al., 2009; Montano et al., 2016; Stoeber et al., 2014). In summary, then, perfectionism may not only impair resilience in the face of negative life events directly, but may also do so through its effects on other antecedent factors and behavioral responses. In particular, and as suggested by theory, perfectionism may deplete resilience through its effects on cognitive appraisals.

A substantial body of research suggests that perfectionism may affect resilience through its effects on cognitive processes. Namely, perfectionism is associated with greater cognitive rigidity and cognitive distortions (Buzzichelli et al., 2018; Davis & Wosinski, 2012; Egan et al., 2007; Graham et al., 2010; Hewitt et al., 1991; Hewitt & Flett, 1991b; Rudolph et al., 2007), increased rumination (Blankstein & Lumley, 2008; Flett et al., 2002; D. B. O'Connor et al., 2007a; Olson & Kwon, 2008; Rudolph et al., 2007; van der Kaap-Deeder et al., 2016), and greater self-criticism and self-blame (Hewitt & Flett, 1991b; Rudolph et al., 2007; Sherry et al., 2016; L. Taylor, 2020). Perfectionism may further predict internal attributions of failure and

overgeneralization of failures (Neumeister, 2004a). Additionally, as reviewed, perfectionism may predict fear of negative evaluation (Hewitt & Flett, 1991b). Given these associations, it is conceivable that perfectionism may reduce resilience in the face of negative life events through its effects on appraisals of those events. In considering the theories of Baumeister (1990), Williams (1997, 2001), and O'Connor (2011), perfectionism may specifically make an individual more likely to appraise a negative life event — particularly an event involving negative performance feedback — as an instance of falling short of standards. The individual may feel defeated or demoralized by this shortcoming, leading to less resilient outcomes. While this is well-supported by theory and extant empirical work, this remains understudied.

In summary, several theories support the proposal that perfectionism may meaningfully affect resilience in response to negative life events (Baumeister, 1990; O'Connor, 2011; Williams, 1997, 2001). Perfectionism may make the individual more likely to both appraise negative life events as falling short of standards and to feel demoralized or defeated by this perceived shortcoming. However, as postulated by Williams (1997, 2001), the degree to which individuals become demoralized may depend on their hope for rescue, including the accessibility of positive future thinking.

***Positive Future Thought.*** Positive future thinking refers to positive cognitions regarding the number and likelihood of specific positive outcomes to specific future events (MacLeod et al., 1993; MacLeod & Cropley, 1995). Positive future thinking may also vary with regards to frequency and ease in generating these positive outcomes for future events (MacLeod et al., 2005; MacLeod & Cropley, 1995; Miranda et al., 2008). Although positive future thinking is closely related to the constructs of hope and optimism (e.g., all of these constructs can include general positive cognitions related to one's future, and all are theorized to be associated with

greater resilience; Carver et al., 2010; Kirmani et al., 2015; MacLeod & Conway, 2007; Snyder, 1994), it differs in important ways. Namely, positive future thinking appears to be a narrower, more specific, and more mutable construct, which itself may *reflect* one's degree of corresponding hope and optimism; in this way, it may be a less stable indicator of these more enduring, underlying characteristics. In particular, optimism may represent a trait-like disposition — an on-going, general tendency to view oneself, the world, and one's future in a positive light (e.g., Beck, 1979). Whereas optimism may vary over time, or may be influenced to a degree by situational factors, it is likely far less vulnerable to such fluctuation than positive future thought, which corresponds to specific future events. Intermediate to either construct may be the related construct of hope; namely, optimism, as a tendency toward a positive inferential style, may beget the positive cognitive and affective elements of hope, which in turn increase one's positive future thinking. In other words, hope may bridge the other two constructs, reflecting trait-like “hopeful” cognitive schemas and positive emotionality that may then be applied to specific events to produce positive cognitions and emotions. That is, hope may facilitate positive thoughts for the outcomes of specific future events. In this way, positive future thought may be one of several possible manifestations of hope, which may also include thoughts related to one's ability to achieve desired outcomes; perceptions of external support or favorable environmental conditions; perceptions of “good luck,” fate, or serendipity; or other such manifestations. Indeed, these and other manifestations of hope may themselves contribute to positive future thinking (e.g., individuals who appraise themselves as able to bring about desired outcomes will likely also report anticipating a greater number of positive future events). In sum, optimism may shape the lens through which individuals view themselves, their world, and their future; where hope reflects the lens, positive future thinking may be thoughts that are a product of this view.

Accordingly, optimism, hope, and positive future thinking may be highly related — perhaps even nested — constructs, progressing along a pathway from less to more specific and variable.

Existing theory and literature support that optimism, hope, and positive future thinking represent interconnected constructs, which vary with regards to their breadth and stability. Optimism has been described as “the tendency to believe that one will generally experience good versus bad outcomes in life” (Scheier & Carver, 1985, 1992, p. 203) and has been theorized to encompass the expectation of positive future outcomes (Bryant & Cvengros, 2004; Carver et al., 2010; Carver & Scheier, 2014; Chang et al., 2013; Scheier & Carver, 1985; Seligman, 1991; Sharot et al., 2007), positive inferential styles (Peterson & Seligman, 1984; Seligman, 1991), an internal locus of control (Alloy & Abramson, 1979), and self-enhancing biases (Weinstein, 1980), among other factors. Carver and Scheier are explicit in describing optimism as stable, broad, general, and fairly impervious to change, rather than context-specific (Carver et al., 2010; Carver & Scheier, 2014; Scheier & Carver, 1985, 1992), and this is supported by empirical research (Atienza et al., 2004; Carver et al., 2010; R. E. Lucas et al., 1996; Matthews et al., 2004; Renaud et al., 2018; Scheier et al., 1994; Scheier & Carver, 1985). As may be expected, optimism has been found to predict greater hope (e.g., M. W. Gallagher & Lopez, 2009; Kelberer et al., 2018; Shorey et al., 2007). Collectively, this would be consistent with the proposal that optimism is a broad, underlying factor which may influence downstream hope and subsequent positive future thinking.

Likewise, the proposal that hope reflects cognitive schemas, which may then be applied to specific situations and events, is supported by Snyder’s Hope Theory (Snyder, 1994, 2000). Specifically, Snyder conceptualized hope as a bidimensional construct, reflecting a sense of agency and pathways; the former refers to one’s perceived ability to bring about desired



outcomes and goals (Snyder, 2000) while the latter refers to one's perceived ability to identify action steps necessary to bring about outcomes, to respond flexibly to setbacks and obstacles, and to generate and pursue alternative mechanisms of achieving goals when necessary (Snyder, 1998, 2000). Conceptualizations of hope have continued to invoke perceptions of agency and flexibility in goal pursuit (e.g., Bryant & Cvengros, 2004; Goodman et al., 2017; Kelberer et al., 2018; Ong et al., 2012). To this end, optimism may predispose one to hope, or to these cognitive schemas, which may then be applied to specific events and situations. Although the literature has not explicitly positioned hope as a construct nested within optimism, there appears to be support for doing so. Indeed, in describing optimism's effects on behavior, Scheier and Carver specifically refer to perceptions of goal attainability and perceptions of ability to identify and act upon steps towards goal achievement (Scheier & Carver, 1992). They also include reference to affective elements of hope, such as enthusiasm, excitement, joy, or elation (Carver & Scheier, 1990a, 1990b; Scheier & Carver, 1988, 1992; Stotland, 1969). This latter point highlights a potential limitation of Snyder's Hope Theory and some inconsistency in the literature. Namely, Snyder and related hope theorists have primarily conceptualized hope as a construct reflecting *cognitions* about *oneself*; nonetheless, there is reason to believe one may experience hope in relation to external factors, such as one's environment or external resources, or may additionally experience hope as an emotion. For instance, other theorists have specifically invoked hope in relation to social support (e.g., hope for rescue in the Cry of Pain model of suicide; Williams, 1997, 2001), external/environmental circumstances (Averill et al., 2012; Bernardo, 2010, 2015; Cutcliffe, 1996; DuFault & Martocchio, 1985; D. S. Kim et al., 2006; Lazarus, 1999a; Morse & Doberneck, 1995; Nekolaichuk et al., 1999), fortune or fate (Anderson et al., 2016; Day & Maltby, 2005; Sarofim, 2016; Schactel, 1959), and other external domains. Similarly, theory and

literature on hope have often presented it as an affective state (Averill et al., 2012; Cheavens & Ritschel, 2014; Grewal & Porter, 2007; Lazarus, 1991, 1999a; Lazarus & Lazarus, 1994; Sarofim, 2016). For instance, affective elements of hope may be critical for informing cognitive appraisals related to goal pursuit, such as one's valuing and prioritizing of goals, one's perceived capability of achieving goals, appropriateness of environmental conditions for goal pursuit, and one's current success in achieving desired outcomes (e.g., Aspinwall & Leaf, 2002; Carver & Scheier, 1990a, 1990b). For example, if individuals experience greater positive emotions — such as enthusiasm, joy, or elation — and lesser negative emotions — such as anxiety or trepidation — they may be more likely to appraise themselves as capable of achieving desired outcomes (i.e., agency). In addition to providing information, the positive affectivity of hope may serve a crucial reinforcing function, motivating continued effort even in the face of setbacks or difficulty (Aspinwall & Leaf, 2002). Accordingly, there is some support for conceptualizing hope as a relatively stable (Snyder et al., 1991) cognitive and affective extension of optimism (i.e., reflecting positive cognitive schemas and positive emotionality relating to internal or external domains); in turn, these elements of hope may be applied to specific situations and events (Snyder et al., 1996), manifesting as positive future thinking and other outcomes.

Finally, the proposal that positive future thinking is a specific, cognitive manifestation of hope and optimism — and is a narrower, more mutable construct than these underlying cognitive schemas and affective predispositions — is likewise consistent with existing research. Although this model as applied to optimism, hope, and positive future thinking remains severely understudied, a similar pathway may be seen in related literatures. Consider, for instance, that the fairly stable and enduring personality trait of neuroticism (Nivard et al., 2015; Wray et al., 2007) has been found to predict certain cognitive schemas (e.g., negative intra- and interpersonal

schemas; Bradley et al., 1993; Martin, 1985; Muris, 2006; Otani et al., 2020; Sava, 2009; Shojaati et al., 2019; Thomson, 2016; Valikhani et al., 2017) and negative affectivity (Otani et al., 2020; Robinson et al., 2007), which in turn have been found to predict specific negative thoughts (Calvete et al., 2013; Kelly & Shin, 2009; Peixoto & Nobre, 2017; Ruiz & Odriozola-González, 2016; Wong, 2008). In the same way, the fairly stable, enduring trait of optimism (Atienza et al., 2004; Carver et al., 2010; R. E. Lucas et al., 1996; Matthews et al., 2004; Renaud et al., 2018; Scheier et al., 1994; Scheier & Carver, 1985) may predict certain cognitive schemas (e.g., positive intra- and interpersonal schemas related to ability, social support, luck, etc.; Anderson et al., 2016; Bernardo, 2015; M. W. Gallagher & Lopez, 2009; Kelberer et al., 2018; Shorey et al., 2007; Snyder, 1994; Williams, 2001), which in turn may predict specific thoughts (e.g., positive future thinking; Bryant & Ellard, 2015). The proposal that optimism reflects a more general and enduring trait, which may manifest as positive future thought (perhaps mediated by hopeful cognitive schemas), is supported by Scheier, Carver, and Bridges' (2001) definition of optimism. Namely, they describe optimism as the degree to which one expects future outcomes to be good; they further write, "Expectancies that are generalized — expectancies that pertain more or less to the individual's entire life space — are what we mean when we use the term optimism" (Scheier et al., 2001, p. 190). This would suggest that optimism is both fairly broad, stable, and trait-like *and* likely to affect thoughts related to anticipation of specific positive future events. Given the reviewed support for positioning hope within optimism broadly, there is also reason to believe that the cognitive and affective elements of hope may bridge this effect, contributing to one's positive future thinking in a given moment. For instance, individuals who are hopeful — or who hold schemas that incline them to view internal or external factors as favorable for achievement of goals or desired outcomes (Anderson et al.,

2016; Bernardo, 2010, 2015; Snyder, 1994, 2000a) — are more likely to believe that positive experiences *will* occur in the future (Bryant & Ellard, 2015; Thimm et al., 2013); the “lens” of hope shapes the view. Indeed, participants assigned to an intervention aimed at enhancing perceived agency and ability to flexibly respond to setbacks (e.g., agency and pathways components of hope) were found to have significantly greater positive future thought at the end of treatment than those assigned to standard cognitive behavioral therapy (Vilhauer et al., 2013). In other words, interventions which target elements of hope appear to result in greater positive future thought, suggesting that the former may beget the latter. Similarly, hope has been found to predict other types of positive future cognitions, such as positive problem solving orientation, or cognitions related to one’s ability to overcome future problems or obstacles (E. C. Chang, et al., 2013). Further, in their review of the literature, Elliott and Olver (2002) point to positive future thinking as a key manifestation of hope. Thus, there exists moderate support for the proposal that hope may contribute to positive future thinking. Importantly, empirical research supports considerable changes in positive future thinking over time and in response to intervention (e.g., Boselie et al., 2014; Hanssen et al., 2013; Huffman et al., 2014; Lavender & Watkins, 2004; MacLeod et al., 1998; Meevissen et al., 2011; O’Connor & Williams, 2014; M. L. Peters et al., 2010; Vilhauer et al., 2013; Williams et al., 2008), suggesting that it may be a less stable, more specific counterpart to the relatively fixed constructs of optimism and hope. In summary, while the literatures on optimism, hope, and positive future thinking have remained largely independent of one another, the constructs appear nonetheless to be closely related. In particular, there is support for a framework whereby optimism represents a broad, general, and stable personality trait, which facilitates the development of hopeful cognitive schemas and positive (“hopeful”) emotionality; when applied to specific events, this may manifest as positive future

thinking. Given that this latter construct is amenable to change, particularly relative to optimism or hope (Carver et al., 2010; Espinoza et al., 2017; Marques & Gallagher, 2017; Renaud et al., 2018; Snyder et al., 1991; Valle et al., 2006), positive future thinking may be a promising target for intervention in response to otherwise demoralizing life circumstances. Indeed, theory supports that positive future thinking may be highly protective in the face of adversity.

Positive future thinking may be protective to the degree that it facilitates greater belief in one's ability to bring about positive future experiences. Just as Ajzen (1991) proposes that perceived behavioral control — or beliefs about one's ability to competently engage in a behavior — can increase intentions to engage in that behavior, positive future thinking may make individuals believe that they or their environments are well-positioned to bring about positive future outcomes, and may accordingly increase intentions to make progress towards these outcomes. Beyond this possibility, bringing to mind positive future thoughts may also make coping with and persisting through a current negative life event more bearable, because the individual anticipates eventual amelioration of suffering and accumulation of meaningful, pleasurable experiences via these positive future events; Aspinwall (2005, p. 206) writes that positive future thinking “may be associated with good mental and physical health outcomes even in highly challenging situations and... may serve to keep people constructively engaged with important outcomes even in situations marked by low levels of personal control.” This is not unlike one's reasons for living (e.g., Linehan, 1993). To this end, it is possible that positive future thinking does not affect what a negative life event means for one *currently*, so much as it affects what the negative life event means for one's *future* (e.g., Aspinwall, 2005; Boyraz & Lightsey Jr, 2012; Carver & Scheier, 2017; Zimbardo & Boyd, 1999). This conceptualization of positive future thinking is likewise supported in theories of suicide.

As with the literature on perfectionism, theoretical support for positive future thinking again may be drawn from theories of suicide. Namely, Baumeister's theory specifically cites disengagement from the future as a proximal precipitating factor to suicidal crisis (1990). As reviewed, the pathway begins when an individual confronts a negative life event appraised as falling short of standards, which in turn leads to extreme negative affect; in an effort to escape this aversive affect, the individual enters a state that Baumeister terms "cognitive deconstruction." That is, the individual neglects higher meaning, goals, and values in favor of a "low level" present-focused awareness. This state may succeed in preventing aversive comparison of the self with important standards (essentially precluding self-regulation towards long-term goals; e.g., Bandura, 1991), but comes at the cost of positive future thoughts and expectancies. As Baumeister writes, "There is no sense that things will get better and no meaningful sense of how to resume life in a positive, happy fashion" (1990, p. 92). Thus, the absence of positive future thought may actually potentiate the effects of negative life events appraised as falling short of standards. Similarly, Williams's Cry of Pain model of suicide (1997, 2001) proposes that the extent to which negative life events will lead to a state of "arrested flight" or extreme demoralization depends on the presence of rescue factors, of which positive future thinking is a part (e.g., O'Connor et al., 2007b; Rasmussen et al., 2010). That is, an individual may encounter negative life events which are especially stressful, or which bring about a state of defeat, loss, or rejection. However, so long as the individual has hope that things will get better (in other words, that there is a "light at the end of the tunnel"), extreme demoralization and entrapment are not expected to occur. There exists well-developed empirical support for these proposals.

Across studies, positive future thinking has been found to predict greater resilience and fewer maladaptive outcomes. For instance, greater positive future thought has been found to predict greater well-being (MacLeod & Conway, 2007). Likewise, the presence of positive future thinking may be more protective against hopelessness than the absence of negative future thinking (Hunter & O'Connor, 2003; MacLeod et al., 1997b, 2005; MacLeod & Cropley, 1995; R. C. O'Connor et al., 2000, 2004). In contrast, lower positive future thought may be associated with greater symptoms of posttraumatic stress disorder (Kleim et al., 2014), depression (Bjärehed et al., 2010; Kosnes et al., 2013; Lavender & Watkins, 2004; MacLeod & Salaminiou, 2001; Morina et al., 2011; Sarkohi, 2011; Stöber, 2000), and borderline personality disorder (MacLeod et al., 2004), including in longitudinal analyses (Miranda et al., 2008). Positive, but not negative, future thinking has further been found to discriminate individuals with borderline personality disorder from those with no or subclinical symptoms (MacLeod et al., 2004). Similar findings emerge with regards to suicidality; Macleod et al. (1993, 1997b, 1998) and others (Conaghan & Davidson, 2002; Hunter & O'Connor, 2003; MacLeod & Conway, 2007) have found that individuals recently hospitalized for a suicide attempt have lower positive future thinking than matched controls, but do not differ on negative future thinking. In longitudinal studies of individuals with a history of repetitive self-harm, greater positive future thinking at the time of hospital discharge has been found to predict decreased hopelessness and suicidal ideation over a two-month follow-up period (O'Connor et al., 2007b) and may predict lower likelihood of subsequent suicide attempts over a 15-month follow-up period (O'Connor et al., 2015). Indeed, in individuals with a recent suicide attempt, lower positive future thinking may be more predictive of subsequent suicidal ideation over a two-month period than global hopelessness

(O'Connor et al., 2008). Thus, positive future thinking may enhance resilience broadly; although understudied, it may also do so in the face of negative life events.

Research is lacking on the potential protective role of positive future thinking in the context of adversity; nonetheless, research does exist to support a protective effect of the reviewed related constructs of optimism and hope. Specifically, hope may be protective against depressive symptoms in the face of negative life events (Visser et al., 2013). Hope may further uniquely predict prospective well-being in the face of negative life events, even when considered alongside related factors such as grit, meaning in life, gratitude, and others (Goodman et al., 2017). With consideration to negative performance feedback events in particular, research has found a protective effect for optimism (Blackler, 2011). Importantly, positive future thinking may be the manifestation of optimism most relevant to this effect. Kleiman et al. (2017) examined the role of various manifestations of optimism (e.g., positive future thinking, a positive inferential style, sense of invulnerability, and overconfidence) in protecting against the effects of negative life events on prospective depressive symptoms over a six-month follow-up; only positive future thinking was found to be protective in this relationship. Consistent with this, positive future thinking has been found to attenuate the relationship between the occurrence of stressful events and hopelessness (O'Connor et al., 2004). Thus, although understudied, preliminary research does suggest that positive future thinking may be a protective factor relevant to resilience.

Positive future thinking may enhance resilience through its effect on distal *consequences* of negative life events, rather than any effects on immediate behavioral responding. This remains severely understudied; nonetheless, related theoretical and empirical work supports this proposal. Specifically, self-regulation theories (e.g., Bandura, 1991; Carver & Scheier, 1990b) posit that



responses (e.g., affective, cognitive, or physical responses) to life events and other stimuli reflect assessments of immediate, in-the-moment progress towards goals, such that discrepancy can be noted and reduced. To this end, whereas perfectionism may be quite relevant — given its implications for appraisals of goals, standards, and discrepancy — positive future thinking would not be theorized to influence perceptions of in-the-moment goal attainment, and would therefore be unlikely to affect immediate behavioral responses. Similarly, Sweeny’s (2008) Crisis Decision Theory proposes that immediate responses to negative life events involve cognitions related to the life event itself, rather than cognitions related to future events; namely, she proposes that behavioral responses to negative life events reflect appraisals of the severity of the event (similar to evaluation of discrepancy in self-regulation theories) and identification and evaluation of possible response options. Further, models of meaning-making (C. L. Park, 2010) suggest that negative life events must first be assigned situational meaning (or the meaning of the specific event in the context of one’s immediate goals and environment) before being considered in the context of global meaning (or the meaning of the event in the context of more abstract and enduring future goals or experiences). In this way, numerous theories suggest that immediate responses to negative life events tend to be centered in the present moment, with attention to the life event itself; the individual is concerned with what the life event means for immediate goal-directed-behavior. More abstract cognitive processes, such as placing the event in the context of positive future experiences or one’s global sense of meaning, are theorized to occur only after the event has initially been appraised and processed (C. L. Park, 2010). As suggested, then, positive future thought may be unlikely to affect immediate behavioral responding to negative life events, but may instead affect the more distal *consequences* of both the negative life event and these immediate responses. Empirical work likewise supports this postulation. For example, Metalsky

et al. (1987, 1993) considered both immediate reactions and more enduring consequences of the negative life event of receipt of a poor grade. Participants' thoughts about what the event might mean for their future did not significantly affect their immediate reactions, but did predict enduring depressive mood (i.e., the consequence of the negative life event).

In summary, positive future thinking, or the belief that specific good outcomes will occur in one's future, is theoretically (Aspinwall, 2005; Baumeister, 1990; Williams, 1997, 2001) and empirically (e.g., Kleiman et al., 2017; R. C. O'Connor et al., 2004; Visser et al., 2013) related to resilience in the face of negative life events. Positive future thinking may be protective to the extent that it gives the individual something to look forward to, or a reason to persevere in the face of adversity (Aspinwall, 2005; Linehan, 1993). While this is understudied in relation to negative performance feedback events specifically, there is some evidence to suggest a buffering effect by the related construct of optimism (Blackler, 2011). Thus, both perfectionism and positive future thinking may represent important antecedents to resilience in the face of performance feedback events; that is, these are qualities that the individual may bring into the negative life event itself which may meaningfully influence subsequent trajectories of functioning. While positive future thinking appears to primarily impact what a negative life event means for one's future, perfectionism may be particularly likely to impact internal and external responses to the negative life event in the present moment.

### ***Resilience Behaviors***

In addition to the factors that an individual *brings into* a negative life event or other adversity, resilience also reflects how an individual responds *during* the event, which may be influenced by these antecedents, the negative life event itself, and other factors. In other words, resilience behaviors are those internal and external responses to the negative life event which

may ultimately lead to more or less adaptive consequences and trajectories. These resilience behaviors may be overt and visible or more covert and internal.

**Overt Resilience Behaviors.** Specific overt behavioral responses, reflecting both inter- and intrapersonal strategies, may be associated with more adaptive outcomes in response to negative life events. Regarding interpersonal behaviors, utilizing environmental/practical resources (Alsharaydeh et al., 2019; Barbarin, 1993; Boeck & Fleming, 2011; G. A. Bonanno et al., 2007; Distelberg & Taylor, 2015; Jaffee et al., 2007; Marriott et al., 2014; Masten et al., 2004; Murray Nettles et al., 2000; Sippel et al., 2015; Southwick et al., 2014) and social support systems (e.g., G. A. Bonanno et al., 2007; P.-J. Chang & Yarnal, 2018; Dong et al., 2017; Hawken et al., 2019; Horton & Wallander, 2001; Mo et al., 2014; Ozbay et al., 2007, 2008; Sippel et al., 2015; Wilks, 2008; Wilks & Spivey, 2010; Yang et al., 2018) tends to be associated with greater resilience. Regarding intrapersonal behaviors, effective coping and problem solving responses have been found to be robustly associated with more resilient trajectories (Aldao et al., 2010; Asgharpour et al., 2016; Baratta & Maier, 2019; G. A. Bonanno et al., 2011; Clauss-Ehlers, 2008; Coşkun et al., 2014; Fayyad et al., 2017; Kay, 2016; Mancini et al., 2012; Mancini & Bonanno, 2012; Marriott et al., 2014; Masten et al., 2004; Pinar et al., 2018; Plexico et al., 2019; Rutter, 1981, 2007; Tenhula et al., 2014; Troy & Mauss, 2011; Tugade & Fredrickson, 2007; Zolkoski & Bullock, 2012). Outcomes may also reflect more covert resilience behaviors.

**Covert Resilience Behaviors.** In addition to utilization of resources and overt coping responses, internal processes related to attention and cognition may likewise influence resilience. For instance, whether the individual attends to the negative life event, or even defines it as such, may influence its subsequent effects; substantial research suggests that attentional biases (e.g., towards positive versus negative stimuli) are associated with better mental health outcomes (Dai

& Feng, 2011; Fritzsche et al., 2010; Gotlib et al., 2004; Kellough et al., 2008; Mathews et al., 1996; McCabe & Gotlib, 1995; Oehlberg et al., 2012; Peckham et al., 2010; Platt et al., 2017; Wells & Beevers, 2010). In a similar way, cognitive processes (e.g., more balanced thinking rather than cognitive distortions or biases) may affect consequences of the negative life event (Garnefski et al., 2017; Girz et al., 2017; Kraaij et al., 2002; Lewinsohn et al., 2001; Losiak et al., 2019; Mac Giollabhui et al., 2018; Metalsky et al., 1982; A. B. Miller et al., 2017), a proposal further supported by the effects of such processes on mental health and related outcomes broadly (Alloy et al., 2011; Beevers et al., 2019; Caouette & Guyer, 2016; Ciccarelli et al., 2017; Everaert, Grahek, et al., 2017; Everaert, Podina, et al., 2017; Fazakas-DeHoog et al., 2017; Garnefski et al., 2001; Hallion & Ruscio, 2011; Menting et al., 2017; Platt et al., 2017; Quigley et al., 2019; Rnic et al., 2016; Rude et al., 2003; Schluter et al., 2019; Strohmeier et al., 2016; Tomlinson, 2019). To this end, individuals may employ internal emotion regulation strategies, such as distraction or reappraisal (Eisenberg et al., 2004; Herwig et al., 2010; Phillips & Power, 2007; Scheibe et al., 2015) to enhance resilience. Indeed, appraisals may be particularly important in determining consequences of negative life events.

The way in which an individual appraises a negative life event may be an especially influential covert resilience behavior, for several reasons. First, cognitive appraisals often affect, and precede, other responses. Rutter (1981, p. 329) specifically stated “stress responses must be viewed in terms of a transaction between an individual and his environment with the meaning and appraisal of the event intrinsic to its definition.” In arguing for the central role of cognitive appraisals, Rutter largely drew on Lazarus’s Appraisal Theory (e.g., Lazarus, 1999b; Lazarus & Launier, 1978), reviewed earlier, which proposes that an individual’s response to an event depends on one’s appraisals with regards to implications for the self, coping ability, and other

domains. Numerous other theories also posit that behavioral responses first depend on cognitive appraisals of the event (e.g., Beck, 1964; Foa & Rothbaum, 1998; Folkman & Lazarus, 1984; Resick & Schnicke, 1993). Second, cognitive appraisals are not dependent upon external access to resources. That is, while access to social support or practical resources may mitigate the effects of negative life events, these factors may be less mutable than appraisals, which are fairly amenable to change (Didymus & Fletcher, 2017; Hallion & Ruscio, 2011; Jones & Sharpe, 2017; Sears & Kraus, 2009; Shirk et al., 2013; Woby et al., 2004). Even in those instances when individuals *can* meaningfully affect their own access to social support or community resources, the process of improving these networks may take considerable time and energy (Desmond, 2016; Temin, 2017). Further, improving resources in one domain (e.g., educational, financial, housing, childcare, social support) may be less likely to have a universally protective effect against all negative life events than would improving adaptive appraisal processes. This may be particularly true for negative life events involving performance feedback specifically; even with a plethora of resources, an individual may still be vulnerable to the theorized mechanisms of these events (e.g., perceived self-discrepancy). Finally, appraisals represent a resilience behavior which may be implemented covertly, quickly, and in the moment. An individual may reappraise a negative life event without requiring access to additional materials and without drawing attention to oneself, making it an appealing resilience behavior. Again, this may be especially relevant to performance feedback events, as these events may more commonly occur in the presence of (often important) others. In summary, then, appraisals present as an accessible, broadly relevant point of intervention which may meaningfully influence consequences of negative life events. To this end, certain appraisals may be more positive and adaptive than others.

A resilient response would be a positive, or at least neutral appraisal of the negative life event. In reviewing the cognitive mechanisms of negative life events broadly, it was proposed that negative life events may bring about maladaptive outcomes through their effects on situational appraisals, which in turn may affect global beliefs, about the world and oneself (C. L. Park, 2010; C. L. Park et al., 2012; C. L. Park & Folkman, 1997). With regards to worldview, a more resilient appraisal would be one which positively, or neutrally, affects beliefs related to benevolence, meaningfulness, predictability, control, or other domains (e.g., Epstein, 1991; Janoff-Bulman, 1989, 1992; Janoff-Bulman & Frieze, 1983; C. L. Park & Folkman, 1997; Schwartzberg & Janoff-Bulman, 1991; Windsor et al., 2008). With regards to the individual, a more resilient appraisal would likewise be one which has positive or neutral implications for beliefs about vulnerability (Janoff-Bulman & Frieze, 1983), blame (Garnefski et al., 2001; Janoff-Bulman, 1989; Koss & Figueredo, 2004), and status, in one's own and others' eyes (e.g., Myers et al., 1972), among other self-beliefs. The proposed mechanism of negative performance feedback events specifically — namely, of appraisals of falling short of standards — would be included in these self-beliefs. Thus, as suggested by the reviewed theory (e.g., Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987), and empirical literature (e.g., Bender, 2020; Berke et al., 2017; Besser et al., 2004; Cianci et al., 2010), a resilient response would be one in which the individual does not appraise a negative performance feedback event as evidence of falling short of personal standards. In this way, resilience behaviors, including appraisals of negative life events, may meaningfully impact the consequences of these events.

### ***Consequences of Resilience***

If antecedents to resilience reflect those qualities that the individual *brings into* a negative life event, and resilience behaviors reflect the actions of the individual *in the face* of a negative

life event, consequences of resilience reflect the *result* of a negative life event. Indeed, this is arguably the prototypical definition of resilience; resilience is a resilient outcome (Fletcher & Sarkar, 2013). As reviewed, this may depend on the population of interest (e.g., a resilient outcome may be defined as strong academic achievement in school children versus absence of psychopathology in survivors of assault, etc.; Fletcher & Sarkar, 2013; Luthar, 2006; Luthar et al., 2000). Thus, there is no one definition of resilient consequences in response to negative life events. Nonetheless, this is often considered to take the form of greater well-being (G. A. Bonanno, 2005; Cosco et al., 2017; Downie et al., 2010; Fletcher & Sarkar, 2013; Goodman et al., 2017; Ritchie et al., 2014; Rutter, 2006a, 2012, 2013; Tonkin et al., 2018) and lesser maladaptive behavioral, physical, cognitive, and emotional outcomes (e.g., demoralization or the avoiding thereof; G. A. Bonanno, 2004, 2005; Coifman & Bonanno, 2010; Kleiman et al., 2013; Kleiman & Beaver, 2013; Rutter, 1987, 2000, 2006a). Regarding negative performance feedback events, resilience against demoralization may be the central concern.

Though understudied, there is growing support for the role of negative performance feedback and appraisals of falling short of standards in bringing about a state of demoralization. Indeed, demoralization has been defined as a veridical or perceived inability to meet one's own or others' expectations for coping with recent internal or external adversities (Frank, 1961, 1986), with this failure to cope experienced as so aversive as to engender or exacerbate a sense of profound hopelessness, subjective incompetence, defeat, lack of meaning, and, at the extreme, existential crisis (Kissane, 2004; Kissane et al., 2001, 2004). To this end, perceived failure to meet performance expectations and appraisals of falling short of standards appear closely related to the construct of demoralization. This would be highly compatible with Baumeister's reviewed Escape Theory of Suicide (1990), which posits that negative life events appraised as falling short

of standards lead to a state of *extremely aversive negative affect*, which in turn leads to a desire for escape through suicide. Conferring more direct support, both Williams's Cry of Pain Model of Suicide (1997, 2001) and O'Connor's IMV model (2011) propose that negative life events may lead to suicidal ideation through a pathway of feelings of *demoralization, defeat, and entrapment*. While unstudied in relation to performance feedback events specifically, there exists empirical support for a relationship between negative life events broadly and demoralization (Bender, 2020; Evans et al., 1987; Lennon et al., 1990; Rafanelli et al., 2005; Shrout et al., 1989; Tein et al., 2000), as well as the relationship between appraisals of falling short of standards and demoralization (Bender, 2020). Concerningly, there likewise exists empirical support for a relationship between demoralization and both suicidal ideation and risk for suicide (Anestis et al., 2018; Clarke et al., 2005; Fang et al., 2014; Kissane, 2004; Lau et al., 2010; Vehling et al., 2017). Thus, it may be of paramount importance to identify those factors associated with greater or lesser resilience in the face of negative performance feedback events.

As stated, some antecedents may particularly affect resilience behaviors, with implications for the consequences of negative life events; in considering negative life events involving performance feedback specifically, the reviewed theoretical and empirical research supports a distinct role of antecedent perfectionism in affecting the resilience behavior of appraisals. That is, perfectionism may make one especially likely to appraise negative performance feedback events as instances of falling short of standards (e.g., Burns, 1980; Frost et al., 1993; Hewitt & Flett, 1991b; Sherry et al., 2016; L. Taylor, 2020; Trumpeter et al., 2006), and the degree to which both the event and these appraisals lead to feelings of demoralization may depend on one's level of perfectionism (Bender, 2020; Wetherall et al., 2018; Wyatt & Gilbert, 1998). Where perfectionism may affect what the negative life event means for one's

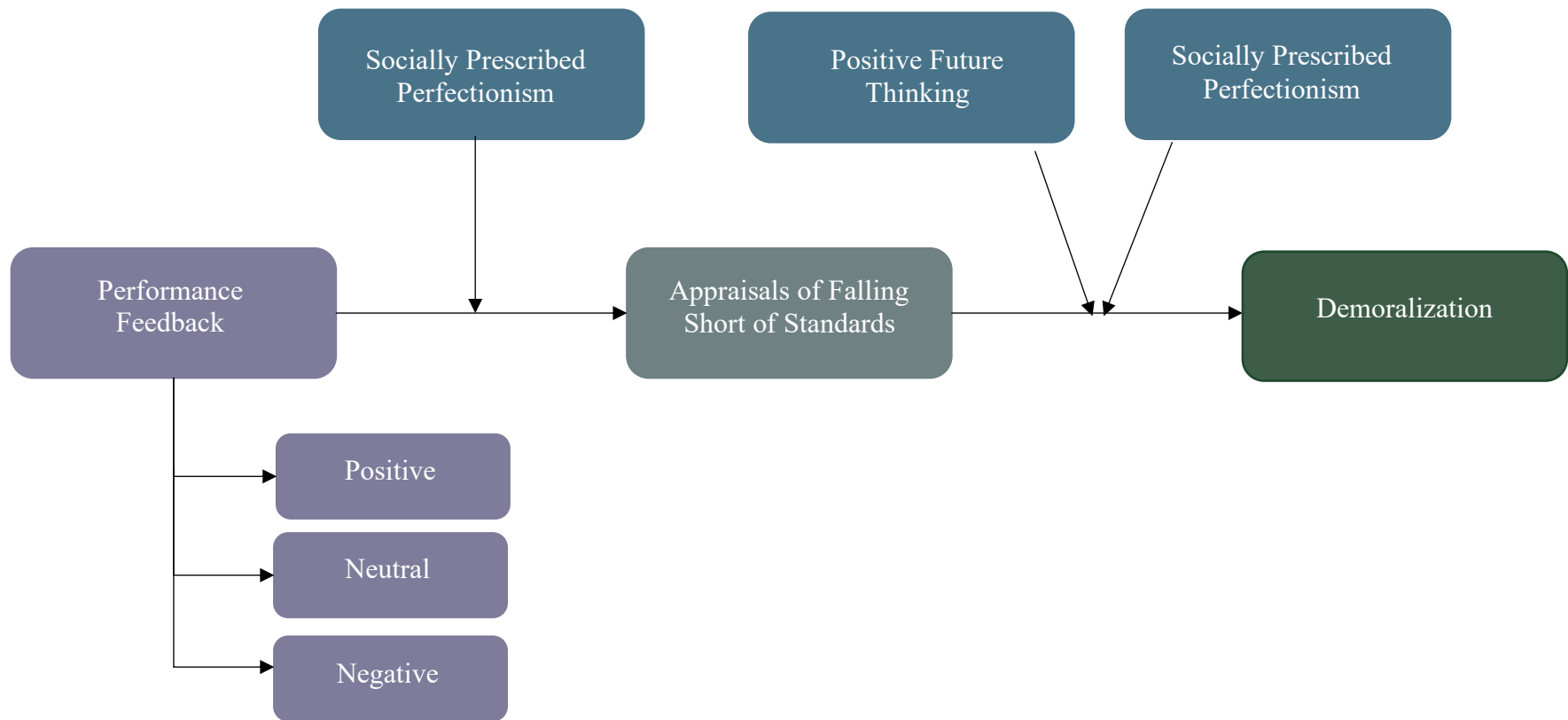


current functioning and success, antecedent positive future thinking may affect what the negative life event means for one's future. Namely, positive future thinking may attenuate the deleterious effects of negative performance feedback events and corresponding appraisals by allowing the individual to believe that things will get better — that there is a “light at the end of the tunnel” (e.g., Aspinwall, 2005; Boyraz & Lightsey Jr, 2012; Carver & Scheier, 2017; MacLeod et al., 1993, 1997b, 1998; D. B. O'Connor et al., 2007b; R. C. O'Connor et al., 2008; Rasmussen et al., 2010; Zimbardo & Boyd, 1999). Together, perfectionism and positive future thinking may present as targets for enhancing resilience in the face of negative performance feedback events.

### **Integrated Model of Exacerbating Risk and Enhancing Resiliency Factors on the Pathway from Negative Performance Feedback to Demoralization**

As indicated by the conceptual model in Figure 1, the present study proposed that negative life events involving receipt of negative performance feedback would be likely to lead to appraisals of falling short of standards, which in turn would lead to feelings of demoralization. In other words, individuals who receive negative performance feedback, relative to those who receive neutral or positive feedback, would be more likely to appraise the event as an instance of falling short of standards; this appraised discrepancy would then lead to feelings of extreme defeat, distress, and disappointment. The first step of this pathway, from negative performance feedback to appraisals of falling short of standards, is supported by the reviewed theory (Bandura, 1991; Baumeister, 1990; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987) and related empirical work (e.g., Besser et al., 2004, 2010; Cooks, 2017; Cooks & Ciesla, 2019; Stoeber et al., 2007, 2008, 2013, 2014; Stoeber & Yang, 2010). The latter step of this pathway needs additional study, but is likewise supported by preliminary theoretical (Baumeister, 1990; Frank, 1961, 1986) and empirical (Bender, 2020) literature.

However, as Figure 1 suggests, it was also proposed that the degree to which negative performance feedback would lead to appraisals of falling short of standards would depend on one's antecedent socially prescribed perfectionism, such that those with greater perfectionism would be more likely to have appraised the event in this manner (e.g., Burns, 1980; Frost et al., 1993; Hewitt & Flett, 1991b; Sherry et al., 2016; L. Taylor, 2020; Trumpeter et al., 2006). Socially prescribed perfectionism may predispose one to such appraisals, given that this dimension of perfectionism is associated with appraisals of not meeting the standards of others (Conroy et al., 2007; Flett et al., 1989, 2014; Hewitt et al., 1991; Hewitt & Flett, 1991b; O'Connor, 2011) — an association which may be heightened upon receipt of actual feedback from, and relative to, others. Further, it was proposed that the degree to which negative performance feedback and appraisals of falling short of standards would lead to demoralization would depend on both socially prescribed perfectionism and positive future thinking. Individuals with greater socially prescribed perfectionism may be more likely to care about negative performance feedback and having fallen short of standards, making both more aversive (e.g., Besser et al., 2008; Flett et al., 1994; Johnson et al., 2017; Stoeber et al., 2008, 2013; Stoeber & Yang, 2010). In contrast, positive future thinking may serve a protective function, such that the deleterious effects of appraisals of falling short of standards are mitigated by one's positive expectations for the future (e.g., Aspinwall, 2005; Boyraz & Lightsey Jr, 2012; Carver & Scheier, 2017; MacLeod et al., 1993, 1997b, 1998; D. B. O'Connor et al., 2007b; R. C. O'Connor et al., 2008; Rasmussen et al., 2010; Zimbardo & Boyd, 1999). This conceptual model is summarized in Figure 1.



*Figure 1.* Hypothesized model of the relationship between negative performance feedback (predictor) and demoralization (dependent variable) through a pathway of appraisals of falling short of standards (mediator) and dependent on socially prescribed perfectionism and positive future thinking (moderators).

## **Objectives of the Present Study**

The present study sought to clarify the unique pathway of risk posed by negative performance feedback events. This work built on a burgeoning body of literature which has attempted to disaggregate negative life events in favor of examining unique pathways and effects of specific individual life events, or types of events (Besser & Priel, 2011; Blatt & Zuroff, 1992; Dalgard et al., 2006; Holmes & Rahe, 1967; Kendler et al., 2001; Kraaij et al., 2002; R. T. Liu & Miller, 2014; Myers et al., 1972; Poulin & Silver, 2019; Sandanger et al., 2004; Smyth et al., 2008). With regards to negative performance feedback life events, theories of self-discrepancy and self-regulation suggest that their deleterious nature may reflect their effects on appraisals of falling short of standards (Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987); however, this remains unstudied. This is a notable gap, as there have been calls for greater research on the effects of negative life events on specific situational appraisals (C. L. Park et al., 2012; Steger & Park, 2012). The present study thus extended the existing literature by considering a pathway of risk unique to the negative life event in question and by testing this specific theorized relationship.

The present study further sought to conceptualize and test an integrated model by which a negative performance feedback life event may lead to maladaptive outcomes. Towards this end, the present work drew on theories of suicide (Baumeister, 1990; O'Connor, 2011; Williams, 1997, 2001) to propose that negative performance feedback events and appraisals of falling short of standards would lead to an acute state of demoralization. While there exists some empirical research on the concerning effects of negative performance feedback events in general (Anshel & Mansouri, 2005; Besser et al., 2004, 2008; Blackler, 2011; Choi et al., 2018; Cooks, 2017; Cooks & Ciesla, 2019; Frost et al., 1995; Lo & Abbott, 2019; Nease et al., 1999; Stoeber et al.,

2007, 2008, 2013, 2014; Stoeber & Yang, 2010; Van Dijk & Kluger, 2011), no known studies have examined the effects of these events on demoralization, nor have extant studies proposed or tested a model by which the maladaptive effects of performance feedback events might emerge. Even with regards to negative life events broadly, very limited research has investigated effects on demoralization or defeat; nonetheless, those studies that have tested this relationship find support (Bender, 2020; Wetherall et al., 2018; Wyatt & Gilbert, 1998). Similarly, the effects of appraisals of falling short of standards on demoralization presents as a nascent research area, with preliminary support (Bender, 2020). Further, extant studies that have manipulated performance feedback have generally neglected to include adequate levels of comparison; namely these studies have tended to only compare negative with positive feedback. Neglecting to consider neutral feedback may spuriously amplify the effects of negative feedback, as positive feedback itself may contribute to differing outcomes. Thus, this study is among the first to consider the pathway through which the effects of negative performance feedback events emerge, is the first to test if such events and associated appraisals may indeed lead to a state of demoralization, as posited by theory, and is among the first to consider across multiple levels of feedback valence.

Finally, the present study sought to identify those factors which may exacerbate risk or enhance resilience to the effects of performance feedback events specifically. By drawing on resilience literature and theory (e.g., G. A. Bonanno, 2005; G. A. Bonanno et al., 2012; G. A. Bonanno, Wortman, et al., 2002; Mancini et al., 2012; Mancini & Bonanno, 2009; Rutter, 1981, 1985a, 1987, 1999, 2006b, 2006a, 2007), this study tested antecedent individual difference factors which may affect responses to and consequences of negative performance feedback events. Although unstudied in relation to appraisals of falling short of standards and

demoralization, there does appear to be support for the proposal that the effects of negative performance feedback events are influenced by antecedent perfectionism (Anshel & Mansouri, 2005; Besser et al., 2008; Blackler, 2011; Cooks, 2017, 2017; Curran & Hill, 2018; Flett et al., 1994; Frost et al., 1995, 1997; Hewitt et al., 1989; A. P. Hill et al., 2011; Johnson et al., 2017; Lo & Abbott, 2019; Stoeber et al., 2007, 2008, 2013, 2014; Stoeber & Yang, 2010). Far less research has considered the role of positive future thinking, and, as a result, its effect on the consequences of negative performance feedback events remains unknown. Nonetheless, research on related constructs and events supports that it may meaningfully affect resilience to negative performance feedback events (e.g., Blackler, 2011; Goodman et al., 2017; Kleiman et al., 2017; R. C. O'Connor et al., 2004; Visser et al., 2013). Accordingly, the present research sought to address these gaps; doing so may have important implications, to the extent that antecedent perfectionism and positive future thinking might be targeted to enhance resilience in response to a common, perhaps even unavoidable, negative life event (Belschak & Den Hartog, 2009; G. L. Bradley et al., 2016; Finkelstein et al., 2017).

## **Hypotheses**

### ***Hypothesis 1***

It was hypothesized that participants exposed to feedback that they have fallen short of comparative standards (compared to others) on a recently completed lab task would report perceiving greater appraisals of falling short of personal standards, relative to participants who received neutral or positive feedback.

**Hypothesis 1A.** It was hypothesized that one's trait levels of socially prescribed perfectionism would moderate the association between negative performance feedback and appraisals of falling short of personal standards, such that negative performance feedback would

be increasingly related to appraisals of falling short of personal standards as individuals reported increasing socially prescribed perfectionism.

### ***Hypothesis 2***

It was hypothesized that participants exposed to feedback that they have fallen short of comparative standards would report greater scores of demoralization relative to participants who received neutral or positive feedback.

**Hypothesis 2A.** It was hypothesized that appraisals of falling short of personal standards would mediate the relationship between negative performance feedback and demoralization.

**Hypothesis 2B.** It was hypothesized that one's trait levels of socially prescribed perfectionism would moderate the association between appraisals of falling short of personal standards and demoralization, such that these appraisals would increasingly be associated with demoralization scores as participants reported increasing socially prescribed perfectionism.

**Hypothesis 2C.** It was hypothesized that one's positive future thinking would moderate the association between appraisals of falling short of personal standards and demoralization, such that these appraisals would decreasingly relate to demoralization scores as participants reported greater positive future thinking.

## Chapter 2: Methods

### Participants

In total, 347 participants were included. Sample size was determined with consideration to statistical power for detecting moderate model fit for root mean square error of approximation; this was calculated in R (R Core Team, 2020), using syntax developed by Gnambs (2019), based on recommendations in the literature (Kim, 2005; MacCallum et al., 1996, 2006). For detection of moderate model fit with power of .80 and alpha of .05, approximately 263 participants were needed. To account for missing data/attrition (anticipated to be approximately 20%; Dumville et al., 2006), an additional 53 participants were needed, resulting in a final recruitment goal of 316 participants. Participants were recruited via the University of South Florida psychology department's online SONA participant pool. Participants were not financially compensated for participation but received one point of extra credit per half hour of participation or as indicated by respective instructor policies. On average, the study took 41.27 minutes per participant to complete.

To be included in the study, participants were required to be at least 18 years of age, majoring or minoring in psychology, enrolled in a psychology course, and currently enrolled as part- or full-time undergraduate students. Additionally, participants were required to be able to read and comprehend English written language fluently, to ensure accurate completion of the study measures. A total of 419 participants were recruited. Participants were excluded if they requested their data to be withdrawn after debriefing ( $n = 3$ ; no significant differences in demographic or study variables) or if they did not pass at least four out of five attention checks



( $n = 8$ , consistent with Curran and Hauser [2019]). Participants removed for failing attention checks were compared to the full sample with respect to demographic and study variables and differed with regards to race ( $\chi^2_{(6)} = 12.82, p < .05$ ) and residence ( $\chi^2_{(3)} = 10.00, p < .05$ ). Relative to those retained, participants removed for failing attention checks were more likely to identify as Black/African American, Arabic/Middle Eastern, or as a race/ethnicity not listed. They were less likely to identify as White/Caucasian or Asian/Asian American. They were also more likely to live at home with family or to live in a residence not listed. They were less likely to live in on-campus housing. Participants removed for failing attention checks did not differ on any other demographics, nor did they differ on study variables ( $F_{(1,355)} = 1.69, p = .14$ ). An additional 61 participants were excluded for incomplete data (i.e., did not progress to performance feedback task or had greater than or equal to 50% missingness; McNeish, 2017; Strauss et al., 2003). Participants removed for incomplete data were also compared to the full sample with respect to demographic and study variables and differed with regards to ethnicity ( $\chi^2_{(1)} = 10.81, p < .01$ ), graduate school attendance intentions ( $\chi^2_{(1)} = 4.26, p < .05$ ), and relationship status ( $\chi^2_{(5)} = 25.43, p < .001$ ). Relative to those retained, participants removed for incomplete data were less likely to identify as Hispanic/Latino. They were also less likely to report intent to attend graduate school. Regarding relationship status, those removed for incomplete data were more likely to report being married or divorced and not remarried; they were less likely to report being in a non-cohabiting relationship. Participants removed for incomplete data did not differ on any other demographics, nor did they differ on study variables ( $F_{(1,363)} = 0.60, p = .62$ ). No other exclusion criteria were applied.

Participants included in the final sample had a mean age of 21.01 years ( $SD = 4.15$ ).

There was substantial skewness and kurtosis, reflecting the primary distribution in the 18-22 age

range, with fewer older participants presenting as outliers (range: 18 – 61). Participants were primarily female (84.1%). While most participants identified as heterosexual (66.6%), a considerable minority of participants identified as another sexual orientation, particularly bisexual (22.8%; see Table 1). The sample was relatively diverse with regards to race and ethnicity. Broken down by Hispanic/Latino identity (i.e., regardless of racial identities endorsed), 28.0% of the total sample identified as Hispanic/Latino. Broken down across racial/ethnic categories, 44.9% of participants identified as White/Caucasian, 25.1% identified as only Hispanic or Latino, 10.8% identified as Black or African American, 7.6% identified as Asian or Asian American, 2.0% identified as Arabic or Middle Eastern, 2.9% identified as another race or ethnicity, and the remaining 6.9% of participants identified as more than one race/ethnicity. In total, 30.5% of the participants were first-generation college students; 23.1% were freshmen, 23.3% were sophomores, 31.7% were juniors, 10.4% were seniors, and 11.5% were in their fifth year of college or greater. Participants primarily reported living in an off-campus house or apartment (47.3%), at home with family (37.7%), or in an on-campus residence hall (14.2%). Notably, most participants reported intention to attend graduate school in the future (90.8%) and had taken an introduction to psychology course (95.1%). Most had not taken the Psychology GRE (97.7%). See Table 1 for more detailed information on demographics in the present sample.

**Table 1.** Sample Demographics.

<u>Variable</u>		<u>N (%)</u>	<u>Mean</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
<u>Age</u>		345 (99%)	21.01	4.15	4.39	28.99
<u>Gender</u>	Female	292 (84%)				
	Male	48 (14%)				
	Neither	7 (2%)				
<u>Transgender</u>	No	338 (97%)				
	Yes	9 (3%)				
<u>Sexual Orientation</u>	Heterosexual	231(67%)				
	Bisexual	79 (23%)				
	Gay/Lesbian	22 (6%)				
	Asexual	5 (1%)				
	Other	10 (3%)				
<u>Race/ Ethnicity</u>	Caucasian	154 (45%)				
	Hispanic/Latinx	86 (25%)				
	Black/African American	37 (11%)				
	Asian/Asian American	26 (8%)				
	Arabic/Middle Eastern	7 (2%)				
	More than 1 race/ethnicity	23 (7%)				
	Other	10 (3%)				

**Table 1.** (Continued)

<u>Variable</u>		<u>N (%)</u>	<u>Mean</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
<u>First- Generation College Student</u>	No	241 (69.5%)				
	Yes	106 (30.5%)				
<u>Year</u>	Freshman	80 (23%)				
	Sophomore	81 (23%)				
	Junior	110 (32%)				
	Senior	36 (10%)				
	Year 5+	40 (12%)				
<u>Living Arrangement</u>	Off-Campus House or Apartment	163 (47%)				
	At Home with Family	130 (38%)				
	On-Campus Residence Hall	48 (14%)				
	Other	3 (1%)				
<u>Marital and Relationship Status</u>	Single	206 (59%)				
	In Relationship and Not Living with Partner	86 (25%)				
	In Relationship and Living with Partner	41 (12%)				
	Married	12 (4%)				
	Divorced and Not Remarried	1 (0.3%)				
	Other	1 (0.3%)				

**Table 1.** (Continued)

<u>Variable</u>		<u>N (%)</u>	<u>Mean</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
<u>Planning to Attend Graduate School</u>	Yes	315 (91%)				
	No	32 (9%)				
<u>Have Taken Introduction to Psychology</u>	Yes	330 (95%)				
	No	17 (5%)				
<u>Have Taken Psychology GRE</u>	No	339 (98%)				
	Yes	8 (2%)				

## Measures

### *Demographics*

**Demographic Questionnaire.** The present study used a demographic assessment measure (see Appendix A) to collect basic demographic data, including age, gender, sexual orientation, year in undergraduate course of study, race/ethnicity, language(s) spoken, current living arrangement (e.g., on-campus, off-campus apartment, etc.), relationship/marital status, and employment status. This measure took approximately five minutes to complete.

### *Perfectionism*

**Multidimensional Perfectionism Scale; MPS** (Appendix B; Hewitt & Flett, 1990): The MPS is a 45-item self-report measure of perfectionism, which took approximately five to ten minutes to complete. Responses are given on a 7-point Likert scale ranging from “Disagree” to

“Agree,” with greater responses indicating a greater degree of endorsement of perfectionism. The measure is comprised of three subscales, reflecting self-oriented, socially prescribed, and other-oriented perfectionism. Examples of items reflecting each dimension of perfectionism are, respectively, “I strive to be the best at everything I do,” “People expect nothing less than perfection from me,” and “If I ask someone to do something, I expect it to be done flawlessly.” A summed total score was obtained for each subscale. The scale is commonly employed in studies of perfectionism (Blankstein et al., 1993; Childs & Stoeber, 2010; J. J. Klibert et al., 2005; T. R. Martin et al., 1996; Onwuegbuzie, 2000; Roxborough et al., 2012; Sherry et al., 2004; Stoeber et al., 2009; Tissot & Crowther, 2008). The scale is accessible, requiring a Grade 6-7 reading level and has been validated for use in both clinical and community samples (Hewitt et al., 1991; Hewitt & Flett, 1991b). The self-oriented, socially prescribed, and other-oriented perfectionism subscales are reliable over time ( $r = 0.88, 0.75, 0.85$ , respectively; Hewitt & Flett, 1991b). In the present sample, the self-oriented and socially prescribed scales were included and demonstrated good internal consistency reliability, with Cronbach’s alphas of 0.92 and 0.85, respectively (Hewitt & Flett, 1991b). Convergent validity of the self-oriented perfectionism subscale is supported by its association with high standards, self-importance of performance, self-importance of goal attainment, self-criticism, and self-blame, whereas its discriminant validity is supported by a lack of association with demand for approval of others, fear of negative evaluation, authoritarianism, dominance, or other-directed blame (Hewitt & Flett, 1991b). Likewise, the socially prescribed perfectionism subscale evidences convergent validity by its association with demand for approval of others, fear of negative evaluation, social standards, and social importance of goal attainment; its discriminant validity is supported by a lack of relationship with high self-standards, authoritarianism, dominance, self-importance of

performance, or self-importance of goal attainment (Hewitt & Flett, 1991b). The MPS had 0% missingness in the present sample.

### ***Positive Future Thinking***

**Future Thinking Task; FTT** (Appendix C; MacLeod et al., 1993, 1997): The FTT is a brief task that asks participants to generate positive future scenarios they are looking forward to across three distinct time periods (i.e., within the next week including that day, within the next year, and within the next 5–10 years). Specifically, the task asks, “Try to think of as many positive future experiences, things that you are looking forward to, or things that you would enjoy, that could happen in the next week/year/5–10 years.” For each time period, participants had one minute to provide as many positive future experiences as possible; accordingly, the task took approximately three minutes to complete. Participants were instructed that these experiences should be things that they actually anticipate happening, or things that are reasonably likely to happen. Participants were also instructed to type as many positive future scenarios as come to mind, whether trivial or important, and to not stop typing until the time limit was up. To control for effects of typing speed or cognitive fluency, participants also completed a verbal fluency task (Lezak, 1976) in which they were instructed to generate and type as many words as possible that begin with a given letter (F, A, S); participants completed the task for each letter, with each trial allotted one minute. This is consistent with prior studies employing the FTT (e.g., Hunter & O’Connor, 2003; O’Connor et al., 2015). Given that research suggests no significant effect of time period on number of positive future thoughts generated (e.g., Goodby & MacLeod, 2016; MacLeod et al., 1993, 1997b; O’Connor et al., 2004), the number of positive future thoughts across time periods was summed, producing a total positive future thinking score. This task is the predominant operationalization of positive future thinking

in the literature (e.g., Bjärehed et al., 2010; Daniel et al., 2013a, 2013b, 2015; Hunter & O'Connor, 2003; Lavender & Watkins, 2004; MacLeod et al., 1997, 1998, 2004, 2005; MacLeod & Conway, 2007; MacLeod & Salaminiou, 2001; R. C. O'Connor et al., 2000, 2004, 2015; Sarkohi, 2011; Sarkohi & Andersson, 2011). Concurrent validity of the task is supported by its demonstrating expected relationships with well-being, depression, borderline personality disorder, hopelessness, suicidal ideation, suicide intent, and suicide attempt history (Bjärehed et al., 2010; Hunter & O'Connor, 2003; Lavender & Watkins, 2004; MacLeod et al., 1997b, 1998, 2004, 2005; MacLeod & Conway, 2007; MacLeod & Salaminiou, 2001; R. C. O'Connor et al., 2000, 2004, 2015; Sarkohi, 2011). In addition, the task is supported by research finding a relationship between task scores of positive future thinking and hopelessness after controlling for depression (MacLeod et al., 2005; R. C. O'Connor et al., 2000); similarly, task scores of positive future thinking predict suicide attempt status after controlling for hopelessness, depression, and anxiety (Hunter & O'Connor, 2003). Predictive validity of the task is supported by its demonstrating expected relationships with subsequent suicide attempts (R. C. O'Connor et al., 2015). In the present sample, the FTT had 4.90% missingness ( $n = 17$ ). Specifically, 15 participants (4.32%) did not respond to one time period, one participant (0.29%) did not respond to two time periods, and one participant did not respond to any of the three time periods.

### ***Appraisals of Falling Short of Standards***

**Appraisal Scale; AS** (Appendix D): The AS is a 3-item self-report measure of appraisals of falling short of standards drawn and adapted from Smith and Lazarus's (1993) larger *Scale for Assessing Appraisal Components* and other similar measures (e.g., Bissell & Rask, 2010; Heidrich, 1994, 1999). Adaptations to the scale were guided by previously collected data (Bender, 2020). The three items asked, "To what extent did the results of this event fall short of



your standards?”, “To what extent did the results of this event fall short of your expectations?”, and “To what extent did the results of this event fall short of your capabilities?”. Consistent with Smith and Lazarus’s (1993) larger scale, participants responded on a nine-point Likert scale, anchored from 1, “Not at all,” to 9, “Extremely much.” Consistent with prior research employing this scale, responses were summed, producing a total score (e.g., Bennett et al., 2003; Coe et al., 2015; Lowe & Bennett, 2003; C. A. Smith et al., 1993). The concurrent validity of the original scale is supported by expected associations with causal attributions (C. A. Smith et al., 1993). Concurrent and divergent validity of the original three items is supported by their specific association with the emotion of guilt and the core relational theme of self-blame, relative to other appraisal dimensions, and attenuated relationships of the three items with other emotions and core relational themes (e.g., emotions of anger, fear/anxiety, and sadness; core relational themes of other-blame, danger/threat, and irrevocable loss; C. A. Smith et al., 1993; C. A. Smith & Lazarus, 1993). Furthermore, the scale demonstrates high test–retest reliability (Bennett et al., 2003), with no significant effect of time on these three appraisals across a one-week interval. Internal consistency reliability was supported in the present sample, with a Cronbach’s alpha of 0.88. The scale took approximately three minutes to complete. The AS had 0.87% missingness, with 3 participants not completing any scale items.

### ***Demoralization***

**Demoralization Scale; DS** (Appendix E; Kissane et al., 2004): The DS is a 24-item self-report measure of feelings of state demoralization, which took approximately ten minutes to complete. Respondents use a 5-point Likert scale ranging from 0, “Never,” to 4, “All the Time,” to indicate how often in the previous two weeks they had felt various features of demoralization. The scale produces five subscales, measuring “Dysphoria,” “Loss of meaning and purpose,”

“Disheartenment,” “Helplessness,” and “Sense of failure.” Example items from each scale are, respectively, “I have a lot of regret about my life,” “My life seems to be pointless,” “I feel trapped by what is happening to me,” “I feel that I cannot help myself,” and “I am proud of my accomplishments (reversed).” The total score is produced by summing the items, and subscale scores are produced by summing the items within the subscales. In the present sample, the total score had good internal consistency reliability ( $\alpha = 0.95$ ), as did the Dysphoria ( $\alpha = 0.83$ ), Loss of meaning and purpose ( $\alpha = 0.92$ ), Disheartenment ( $\alpha = 0.90$ ), Helplessness ( $\alpha = 0.92$ ), and Sense of failure ( $\alpha = 0.79$ ) subscales (Kissane et al., 2004). There is support for concurrent validity of the scale and subscales, given their significant associations ( $p < .01$ ) in the expected directions with positive expectancies, quality of life, depression, anxiety, distress, hopelessness, and desire for death (Kissane et al., 2004; Mehnert et al., 2011; Mullane et al., 2009). Despite its association with depression, discriminant validity is nonetheless supported by research finding it to be a distinct construct when assessed alongside the Beck Depression Inventory II and the Patient Health Questionnaire (Fang et al., 2014; Kissane et al., 2004; Mehnert et al., 2011). For instance, anywhere from 60-85.2% of participants with moderate demoralization do not meet criteria for depression (Jacobsen et al., 2006; Mehnert et al., 2011). The scale is theorized to reflect a “mental state” (Kissane et al., 2004, p. 269) and this is supported by fluctuations in the scale in response to treatment and environmental factors. Specifically, the scale exhibits significant, meaningful reductions after brief psychotherapeutic interventions (Catanese et al., 2009; Marsa et al., 2017); further, scores on the scale are responsive to joblessness, cancer diagnosis, pain, and presence and severity of physical problems, including in prospective investigations (De Jong et al., 2008; Hadnagy et al., 2012; Hung et al., 2010; Lee et al., 2012; Vehling et al., 2011, 2012, 2013). Indeed, scores on the scale have been reduced by as much as

66.6% within a 24-hour period, given injection with ketamine (Zanicotti et al., 2012). Given the support for its state-like nature, and given its use as an outcome measure in the present study, the instructions and scaling of the DS were modified to match those of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). Specifically, the instructions were changed from “For each statement below, please indicate how strongly you have felt this way *over the last two weeks* by circling the corresponding number,” to “For each statement below, please indicate how strongly you *feel this way right now, that is, at the present moment*. Use the following scale to record your answers.” The scaling changed from a 5-point Likert scale ranging from 0, “Never,” to 4, “All the Time,” to a 5-point Likert scale ranging from 0, “Very Slightly or Not at All,” to 4, “Extremely.” These adaptations are consistent with prior research adapting measure scaling and instructions to correspond to a differing time period (e.g., Backholm & Björkqvist, 2012; Deater-Deckard et al., 2011; K. M. Gallagher & Updegraff, 2011; Gupta et al., 2016; Jarman et al., 2018; MacInnis & Hodson, 2012; J. M. Miller et al., 2016; Murray et al., 2001; Salim et al., 2019; Thøgersen-Ntoumani et al., 2017; Weinstein, 1980). The DS had 0.58% missingness, with 2 participants not completing any scale items.

### ***Performance Task***

**Graduate Record Exam (GRE) Psychology Test Practice Book Sample Items;** (Appendix F; Educational Testing Service, 2017): For the purpose of completing a task upon which to receive believable performance feedback, all participants completed a 20-item test composed of questions drawn from the GRE Psychology Test Practice Booklet. This is consistent with a prior study employing spurious feedback, in which participants completed a test with 20 items drawn from general GRE practice tests (Blackler, 2011). Prior research supports that performance feedback provided on tasks that purport to be predictive of cognitive

processing, intellectual ability, or academic success is believable (e.g., C. Chen et al., 2020; Hewitt et al., 1989; Lo & Abbott, 2019), evidenced by manipulation checks. Importantly, research supports that spurious performance feedback provided on GRE materials in particular is believable, evidenced by expected relationships between feedback valence and affect (Blackler, 2011). A pseudo GRE Psychology screening test was selected as the performance task because it is theorized to be more personally relevant than alternative performance tasks (e.g., anagram task, mental rotation tasks); participants were theorized to be more likely to care about their feedback on this task, and thus to be more vulnerable to demoralization. That is, since all participants were drawn from the university's psychology department SONA pool, and were psychology majors or minors, they were theorized to be likely to be invested in a test which was presented as able to "accurately measure academic functioning and predict future success in graduate school" (see Procedure section below). Prior research supports that presenting tasks as predictive of future academic success enhances their personal importance *and* that personally relevant tasks in turn increase the effects of performance feedback. For example, Hewitt et al. (1989) manipulated the "ego importance" of their performance task; one group was informed that the task was "indicative of skills required for university success," whereas the other group was informed that the task was part of the experiment and had no inherent evaluative meaning (Hewitt et al., 1989, p. 139). Participants assigned to the former task instructions rated personal importance of performing well on the task as significantly higher than those assigned to the latter task instructions. Additionally, those assigned to the former condition reported significantly greater increases in depressed mood in response to negative performance feedback, relative to those in the latter condition. Thus, a GRE Psychology screening test was chosen to increase the

personal importance of the performance task, which in turn may potentiate the effects of performance feedback on demoralization.

## **Procedure**

Participants were recruited through the University of South Florida psychology department's SONA pool. Before beginning the study, participants were first directed to the informed consent page, which detailed the background of the study, purpose, procedures, risks and benefits, participant rights, and confidentiality policies. To ensure that the study remained unbiased, participants were kept blind to the true purpose of the study. They were informed that the study was part of a larger national study examining distributions of future graduate school potential among undergraduates in colleges and universities across the United States. Participants who provided informed consent then began the study. Participants completed a demographics questionnaire, the MPS, the FTT, a measure of verbal fluency, and a baseline measure of the DS. The order of presentation of the four measures was randomized within the survey platform to reduce the chances of order effects on participant responses. When these measures were completed, participants were then told that they would complete a brief Psychology GRE screening test that has been shown to accurately measure academic functioning and predict future success in graduate school. Participants then completed the Psychology GRE practice test task within the survey platform. To ensure participants spent adequate time on the task, the option to advance the screen did not appear for six minutes; this was informed by a formula for calculating time to measure completion based on number of measure items (Bickman et al., 1999) and by pilot testing. Once participants completed the task and advanced to the next screen, they were told that their responses were being scored and compared to the average participant, consistent with prior research on performance feedback (Besser et al., 2004, 2008; Cooks, 2017;

Cooks & Ciesla, 2019; Kottman, 2017; Lo & Abbott, 2019); participants were also told that they would not be able to advance the screen until this process was complete. To allow plausible time for computer scoring of the Psychology GRE practice test, the option to advance the screen did not appear for 7 seconds; this was based on prior research indicating that computer scoring can be completed in a matter of seconds (e.g., Allard et al., 1995; Ebrahimi et al., 2019; Hasselbring et al., 1982; Khoshsima & Toroujeni, 2017; Weiner & Greene, 2017). When participants clicked to advance the screen, the survey platform randomly assigned the participant to the positive, neutral, or negative feedback condition; conditions were evenly presented such that each condition was presented an equal number of times. These conditions were adapted from those employed in prior studies, which did not include a neutral control condition (Besser et al., 2004, 2008; Lo & Abbott, 2019; Stoeber et al., 2014). In the positive feedback condition, participants advanced to a full screen with the text, “You scored above the 91st percentile. This is a very high score. Your performance is well above average. Well done!” In the neutral feedback condition, participants advanced to a full screen with the text, “You scored at the 51st percentile. This is an average score. Your performance is much like the scores of other typical psychology students.” In the negative feedback condition, participants advanced to a full screen with the text, “You scored below the 21st percentile. This is a very low score. Your performance is below average. It is recommended that you consider taking a GRE preparation course before taking the actual exam.” Supporting the validity of this manipulation, previous research suggests these and similar negative performance feedback statements are associated with greater anxiety, depression, dysphoria, anger, hostility, guilt, shame, and general negative affect, and lower pride, self-esteem, and self-ratings of positive personality attributes (Besser et al., 2004, 2008; Blackler, 2011; Curran & Hill, 2018; Lo & Abbott, 2019; Stoeber et al., 2007, 2014). After receiving

performance feedback, participants then completed the DS and then the measure of appraisal, in this order; the order of presentation of the two measures was based on feedback from pilot testing. The study took 41.27 minutes to complete on average. Participants received one extra credit point for each half hour of participation. Participants were allowed to end the study at any time without penalty. When the study was completed, three items designed to assess the effectiveness of the deception, adapted from Lo and Abbott (2019) were presented (“Please rate how positive or negative you found your feedback for your performance on the Psychology GRE screening test to be” [-5 = negative to 5 = positive], “You were provided feedback regarding your performance on the Psychology GRE screening test today. Overall, how believable did you find the feedback to be at the time it was given?” [0 = not at all to 4 = extremely believable], “Please rate how meaningful you found your feedback for your performance on the Psychology GRE screening test to be.” [0 = not at all to 4 = extremely meaningful]). Next, a debriefing page was presented to participants informing them of the true purpose of the study and the contact information of the principal investigator. Participants were asked to not reveal the study purpose to any other USF undergraduates so as not to spoil the study to other potential participants. Since this survey contained manipulation of negative performance feedback, mental health resources (including campus, community, and national resources) were provided to all participants. No identifying information was collected. All study data was stored on a secured, password protected server and was accessible only to authorized study personnel.

## **Data Analyses**

### ***Preliminary Analyses***

All analyses were conducted in the Statistical Package for Social Sciences (SPSS; IBM, 2017) version 25.0 and in R (Version 4; R Core Team, 2020). Data was screened for

missingness. Given that mediation analyses cannot accommodate multiple imputation (Hayes, 2017, 2020), missing data was handled with mean imputation. Total scores and respective subscale scores were produced for the MPS, FTT, AS, and DS by summing individual items. Higher scores indicated greater perfectionism, positive future thinking, appraisals of falling short of standards, and demoralization respectively. The relationship of the experimental condition with baseline study variables and continuous demographic variables was examined with a multiple analysis of variance (MANOVA) and follow-up ANOVAs as needed. Significant ANOVAs were probed with post hoc testing with Bonferroni correction. The relationship of experimental condition with categorical demographic variables was examined with chi-square tests of independence. The relationship of continuous demographic variables with remaining study variables were examined with correlation coefficients. The relationship of categorical demographic variables with remaining study variables were examined with MANOVAs with follow-up ANOVAs as needed. Significant ANOVAs were probed with post hoc testing with Bonferroni correction. For demographics significantly related to any study variables, primary analyses were run with and without these demographics included as covariates, to assess for impact on results. Descriptive statistics were run on demographic and study variables to characterize the sample and review means, standard deviations, and ranges of scores. The skewness and kurtosis of study variables were assessed to examine the distribution of the variables. Univariate normality and outliers were assessed visually (e.g., box plot, histogram) and statistically (e.g., Shapiro-Wilk test; Shapiro & Wilk, 1965). Multivariate normality and outliers were likewise assessed visually (e.g., quantile-quantile [QQ] plots) and statistically (e.g., Mahalanobis' Distance; Mahalanobis, 1936). For outliers identified, values were checked for accuracy of data entry. As appropriate, outliers were removed or the variable was transformed; as



needed, analyses were run with and without treatment of outliers, to assess for impact on results. Normality of residuals was examined with QQ plots. Homoscedasticity and homogeneity of variance was assessed by plotting residuals against predicted values. When heteroscedasticity was noted, the dependent variable was transformed (NIST, n.d.), and analyses were run with and without the transformed variable, to assess for impact on results. When heterogeneity of variance was noted, nonparametric tests were conducted and results of nonparametric analyses were compared to parametric tests to determine impact of heterogeneity of variance. Multicollinearity was assessed via the variance inflation factor (VIF; Marquardt, 1970). Linearity of relationships of relevant study variables was assessed visually (e.g., scatterplots) and statistically (e.g., bivariate correlations). To examine preliminary relationships of continuous study variables, Pearson correlation coefficients were produced. To examine preliminary relationships of experimental condition with continuous study variables, a MANOVA with follow-up ANOVAs was run. Internal consistency reliability in the present sample was assessed as relevant with Cronbach's alpha.

### ***Hypothesis Testing***

**Hypothesis 1.** To test Hypothesis 1, an ANOVA was run, with experimental condition entered as the independent variable and appraisals of falling short of standards entered as the dependent variable. The  $p$ -value and test statistic were examined for significance and magnitude of an effect.

**Hypothesis 1A.** To test Hypothesis 1A, a nested (hierarchical) ANOVA was run, consistent with recommended procedures (Baron & Kenny, 1986; Holmbeck, 1997). Before interaction effects were tested, component variables were mean-centered (Aiken & West, 1991). In the first step, experimental condition and the proposed moderator of socially prescribed

perfectionism were entered as predictors of appraisals of falling short of standards. In the second step, the interaction term, representing the interaction between experimental condition and perfectionism, was entered. Support for an interaction effect was determined by examining the significance of the interaction term and determining if the new model explained significantly more variance in appraisals of falling short of standards than the model without the interaction effect.

**Hypothesis 2.** To test Hypothesis 2, an ANOVA was run, with experimental condition entered as the independent variable and residualized demoralization entered as the dependent variable. The *p*-value and test statistic were examined for significance and magnitude of an effect.

**Hypothesis 2A.** To test Hypothesis 2A, bootstrapped samples were used, consistent with Preacher and Hayes (2004). Specifically, mediation was tested using the *lavaan* package in R (Rosseel, 2012). This generated a bootstrapped point estimate and confidence intervals for the mediation effect. Experimental condition was entered as the independent variable (with the positive feedback condition dummy coded as the reference group), residualized demoralization was entered as the dependent variable, and appraisals of falling short of standards were entered as the mediator. Mediation was considered tenable if zero did not fall within the bounds of the bootstrapped confidence intervals for the indirect effect.

**Hypothesis 2B.** To test Hypothesis 2B, a hierarchical regression was run, consistent with recommended procedures (Baron & Kenny, 1986; Holmbeck, 1997). Prior to analyzing interaction effects, the independent variable and proposed moderator were mean-centered (Aiken & West, 1991). In the first step, appraisals of falling short of standards and the proposed moderator of socially prescribed perfectionism were entered as predictors of residualized

demoralization. In the second step, the interaction term, representing the interaction between appraisals of falling short of standards and perfectionism, was entered. Support for an interaction effect was determined by examining the significance of the interaction term and determining if the new model explained significantly more variance in demoralization than the model without this effect.

*Hypothesis 2C.* To test Hypothesis 2C, a hierarchical regression was run consistent with recommended procedures (Baron & Kenny, 1986; Holmbeck, 1997). Prior to analyzing interaction effects, the independent variable and proposed moderator were mean-centered (Aiken & West, 1991). In the first step, appraisals of falling short of standards and the proposed moderator of positive future thinking were entered as predictors of residualized demoralization. In the second step, the interaction term, representing the interaction between appraisals of falling short of standards and positive future thinking, was entered. Support for an interaction effect was determined by examining the significance of the interaction term and determining if the new model explained significantly more variance in demoralization than the model without this effect.

### *Exploratory Analyses*

**Interaction of Self-Oriented Perfectionism and Feedback Condition on Appraisals of Falling Short of Standards.** It was possible that participants perceived the comparative performance feedback (i.e., feedback relative to others) as an indicator of their ability to meet *their own* standards of how they think they should perform relative to others, rather than an indicator of how they believe *others* think they should perform. A nested (hierarchical) ANOVA was run to test this possibility. Prior to testing moderation, self-oriented perfectionism was mean-centered. In the first step, experimental condition and the proposed moderator of self-

oriented perfectionism were entered as predictors of appraisals of falling short of standards. In the second step, the interaction term, representing the interaction between experimental condition and self-oriented perfectionism, was entered. Support for an interaction effect was determined by examining the significance of the interaction term and determining if the new model explained significantly more variance in demoralization than the model without this effect. Given support for an interaction effect, post-hoc analyses were conducted to probe this effect, using simple slopes analysis (Holmbeck, 2002) and the Johnson-Neyman technique (Johnson & Fay, 1950; Johnson & Neyman, 1936; Potthoff, 1964).

**Interaction of Self-Oriented Perfectionism and Appraisals of Falling Short of Standards on Demoralization.** Given that the present appraisals reflected appraisals of falling short of *personal* standards, it is possible that self-oriented perfectionism may uniquely have a moderating effect, rather than socially prescribed perfectionism, given that the former refers to standards *one sets for oneself*. To test this possibility, a hierarchical linear regression was run. Prior to testing moderation, the predictors, appraisals of falling short of standards and self-oriented perfectionism, were mean-centered. In the first step, appraisals of falling short of standards and the proposed moderator of self-oriented perfectionism were entered as predictors of residualized demoralization. In the second step, the interaction term, representing the interaction between appraisals and perfectionism, was entered. Support for an interaction effect was determined by examining the significance of the interaction term and determining if the new model explained significantly more variance in demoralization than the model without this effect.

**Complete Exploratory Model.** An exploratory integrated model was proposed whereby the mediational effect of appraisals of falling short of standards would mediate the relationship

between feedback condition and residualized demoralization, with the relationship between feedback condition and appraisals moderated by self-oriented perfectionism (see Figure 2). To test this exploratory integrated model, path analysis was run in R Version 4 (R Core Team, 2020) using the *lavaan* package version 0.6-8 (Rosseel, 2012). First, the model to be estimated was specified. This model was then estimated, and fit was evaluated. Specifically, the goodness of the overall model fit was evaluated using the comparative fit index (CFI), root mean square error of approximation (RMSEA), and the chi-square statistic. A nonsignificant chi-square index ( $p > .05$ ; Hu & Bentler, 1999) would suggest good fit, along with a CFI greater than 0.95 and an RMSEA of 0.05 or less (Hu & Bentler, 1999). Alongside evaluation of fit indices, the significance of path coefficients was examined to determine relationships of study variables. Modification indices were examined for any suggested model modifications, with careful consideration of theory and extant empirical research.

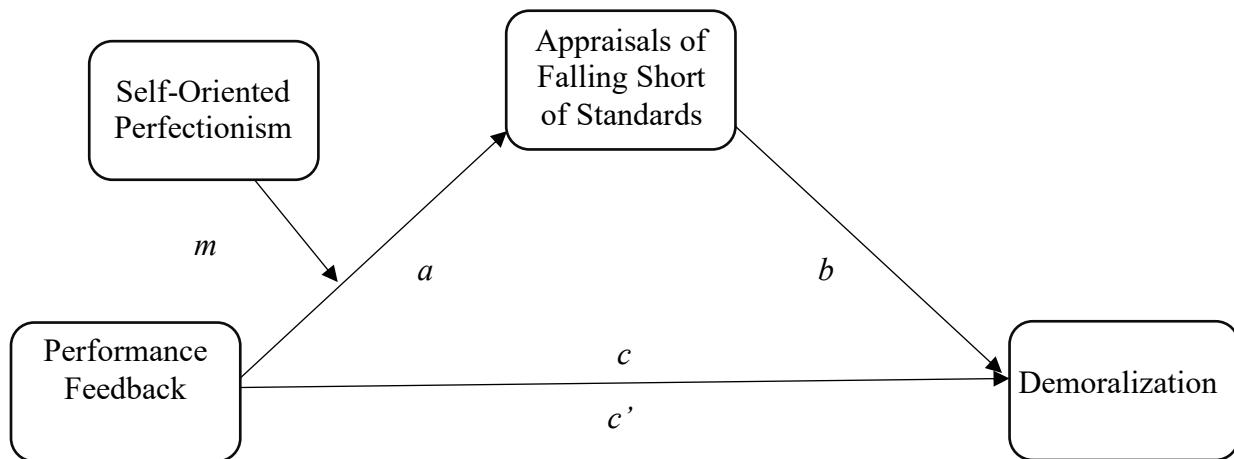


Figure 2. Proposed model of the mediated effect of performance feedback on demoralization through appraisals of falling short of standards, with moderation by self-oriented perfectionism.

## Chapter 3: Results

### Preliminary Analyses

#### *Missing Data*

Across variables, 5.76% ( $n = 20$ ) of participants had at least some missing data. Missingness was unrelated to demographic variables, with the exception of missingness for positive future thinking, which was related to race/ethnicity ( $\chi^2_{(6)} = 13.91, p < .05$ ), and missingness for demoralization, which was also related to race/ethnicity ( $\chi^2_{(6)} = 16.36, p < .05$ ) and relationship status ( $\chi^2_{(5)} = 13.38, p < .05$ ). Relative to those with complete data for positive future thinking, participants with missing values were more likely to identify as Black/African American and less likely to identify as White/Caucasian, Asian/Asian American, Arabic/Middle Eastern, or a race not listed. Relative to those with complete data for demoralization, participants with missing values were more likely to identify as a race not listed and less likely to identify as Hispanic/Latino, Black/African American, Asian/Asian American, Arabic/Middle Eastern, or Biracial/Multiracial. They were also more likely to be married and less likely to be in a relationship or divorced. Mean imputation was used to replace missing values to facilitate mediational and path analyses. While this precluded inclusion of race/ethnicity or relationship status as auxiliary variables, prior research has found that auxiliary variables improve model efficiency only under conditions in which there is substantial missing data *and* the auxiliary variables are excellent predictors of the missing values; for instance, auxiliary variables with a correlation of  $r = .40$  or less to incomplete data are considered to have no meaningful effect on model efficiency (Collins et al., 2001; von Hippel & Lynch, 2013). In the present sample

race/ethnicity had a small effect on missingness for positive future thinking ( $r = .20$ ) and demoralization ( $r = .22$ ). Similarly, relationship status had a small effect on missingness for demoralization ( $r = .20$ ). Further, both positive future thinking and demoralization had minimal missing data (4.90% and 0.58%, respectively). Importantly, race/ethnicity and relationship status were unrelated to actual values of positive future thinking or demoralization. This pattern of missingness was therefore unlikely to have meaningfully affected results.

### ***Relationship of Experimental Condition with Baseline Study Variables***

Consistent with the random assignment, experimental condition was unrelated to the baseline study variables of demoralization at time one, socially prescribed perfectionism, and positive future thinking.

### ***Relationship of Experimental Condition with Demographic Variables***

Consistent with the random assignment, experimental condition was unrelated to any demographic variables.

### ***Relationship of Continuous Study Variables with Demographic Variables***

To assess for potential confounding effects of continuous demographic variables on the remaining study variables, Pearson correlations were run. No continuous demographic variables were significantly related to study variables. To examine the effects of categorical demographic variables on the remaining study variables, a MANOVA was run with follow-up ANOVAs as needed. Significant ANOVAs were probed with post hoc testing with Bonferroni correction. Among categorical variables, gender ( $F_{(2, 344)} = 2.50, p < .01$ ), identity as transgender ( $F_{(1, 360)} = 2.57, p < .05$ ), sexual orientation ( $F_{(4, 342)} = 3.32, p < .0001$ ), and intention to attend graduate school ( $F_{(1, 345)} = 2.32, p < .05$ ) were significantly related to the study variables. Follow-up ANOVAs for the effects of gender indicated that gender predicted positive future thinking ( $F_{(2,$

$_{344} = 3.96, p < .05$ ) and socially prescribed perfectionism ( $F_{(2, 344)} = 4.56, p < .05$ ). Post hoc testing indicated that those who identified as female reported greater positive future thinking ( $M = 17.85, SD = 5.71$ ) than those who identified as male ( $M = 15.41, SD = 4.76, p < .05$ , Cohen's  $d = 0.46$ ), corresponding to a medium effect. Those who identified as neither male nor female reported greater socially prescribed perfectionism ( $M = 71.71, SD = 9.39$ ) than those who identified as female ( $M = 58.00, SD = 15.03, p < .05$ , Cohen's  $d = 1.09$ ) or male ( $M = 54.38, SD = 11.84, p < .05$ , Cohen's  $d = 1.62$ ), corresponding to large effects. These results should be viewed cautiously given the small sample size ( $n = 7$ ) of those who identified as neither male nor female. There were no other significant differences between genders in study variables. Follow-up ANOVAs for the effects of transgender identity indicated that this demographic variable predicted socially prescribed perfectionism ( $F_{(1, 360)} = 9.80, p < .01$ ). Those who identified as transgender reported greater socially prescribed perfectionism ( $M = 69.67, SD = 11.40$ ) than those who identified as cisgender ( $M = 57.46, SD = 14.66, p < .05$ , Cohen's  $d = 0.93$ ), corresponding to a large effect. This result should also be viewed cautiously given the small sample size ( $n = 9$ ) of those who identified as transgender. There were no other significant effects of transgender identity on study variables. Follow-up ANOVAs for the effects of sexual orientation indicated that sexual orientation predicted demoralization at time one ( $F_{(4, 342)} = 7.44, p < .0001$ ) and demoralization at time two ( $F_{(4, 342)} = 3.03, p < .05$ ). Post hoc testing indicated that, at time one, those who identified as bisexual reported higher demoralization ( $M = 29.59, SD = 20.50$ ) relative to those who identified as heterosexual ( $M = 20.42, SD = 16.73, p < .01$ , Cohen's  $d = 0.49$ ), corresponding to a medium effect. At time two, those who identified as bisexual reported greater demoralization ( $M = 27.21, SD = 20.41$ ) relative to those who identified as heterosexual ( $M = 19.67, SD = 17.36, p < .05$ , Cohen's  $d = 0.40$ ), corresponding to a moderate



to medium effect. Likewise, those who identified as a sexual identity not listed reported higher demoralization at time one ( $M = 44.50$ ,  $SD = 23.02$ ) relative to those who identified as heterosexual ( $p < .001$ , Cohen's  $d = 1.20$ ) or those who identified as gay or lesbian ( $M = 21.82$ ,  $SD = 20.86$ ,  $p < .05$ , Cohen's  $d = 1.03$ ), corresponding to large effects. These results should be viewed cautiously given the small sample size ( $n = 10$ ) of those who identified as a sexual orientation not listed. There were no other significant relationships between sexual orientations and study variables. Follow-up ANOVAs for the effects of intent to attend graduate school indicated that this variable predicted demoralization at time one ( $F_{(1, 345)} = 4.43$ ,  $p < .05$ ) and appraisals of falling short of standards ( $F_{(1, 345)} = 3.91$ ,  $p < .05$ ). Post hoc testing indicated that, at time one, those who reported intent to attend graduate school also reported greater demoralization ( $M = 24.15$ ,  $SD = 19.27$ ), relative to those who did not intend to attend graduate school ( $M = 16.75$ ,  $SD = 15.37$ ,  $p < .05$ , Cohen's  $d = 0.42$ ), corresponding to a moderate to medium effect. These individuals also reported greater appraisals of falling short of standards ( $M = 12.80$ ,  $SD = 7.58$ ), relative to those who did not intend to attend graduate school ( $M = 10.08$ ,  $SD = 5.48$ ,  $p < .05$ , Cohen's  $d = 0.41$ ), corresponding to a moderate to medium effect. There were no other significant relationships between demographic and study variables. Accordingly, analyses were conducted with and without including gender, identity as transgender, sexual orientation, and intent to attend graduate school as covariates. Results did not change and are reported without controlling for these demographics.

### ***Data Screening***

Descriptive statistics were run on the final sample and are presented in Table 2. Data was screened for univariate nonnormality; scores were considered normally distributed if skewness was between positive or negative (Cameron, 2004) and kurtosis was between positive or negative

three (DeCarlo, 1997; Joanes & Gill, 1998). Data was further screened for nonnormality using the function “identify\_outliers()” in R package *rstatix Version 0.7.0* (Kassambara, 2020), through the Shapiro–Wilk Test (Shapiro & Wilk, 1965), and by examining the probability-probability plot (P-P Plot), box plots, and histograms. Univariate outliers were considered extreme if their value was three times the interquartile range (Mishra et al., 2019). All variables were normally distributed, and no extreme univariate outliers were identified, with the exception of positive future thinking, in which two participants reported positive future thinking scores of 43 and 45. Analyses were run with and without these cases; since the results again did not differ, the primary analyses are reported with the full sample (i.e., with outliers included). Data was screened for multivariate outliers by producing Mahalanobis distance values (Mahalanobis, 1936). Six multivariate outliers were identified. Analyses were run with and without these cases and did not differ. Thus, analyses are reported with these cases included. Data was also screened for homoscedasticity and homogeneity of variance by examining the distribution of residual values plotted against predicted values. For the relationship between continuous study variables, homoscedasticity was further tested using the Breusch Pagan Test (Breusch & Pagan, 1979) in the function “ols\_test\_breusch\_pagan” in R package *olsrr* (Hebbali, 2020). Homoscedasticity was violated for positive future thinking ( $\chi^2_{(1)} = 12.39, p < .001$ ). Conducting a log-transformation (Carroll & Ruppert, 1988) of the outcome variable (i.e., demoralization) resulted in homoscedasticity for positive future thinking ( $\chi^2_{(1)} = 0.26, p = .61$ ). Primary analyses were run with and without the log transformed outcome variable and did not differ; to facilitate interpretability, results are reported with the untransformed outcome variable. For the relationship between continuous study variables and the categorical variable of study condition, homogeneity of variance was tested using Levene’s Test (Levene, 1960) in the function

“leveneTest()” in R package *car* (Fox & Weisberg, 2019). Homogeneity of variance was violated for appraisals of falling short of standards ( $F_{(2,344)} = 6.66, p < 0.01$ ). Given possible heterogeneity of variance, results of nonparametric tests were examined alongside parametric tests during hypothesis testing. The results of nonparametric tests did not differ from those of parametric tests, so parametric test results are reported. Data was screened for multicollinearity by examining the variance inflation factor (VIF). The study variables were not multicollinear (maximum VIF = 1.01; Hair et al., 2010). Finally, scatterplots of the study variables were produced to visually assess for linearity of relationships. Linear relationships amongst study variables was supported by visual inspection of the scatterplots and bivariate correlations (see Table 3).

### ***Manipulation Check***

Overall, participants rated the performance feedback moderately believable ( $M = 2.42, SD = 1.27$ ) and meaningful ( $M = 2.39, SD = 1.26$ ; range for both 0 to 4). Consistent with this, those assigned to the positive feedback condition rated the performance feedback as more positive ( $M = 3.77, SD = 2.22$ ) than those assigned to the neutral ( $M = 1.55, SD = 2.53$ ) or negative condition ( $M = -2.71, SD = 2.60$ ; range -5 to 5, all differences  $p < .0001$ ). Participants’ actual performance did not significantly affect feedback believability ( $p = .65$ ), feedback meaningfulness ( $p = .29$ ), or degree to which the feedback was perceived as positive versus negative ( $p = .10$ ). However, the difference between participants’ actual performance and the feedback condition to which they were assigned *did* affect believability and degree to which the feedback was perceived as positive versus negative. Specifically, there was a curvilinear (cubic) relationship between discrepancy and believability. For participants assigned to a more negative feedback condition than their actual performance (e.g., someone who actually scored in the 70<sup>th</sup>

percentile but was assigned to the 21<sup>st</sup> percentile condition), as discrepancy between actual performance and feedback condition approached zero, believability increased ( $B = 0.05, p = .05$ ). For those assigned to a feedback condition approximately comparable to their actual performance, there was no relationship between discrepancy and believability ( $B = -0.03, p = .42$ ). For those assigned to a more positive feedback condition than their actual performance (e.g., someone who actually scored in the 30<sup>th</sup> percentile but was assigned to the 91<sup>st</sup> percentile condition), as discrepancy between actual performance and feedback condition became greater (more positive), believability decreased ( $B = -0.07, p < .05$ ), with this negative relationship in turn reduced as positive discrepancy increased ( $B^3 = 0.0008, p < .05$ ). Additionally, assignment to a higher feedback condition than actual performance was associated with a *more positive* perception of this feedback ( $B = 0.38, p < .0001$ ), with this representing a linear relationship. Difference between actual performance and assigned feedback condition was unrelated to meaningfulness of feedback ( $B = 0.02, p = .20$ ). Analyses were run with and without controlling for actual performance and did not differ. Results were also run with and without controlling for difference between actual performance and assigned feedback condition and did not differ. Finally, results were run with and without controlling for ratings on the manipulation check and did not differ. Accordingly, results are reported without controlling for these variables.

## **Descriptive Statistics**

### ***Multidimensional Perfectionism Scale (MPS)***

Means and standard deviations for the Socially Prescribed Perfectionism (SPP) subscale of the MPS is presented in Table 2. No participants had missing data on this measure. As reviewed, there were no extreme outliers identified, and responses on the subscales were normally distributed. Scores obtained in the present sample were not significantly different from

those obtained in other samples reported elsewhere ( $Mc^1 = 60.54$ ;  $t_{(429)} = -1.58$ ,  $p = .11$ ; Hewitt et al., 1994).

### ***Future Thinking Task (FTT)***

Means and standard deviations for the FTT are presented in Table 2. As stated, the FTT had 4.90% missingness ( $n = 15$  participants missing responses for one time period,  $n = 1$  participant missing responses for two time periods,  $n = 1$  participant missing responses for all time periods). Mean imputation for the total score was used to produce complete data, as this results in unbiased estimates with less than 10% missing data (Eekhout et al., 2015). As reviewed, two extreme outliers were identified. Relative to when asked to think about the next week ( $M = 5.25$ ,  $SD = 2.35$ ), participants identified a greater number of positive future events when asked to think about the next year ( $M = 5.86$ ,  $SD = 2.15$ ,  $p < .001$ ) or the next five to ten years ( $M = 6.30$ ,  $SD = 2.38$ ,  $p < .001$ ). While this is counter to prior studies finding no effect of time on number of identified events (e.g., Goodby & MacLeod, 2016; MacLeod et al., 1993, 1997b; O'Connor et al., 2004), this may reflect current global events (e.g., coronavirus pandemic). That is, participants may have anticipated that they would be able to engage in a greater number of positive events (e.g., travel, concerts, weddings) further in the future. Interestingly, prior studies find higher and lower means at each time point relative to the present sample. Namely, Goodby & MacLeod (2016) find higher scores for the period of the next week ( $Mc = 7.07$ ;  $t_{(355)} = 3.77$ ,  $p < .0001$ ) and the next year ( $Mc = 7.37$ ;  $t_{(370)} = 3.37$ ,  $p < .001$ ), but comparable scores for the next five to ten years ( $Mc = 6.70$ ;  $t_{(371)} = 0.84$ ,  $p = .40$ ). In contrast, O'Connor et al. (2004) find lower scores for the period of the next week ( $Mc = 4.30$ ;  $t_{(430)} = -3.83$ ,  $p < .0001$ ), the next year ( $Mc = 4.36$ ;  $t_{(445)} = -6.51$ ,  $p < .0001$ ), and the next five to ten years

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<sup>1</sup> Means from compared studies

( $M_c = 4.88$ ;  $t_{(446)} = -5.64$ ,  $p < .0001$ ). The higher scores of Goodby & MacLeod (2016) may reflect that these were control participants, specifically screened for the absence of certain psychosocial, substance use, and learning disorders, which may have been present in the current sample and which may have affected positive future thinking. While the causes of the lower scores found by O'Connor et al. (2004) are not immediately clear — as this sample was also composed of undergraduate university students, similar to the present study — it is possible that this difference reflects the paradigm employed in their study. Specifically, participants completed the FTT for both positive *and* negative future events (resulting in six conditions), which may have been more demanding than completing the task for only positive future events. Additionally, it is unclear if any prior study has utilized the FTT in a virtual format and, accordingly, it is unclear if that may affect the number of events identified.

### ***Appraisals Scale (AS)***

The mean and standard deviation for the AS are presented in Table 2. As stated, the AS had 0.87% missingness ( $n = 3$  participants missing all items). Mean imputation for the total score was used to produce complete data. Skewness and kurtosis were within acceptable limits and no extreme outliers were identified. Given the reviewed modifications made to the scale in the present study (adapted from Smith and Lazarus's [1993] larger *Scale for Assessing Appraisal Components*) the degree to which these values are typical is not clear. Nonetheless, it was possible to compare the present results to the corresponding items from previous studies using unmodified and modified versions of the scale. The average scores in the present study ( $M = 4.18$ ,  $SD = 2.50$ ) were moderately lower than scores on the unmodified scale in Lowe and Bennett (2003;  $M_c = 5.68$ ;  $t_{(449)} = 5.66$ ,  $p < .0001$ ). They were also lower than scores on the modified version of the scale used in Bender (2020;  $M_c = 6.39$ ;  $t_{(662)} = -13.46$ ,  $p < .0001$ ). This

may reflect the nature of the present study. Namely, Lowe and Bennett (2003) and Bender (2020) were examining these appraisals in relation to work stress and negative life events, respectively. In contrast, the present study asked participants to appraise performance in response to positive, neutral, or negative feedback. Accordingly, the positive and neutral feedback conditions may have resulted in lower appraisals of falling short of standards, attenuating the present appraisal scores relative to those evident in the prior studies examining only negative objects of appraisal.

### ***Demoralization Scale (DS)***

The mean and standard deviation for the DS are presented in Table 2. As stated, the DS had 0.58% missingness ( $n = 2$  participants missing all items). Mean imputation for the total score was used to produce complete data. As reviewed, there were no extreme outliers, and responses on the scale were nearly normally distributed. As stated, demoralization was collected before and after the experimental manipulation, to control for baseline demoralization. At time one ( $M = 23.47$ ,  $SD = 19.05$ ), demoralization scores were comparable to those obtained in prior studies ( $M_c = 25.06$ ;  $t_{(665)} = 1.11$ ,  $p = .28$ ; Bender, 2020). At time two ( $M = 21.69$ ,  $SD = 18.57$ ) demoralization scores obtained in the present sample were significantly lower than those obtained in prior studies ( $M_c = 25.06$ ;  $t_{(665)} = 2.38$ ,  $p < .05$ ; Bender, 2020), but were comparable with other previous studies ( $M_c = 19.94$ ;  $t_{(445)} = 0.87$ ,  $p = .39$ ; Mullane et al., 2009).

**Table 2.** Descriptive Statistics

Variable	N	Mean	SD	Min	Max	Skewness	Kurtosis	Cronbach's Alpha
<u>Socially Prescribed Perfectionism</u>	347	57.78	14.70	21.00	99.00	0.10	-0.20	0.85
<u>Positive Future Thinking</u>	347	17.52	5.65	4.00	45.00	0.97	2.35	0.79
<u>Appraisals of Falling Short of Standards</u>	347	12.55	7.44	3.00	27.00	0.29	-1.03	0.88
<u>Demoralization Scale</u>	347	21.69	18.57	0.00	95.00	1.46	2.26	0.95

*Note:* Demoralization Scale at time two.



## Preliminary Relationships of Study Variables

Prior to testing study hypotheses, Pearson correlation coefficients were produced to examine the relationships of continuous study variables. Study correlations are presented in Table 3. As predicted, demoralization was related to appraisals of falling short of standards ( $r = .20, p < .01$ ) and socially prescribed perfectionism ( $r = .36, p < .01$ ). Similarly, A MANOVA supported the relationship of experimental condition with continuous study variables ( $F_{(2,344)} = 13.39, p < .0001$ ). Univariate ANOVAs indicated that experimental condition predicted appraisals of falling short of standards ( $F_{(2,344)} = 70.17, p < .0001$ ), but was unrelated to other study variables. These results are further discussed below (see Hypothesis Testing, Hypothesis 1).

**Table 3.** Intercorrelations of Study Variables

	1	2	3	4
1. SPP	1			
2. PFT	-.03	1		
3. App	.09	-.05	1	
4. DS	.36**	-.06	.20**	1

\*\* $p < .01$ , All correlations are Pearson's  $r$ . SPP = Socially Prescribed Perfectionism, PFT = Positive Future Thinking, App = Appraisals of Falling Short of Standards, DS = Demoralization Scale at time two.

## Hypothesis Testing

### *Hypothesis 1*

It was hypothesized that participants exposed to feedback that they have fallen short of comparative standards (compared to others) on a recently completed lab task would report perceiving greater appraisals of falling short of personal standards, relative to participants who received neutral or positive feedback. A one-way ANOVA was run to test this hypothesis, with experimental condition entered as the predictor variable and appraisals of falling short of standards entered as the criterion. As stated, the univariate ANOVA supported an effect of experimental condition on appraisals of falling short of standards ( $F_{(2,344)} = 70.17, p < .0001$ ),

accounting for 28.98% of the variance in these appraisals ( $R^2 = .2898$ ). Post hoc testing with Bonferroni corrections ( $\alpha = .017$ ) indicated that those assigned to the positive feedback condition (91<sup>st</sup> percentile) reported lower appraisals of falling short of standards ( $M = 7.49$ ,  $SD = 5.34$ ) relative to those assigned to the neutral feedback condition (51<sup>st</sup> percentile;  $M = 13.18$ ,  $SD = 6.46$ ,  $p < .0001$ , Cohen's  $d = 0.96$ ) or the negative feedback condition (21<sup>st</sup> percentile;  $M = 17.20$ ,  $SD = 7.00$ ,  $p < .0001$ , Cohen's  $d = 1.56$ ), with these differences both reflecting a large effect. Similarly, the difference in appraisals of falling short of standards between the neutral and negative feedback conditions was a significant medium effect ( $p < .0001$ , Cohen's  $d = 0.60$ ). Thus, Hypothesis 1 was supported. These results are presented in Figure 3.

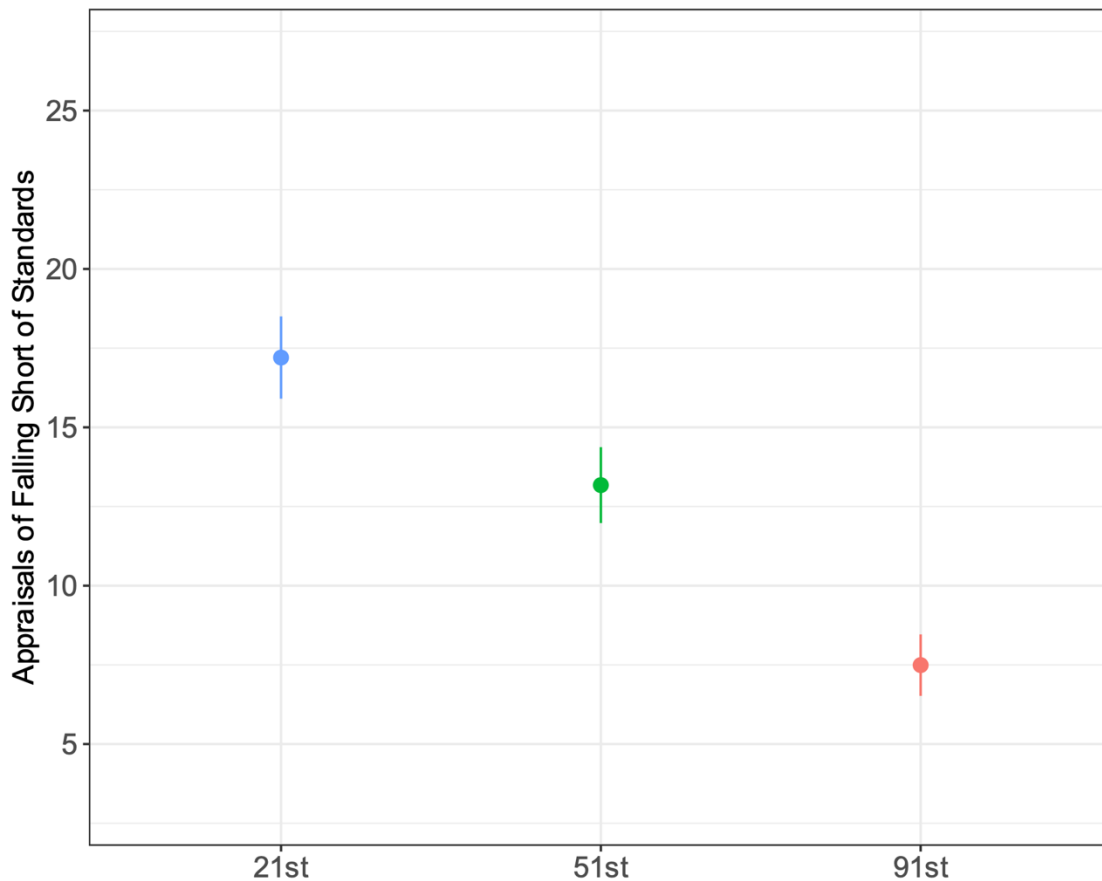


Figure 3. Appraisals of Falling Short of Standards by Condition.

**Hypothesis 1A.** It was hypothesized that one's trait levels of socially prescribed perfectionism would moderate the association between negative performance feedback and appraisals of falling short of personal standards, such that negative performance feedback would be increasingly related to appraisals of falling short of personal standards as individuals reported increasing socially prescribed perfectionism. A nested (hierarchical) ANOVA was run to test this hypothesis. Prior to testing moderation, socially prescribed perfectionism was mean-centered. In the first step, experimental condition and the proposed moderator of socially prescribed perfectionism were entered as predictors of appraisals of falling short of standards. In the second step, the interaction term, representing the interaction between experimental condition and perfectionism, was entered. The first step accounted for statistically significant variance in appraisals of falling short of standards ( $R^2 = .31$ ,  $F_{(3, 343)} = 50.74$ ,  $p < .0001$ )<sup>2</sup>. Experimental condition ( $F_{(2, 336)} = 74.22$ ,  $p < .0001$ ) predicted appraisals of falling short of standards; relative to the positive feedback condition, the neutral ( $B = 5.78$ ,  $p < .0001$ ) and negative ( $B = 9.91$ ,  $p < .0001$ ) feedback conditions predicted greater appraisals of falling short of standards. Socially prescribed perfectionism also predicted greater appraisals of falling short of standards ( $B = 0.07$ ,  $p < .01$ ). Using the formula provided by Peterson and Brown (2005) to convert the standardized beta ( $\beta = 0.13$ ) into a regression correlation ( $r = .18$ ) indicated that this corresponded to a small effect of socially prescribed perfectionism on appraisals of falling short of standards, regardless of the condition to which participants were assigned. The interaction term was not significant for the positive relative to neutral ( $B = -0.01$ ,  $p = .80$ ) or negative ( $B = -0.07$ ,  $p = .21$ ) feedback conditions. Additionally, the new model did not contribute significantly more variance than the

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<sup>2</sup> This model contributed significantly more variance than the model without socially prescribed perfectionism ( $\Delta R^2 = .02$ ,  $F_{(1, 338)} = 8.74$ ,  $p < .01$ ).

model without the interaction term ( $\Delta R^2 = .00$ ,  $F_{(2, 341)} = 0.85$ ,  $p = .43$ ). Accordingly, the results of the nested ANOVA did not support this hypothesis. These results are presented in Figure 4.

### ***Hypothesis 2***

It was hypothesized that participants exposed to feedback that they have fallen short of comparative standards would report greater scores of demoralization, relative to participants who received neutral or positive feedback. To test this hypothesis, a one-way ANOVA was run, with experimental condition entered as the predictor and residualized demoralization (i.e., demoralization at time two controlling for baseline demoralization) entered as the criterion. Results of the ANOVA supported a significant effect of experimental condition on demoralization ( $F_{(2, 344)} = 13.06$ ,  $p < .0001$ ,  $R^2 = .07$ ). Post hoc testing with Bonferroni corrections ( $\alpha = .017$ ) indicated that all conditions significantly differed from one another in effects on residualized demoralization. Participants assigned to the positive feedback condition experienced a reduction in demoralization ( $M = -2.87$ ,  $SD = 9.26$ ), while those assigned to the neutral feedback condition experienced a neutral effect on demoralization ( $M = 0.03$ ,  $SD = 8.72$ ,  $p < .05$ , Cohen's  $d = 0.32$ ), and those assigned to the negative feedback condition experienced an increase in demoralization ( $M = 2.96$ ,  $SD = 8.05$ ,  $p < .0001$ , Cohen's  $d = 0.67$ ). The neutral and negative feedback conditions also significantly differed from one another ( $p < .05$ , Cohen's  $d = 0.35$ ). Thus, results of the ANOVA supported this hypothesis. These results are presented in Figure 4.

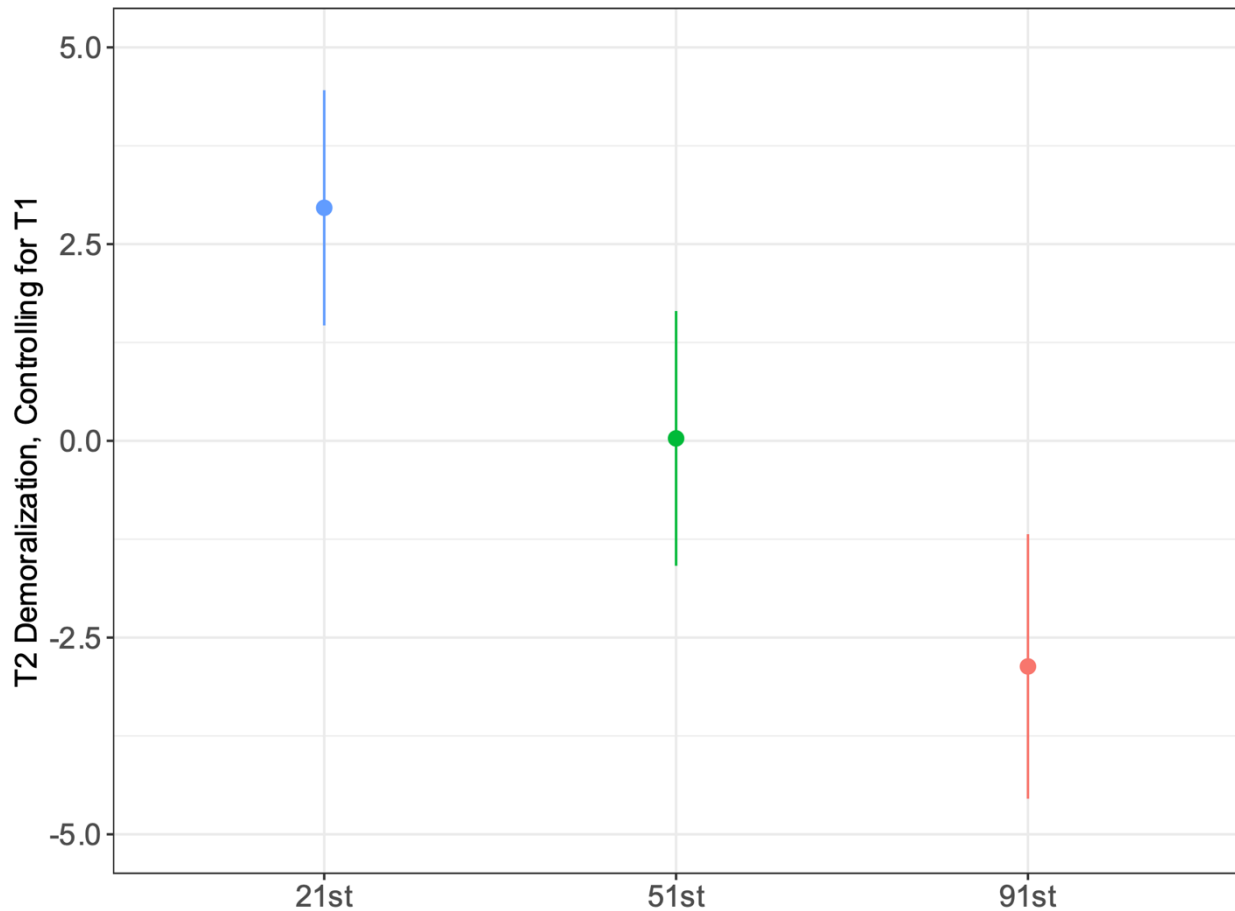


Figure 4. Changes in Demoralization by Condition.

**Hypothesis 2A.** It was hypothesized that appraisals of falling short of personal standards would mediate the relationship between performance feedback condition and residualized demoralization. To test this hypothesis, mediation analyses were conducted with 10,000 bootstrapped samples (Preacher and Hayes, 2004) using function “sem()” in the *lavaan* package version 0.6-8 (Rosseel, 2012). This generated the point estimate and confidence interval of the mediation effect. Mediation was considered tenable if zero did not fall within the bounds of the confidence interval. Experimental condition was entered as the independent variable, with the positive feedback condition dummy coded to be the reference group. Residualized demoralization was entered as the dependent variable, and appraisals of falling short of standards

was entered as the mediator. In the  $a$  path, both the neutral feedback condition ( $a = 5.68, p < .0001$ ) and the negative feedback condition ( $a = 9.71, p < .0001$ ) were associated with greater appraisals of falling short of standards, relative to the reference group of positive feedback condition (Hayes & Preacher, 2014). In the  $b$  path (the average effect of appraisals of falling short of standards on demoralization across feedback conditions; Hayes & Preacher, 2014), appraisals of falling short of standards significantly predicted greater demoralization ( $b = 0.35, p < .0001$ ). Results supported that both the neutral feedback condition ( $ab = 2.01, 95\% \text{ CI } [1.18, 3.10]$ ) and the negative feedback condition ( $ab = 3.44, 95\% \text{ CI } [2.07, 5.15]$ ) were associated with greater indirect effects on demoralization through pathways of appraisals of falling short of standards, relative to the reference group of positive feedback condition. The effect of receiving neutral, relative to positive, feedback appeared to be fully mediated by appraisals, as the direct effect was no longer significant ( $c' = 0.89, 95\% \text{ CI } [-1.47, 3.29]$ ), and was reduced relative to the total effect ( $c = 2.90, 95\% \text{ CI } [0.58, 5.12]$ ). In contrast, the effect of receiving negative, relative to positive, feedback appeared to be partially mediated by appraisals, as the direct effect remained significant ( $c' = 2.39, 95\% \text{ CI } [0.10, 4.77]$ ). However, this was still reduced from the total effect ( $c = 5.83, 95\% \text{ CI } [3.55, 7.99]$ ). The model accounted for 29% of the variance in appraisals ( $R^2 = .29$ ) and 13% of the variance in residualized demoralization ( $R^2 = .13$ ). These results are presented in Figures 5 and 6. Together, results of the mediation analyses support this hypothesis.

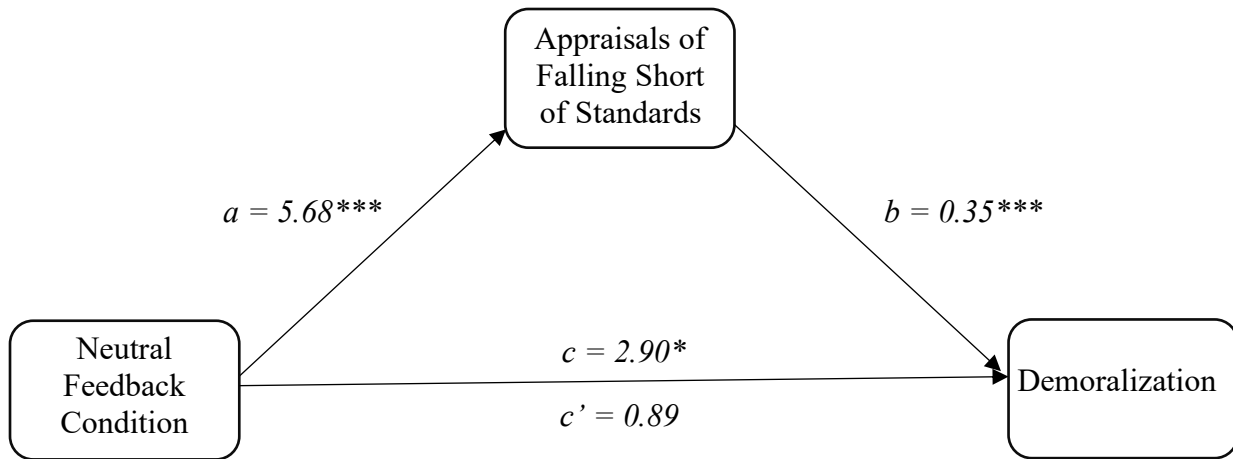


Figure 5. Mediation Model for Effect of Receiving Neutral relative to Positive Feedback.  
 \* =  $p < .05$ , \*\*\* =  $p < .0001$ .

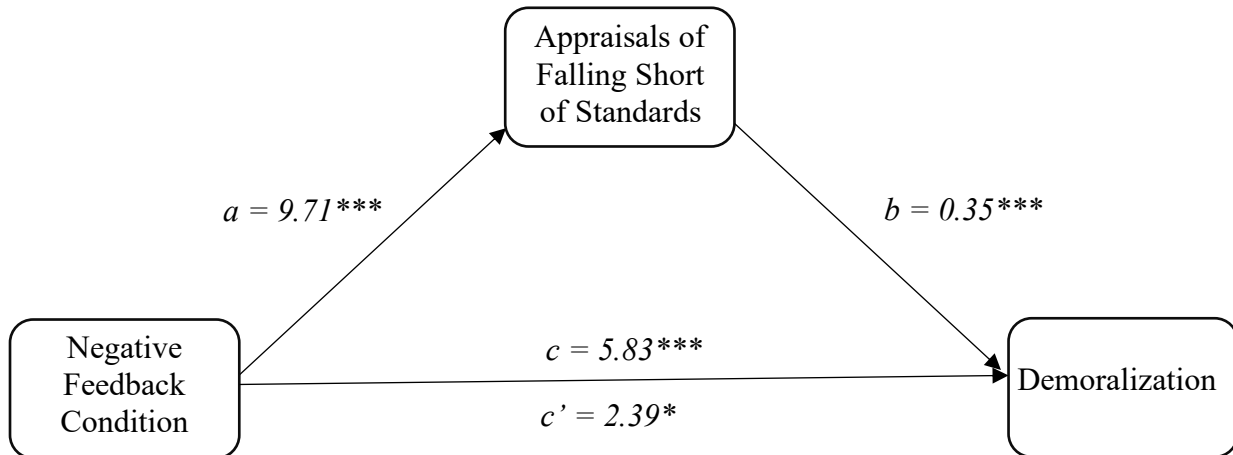


Figure 6. Mediation Model for Effect of Receiving Negative relative to Positive Feedback.  
 \* =  $p < .05$ , \*\*\* =  $p < .0001$ .

**Hypothesis 2B.** It was hypothesized that one’s trait levels of socially prescribed perfectionism would moderate the association between appraisals of falling short of personal standards and demoralization, such that these appraisals would increasingly be associated with demoralization scores as participants reported increasing socially prescribed perfectionism. To test this hypothesis, a hierarchical linear regression was run. Prior to testing moderation, the predictors, appraisals of falling short of standards and socially prescribed perfectionism, were

mean-centered. In the first step, appraisals of falling short of standards and the proposed moderator of socially prescribed perfectionism were entered as predictors of residualized demoralization. In the second step, the interaction term, representing the interaction between appraisals and perfectionism, was entered. The first step accounted for statistically significant variance in residualized demoralization ( $R^2 = .13$ ,  $F_{(2, 344)} = 24.22$ ,  $p < .0001$ ). While appraisals of falling short of standards ( $B = 0.42$ ,  $p < .001$ ) predicted significantly greater residualized demoralization, corresponding to a moderate effect ( $r = .40$ ), socially prescribed perfectionism did not predict greater residualized demoralization ( $B = 0.02$ ,  $p = .60$ ). The interaction term was not significant ( $B = 0.00$ ,  $p = .83$ ), and the new model did not contribute significantly more variance than the model without the interaction term ( $\Delta R^2 = .00$ ,  $F_{(1, 343)} = 0.05$ ,  $p = .83$ ). Thus, the results did not support this hypothesis. Socially prescribed perfectionism did not predict acute changes in demoralization across the study period, and did not moderate the significant relationship between appraisals of falling short of standards and changes in demoralization.

**Hypothesis 2C.** It was hypothesized that one's positive future thinking would moderate the association between appraisals of falling short of personal standards and demoralization, such that these appraisals would decreasingly be associated with demoralization scores as participants reported increasing positive future thinking. To test this hypothesis, a hierarchical linear regression was run. Prior to testing moderation, the predictors, appraisals of falling short of standards and positive future thinking<sup>3</sup>, were mean-centered. In the first step, appraisals of falling short of standards and the proposed moderator of positive future thinking were entered as predictors of residualized demoralization. In the second step, the interaction term, representing the interaction between appraisals and positive future thinking, was entered. The first step

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<sup>3</sup> Controlling for verbal fluency



accounted for statistically significant variance in residualized demoralization ( $R^2 = .12$ ,  $F_{(2, 344)} = 24.51$ ,  $p < .0001$ ). While appraisals of falling short of standards ( $B = 0.43$ ,  $p < .001$ ) again predicted significantly greater residualized demoralization, positive future thinking did not predict greater residualized demoralization ( $B = -0.08$ ,  $p = .38$ ). The interaction term was not significant ( $B = -0.00$ ,  $p = .74$ ), and the new model did not contribute significantly more variance than the model without the interaction term ( $\Delta R^2 = .01$ ,  $F_{(1, 343)} = 0.11$ ,  $p = .74$ ). Thus, the results did not support this hypothesis.

### **Exploratory Analyses**

#### ***Interaction of Self-Oriented Perfectionism and Feedback Condition on Appraisals of Falling Short of Standards***

In Hypothesis 1A, it was hypothesized that one's trait levels of socially prescribed perfectionism would moderate the association between negative performance feedback and appraisals of falling short of personal standards, such that negative performance feedback would be increasingly related to appraisals of falling short of personal standards as individuals reported increasing socially prescribed perfectionism. This was not supported. However, it is possible that participants perceived the comparative performance feedback (i.e., feedback relative to others) as an indicator of their ability to meet *their own* standards of how they think they should perform relative to others, rather than an indicator of how they believe *others* think they should perform. That is, individuals may have their own personal standards on how they think they should perform compared to others. Accordingly, this performance feedback may have instead been particularly aversive for those who hold high standards for *themselves* (i.e., self-oriented perfectionism), rather than those who perceive that *others* have high standards *for* them (i.e., socially prescribed perfectionism). To this end, it is possible that self-oriented perfectionism may

uniquely have a moderating effect, where socially prescribed perfectionism did not. A nested (hierarchical) ANOVA was run to test this possibility. Prior to testing moderation, self-oriented perfectionism was mean-centered. In the first step, experimental condition and the proposed moderator of self-oriented perfectionism were entered as predictors of appraisals of falling short of standards. In the second step, the interaction term, representing the interaction between experimental condition and self-oriented perfectionism, was entered. The first step accounted for statistically significant variance in appraisals of falling short of standards ( $R^2 = .30$ ,  $F_{(3, 343)} = 48.43$ ,  $p < .0001$ ). Experimental condition ( $F_{(2, 336)} = 70.92$ ,  $p < .0001$ ) predicted appraisals of falling short of standards; relative to the positive feedback condition, the neutral ( $B = 5.79$ ,  $p < .0001$ ) and negative ( $B = 9.71$ ,  $p < .0001$ ) feedback conditions predicted greater appraisals of falling short of standards. Self-oriented perfectionism did not predict greater appraisals of falling short of standards ( $B = 0.04$ ,  $p = .05$ ). The interaction term was not significant for the positive relative to neutral ( $B = 0.05$ ,  $p = .28$ ) condition, but was significant for the positive relative to negative feedback condition ( $B = 0.12$ ,  $p < .05$ ). Additionally, the new model contributed significantly more variance than the model without the interaction term, even after employing Bonferroni correction ( $p < .0125$ ) for prior moderation analyses ( $\Delta R^2 = .01$ ,  $F_{(2, 343)} = 3.18$ ,  $p < .05$ ). Accordingly, the results of the nested ANOVA indicated that receiving negative, relative to positive, feedback was increasingly related to appraisals of falling short of standards as individuals reported increasing self-oriented perfectionism. These results are presented in Figure 7.

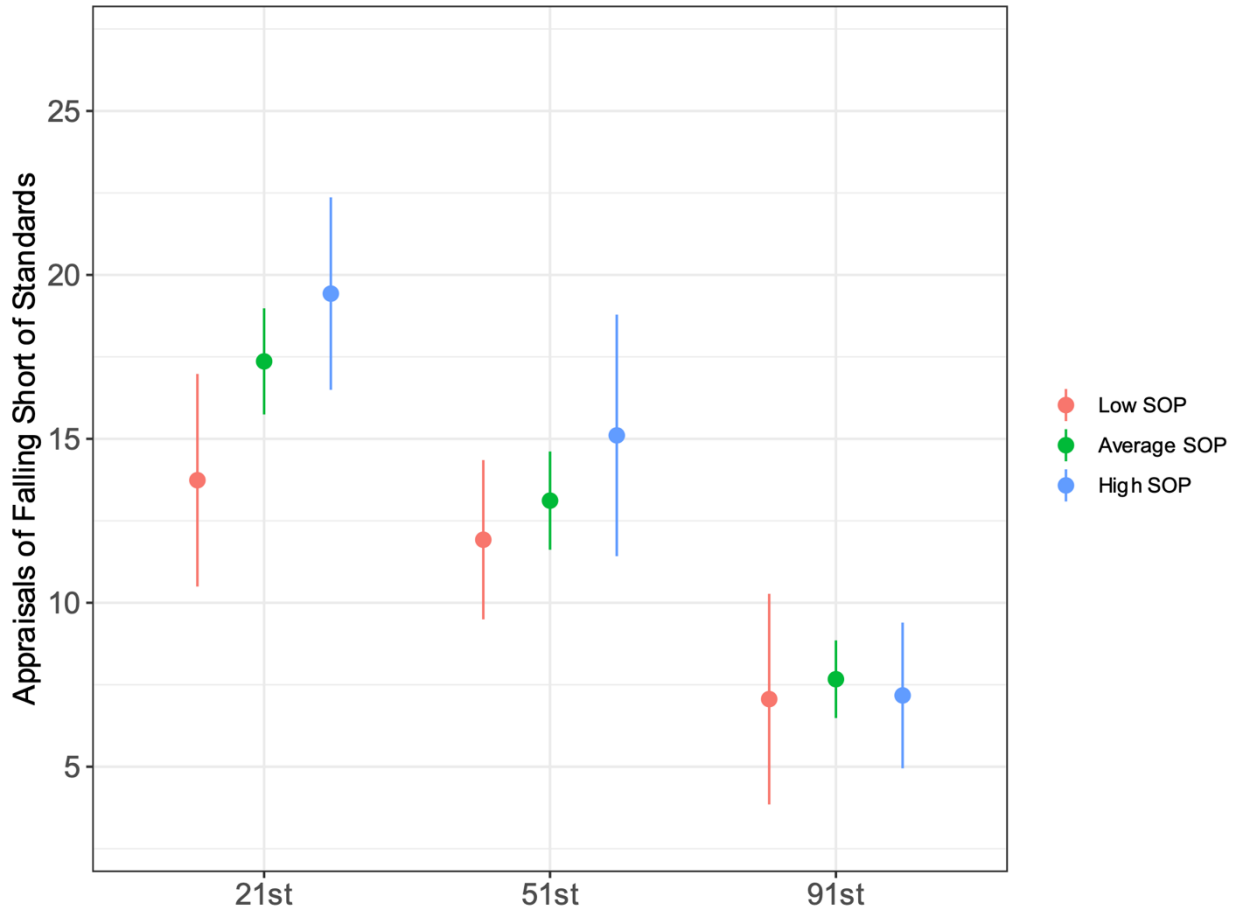


Figure 7. Appraisals of Falling Short of Standards by Condition and SOP.

The results of the simple slopes analysis indicated that there was a significant, positive relationship between self-oriented perfectionism and appraisals of falling short of standards for those assigned to the negative performance feedback condition ( $B = 0.11, p < .01; 95\% \text{ CI } [0.04, 0.18]$ ). In contrast, there was no significant relationship between self-oriented perfectionism and appraisals of falling short of standards for those assigned to the neutral ( $B = 0.03, p = .29; 95\% \text{ CI } [-0.03, 0.10]$ ) or positive ( $B = -0.02, p = .64; 95\% \text{ CI } [-0.08, 0.05]$ ) feedback conditions. Further, since the beta coefficient for those assigned to the negative feedback condition was outside the 95% confidence intervals for the beta coefficients of those assigned to either the neutral or positive feedback conditions, this slope significantly differed from the others. These

results indicated that there was only a significant relationship between self-oriented perfectionism and appraisals of falling short of standards for those participants assigned to the negative feedback condition. In this condition, participants experienced increasing appraisals of falling short of standards as they reported increasing self-oriented perfectionism. In the positive and neutral feedback conditions, self-oriented perfectionism was not significantly related to appraisals of falling short of standards, such that participants appraised their respective feedback conditions similarly regardless of levels of self-oriented perfectionism.

### ***Interaction of Self-Oriented Perfectionism and Appraisals of Falling Short of Standards on Demoralization***

Given that the present appraisals reflected appraisals of falling short of *personal* standards, it is possible that self-oriented perfectionism may uniquely have a moderating effect, rather than socially prescribed perfectionism, given that the former refers to standards *one sets for oneself*. To test this possibility, a hierarchical linear regression was run. Prior to testing moderation, the predictors, appraisals of falling short of standards and self-oriented perfectionism, were mean-centered. In the first step, appraisals of falling short of standards and the proposed moderator of self-oriented perfectionism were entered as predictors of residualized demoralization. In the second step, the interaction term, representing the interaction between appraisals and perfectionism, was entered. The first step accounted for statistically significant variance in residualized demoralization ( $R^2 = .12$ ,  $F_{(2, 344)} = 24.17$ ,  $p < .0001$ ). While appraisals of falling short of standards ( $B = 0.42$ ,  $p < .0001$ ) predicted significantly greater residualized demoralization, corresponding to a moderate effect ( $r = .40$ ), self-oriented perfectionism did not predict greater residualized demoralization ( $B = 0.01$ ,  $p = .66$ ). The interaction term was not significant ( $B = 0.00$ ,  $p = .90$ ), and the new model did not contribute significantly more variance

than the model without the interaction term ( $\Delta R^2 = .00$ ,  $F_{(1, 343)} = 0.02$ ,  $p = .90$ ). Thus, the results suggested that self-oriented perfectionism did not predict residualized demoralization or affect the relationship between appraisals of falling short of standards and demoralization.

### ***Complete Exploratory Model***

Based on the results of these analyses, an exploratory integrated model was proposed whereby the mediational effect of appraisals of falling short of standards would continue to mediate the relationship between feedback condition and residualized demoralization, with the relationship between feedback condition and appraisals moderated by self-oriented perfectionism. To test this exploratory integrated model, path analysis was run in R Version 4 (R Core Team, 2020) using the *lavaan* package version 0.6-8 (Rosseel, 2012). First, the model to be estimated was specified. This model was then estimated, and fit was evaluated. The results of the analysis supported excellent fit to the data, as indicated by a nonsignificant chi-square ( $\chi^2_{(3)} = 0.997$ ,  $p = .80$ ), a CFI greater than 0.95 (CFI = 1.00), and an RMSEA of less than 0.05 (RMSEA = 0.00; Hu & Bentler, 1999; Kenny, 2015). The model explained 13.2% of the variance in residualized demoralization ( $R^2 = 0.13$ ), a medium effect (Cohen, 1988). In the *a* path, both the neutral feedback condition ( $a1 = 5.74$ ,  $p < .0001$ ) and the negative feedback condition ( $a1 = 9.59$ ,  $p < .0001$ ) were again associated with greater appraisals of falling short of standards, relative to the reference group of positive feedback condition (Hayes & Preacher, 2014). Self-oriented perfectionism did not predict appraisals of falling short of standards ( $a2 = -0.02$ ,  $p = .66$ ). Again, the interaction term was not significant for the positive relative to neutral ( $a3 = 0.05$ ,  $p = .33$ ) feedback condition, but was significant for the positive relative to negative ( $a3 = 0.12$ ,  $p < .05$ ) feedback condition. This suggested that those assigned to the negative feedback condition experienced increasingly greater appraisals of falling short of standards relative to those assigned

to the positive feedback condition as they experienced increasing self-oriented perfectionism. In the  $b$  path (the average effect of appraisals of falling short of standards on demoralization across feedback conditions and at mean levels of self-oriented perfectionism), appraisals of falling short of standards again significantly predicted greater demoralization ( $b = 0.35, p < .0001$ ).

Next, the moderated indirect effect was examined. The indirect effect of performance feedback on demoralization through appraisals of falling short of standards was significant for the neutral feedback condition ( $[a1 + a3]/[b] = 2.05, 95\% \text{ CI } [1.18, 3.18]$ ). The moderated indirect effect was also significant for the negative feedback condition ( $[a1 + a3]/[b] = 3.44, 95\% \text{ CI } [2.08, 5.11]$ ). This suggested that both conditions were associated with greater indirect effects on demoralization through their effects on appraisals of falling short of standards, relative to the reference group of positive feedback condition. Additionally, the effect of feedback condition on appraisals of falling short of standards along the pathway to demoralization was moderated by self-oriented perfectionism for the negative feedback condition. In fact, the effect of receiving neutral, relative to positive, feedback appeared to be fully mediated by appraisals, as the direct effect was no longer significant ( $c' = 0.89, 95\% \text{ CI } [-1.41, 3.28]$ ), and was reduced relative to the total effect ( $c = 2.93, 95\% \text{ CI } [0.78, 5.40]$ ). In contrast, the effect of receiving negative, relative to positive, feedback appeared to be partially mediated by moderated appraisals, as the direct effect remained significant ( $c' = 2.39, 95\% \text{ CI } [0.16, 4.83]$ ). However, this was still reduced from the total effect ( $c = 5.83, 95\% \text{ CI } [3.80, 8.23]$ ). The model accounted for 31% of the variance in appraisals ( $R^2 = .31$ ) and 13% of the variance in residualized demoralization ( $R^2 = .13$ ).

Finally, modification indices were examined for potential modifications. The results indicated that there were no modification indices which would significantly improve model fit

(i.e., reduce model  $\chi^2$  by at least 3.84 [Kaplan, 1990; Steiger, 1990]; maximum modification index = 0.76 [regressing assignment to the neutral feedback condition on residualized demoralization]). Accordingly, no modifications were made. The final models are presented in Figures 8 and 9.

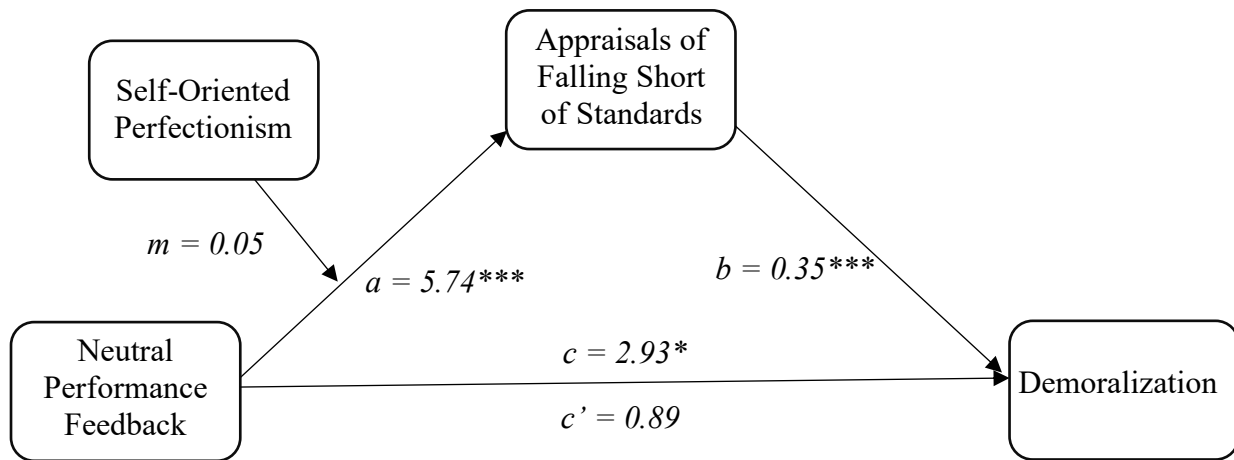


Figure 8. Statistical model of the mediated effect of neutral performance feedback on demoralization through appraisals of falling short of standards, with non-significant moderation by self-oriented perfectionism.  $*$  =  $p < .05$ ,  $**$  =  $p < .01$ ,  $***$  =  $p < .001$ .

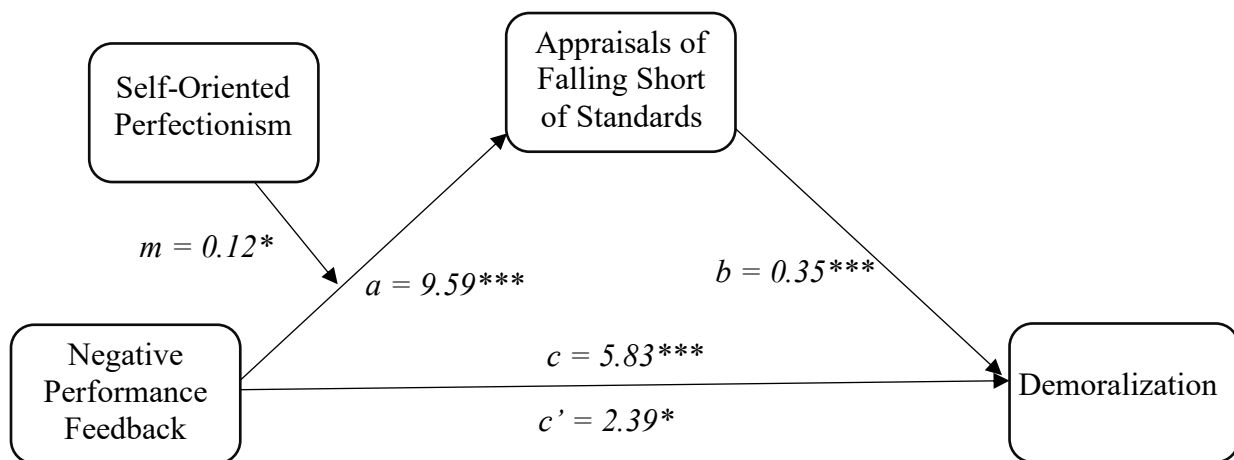


Figure 9. Statistical model of the mediated effect of negative performance feedback on demoralization through appraisals of falling short of standards, with moderation by self-oriented perfectionism.  $*$  =  $p < .05$ ,  $**$  =  $p < .01$ ,  $***$  =  $p < .001$ .

## **Chapter 4: Discussion**

The present study aimed to identify a mechanism by which negative performance feedback events come to be maladaptive, as well as contextual factors which may exacerbate or mitigate risk. Consistent with theories of self-discrepancy and self-regulation (Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987), it was proposed that negative performance feedback events would lead to increases in demoralization through a pathway of appraisals of falling short of standards. It was further proposed that negative performance feedback would increasingly relate to appraisals of falling short of standards as one reported increasing socially prescribed perfectionism. Finally, it was proposed that the relationship between appraisals of falling short of standards and demoralization would be affected by both socially prescribed perfectionism and positive future thinking, such that the former would potentiate the relationship and the latter would attenuate it. As hypothesized, the relationship between negative performance feedback and demoralization operated through a mechanism of appraisals of falling short of standards. Contrary to hypotheses, however, the relationships between these constructs were not affected by socially prescribed perfectionism or positive future thinking. Along with exploratory analyses, these results begin to clarify factors particularly relevant to the experience of this common negative life event.

### **Negative Performance Feedback and Increased Demoralization through Appraisals of Falling Short of Standards**

It was hypothesized that participants assigned to the negative performance feedback condition would exhibit greater demoralization. This hypothesis was supported. The present



finding is consistent with considerable observational research linking negative performance feedback with outcomes such as negative affect, distress, dissatisfaction, goal disengagement, devaluation of the relevant domain, lower self-efficacy, lower motivation, greater avoidance of subsequent evaluation, lower self-worth, greater concern over mistakes, and increased verbal and physical aggression (Alam & Singh, 2019; Barry et al., 2006; Belschak & Den Hartog, 2009; Biernat & Danaher, 2012; J. D. Brown, 2010; Dimotakis et al., 2017; Fishbach et al., 2010; Fonteyne et al., 2018; Geddes & Baron, 1997; M. Hall et al., 2012; Lundgren & Rudawsky, 1998; Lundgren et al., 1998; Madjar et al., 2015; Viciano et al., 2007; Weidinger et al., 2016). Fewer studies have experimentally manipulated valence of performance feedback. In these studies, negative performance feedback has been found to predict greater negative affect, anxiety, depression, hostility, dissatisfaction with performance, cognitive rumination about mistakes, and negative comparative evaluations (i.e., perceptions of performance relative to others), as well as lower positive affect, self-confidence, self-efficacy, satisfaction, and motivation (Anshel & Mansouri, 2005; Besser et al., 2004, 2008; Blackler, 2011; Choi et al., 2018; Cooks, 2017; Cooks & Ciesla, 2019; Frost et al., 1995; Lo & Abbott, 2019; Nease et al., 1999; Stoeber et al. 2007, 2008, 2013, 2014; Stoeber & Yang, 2010; Van Dijk & Kluger, 2011). While informative, these studies left several key questions unanswered, which the present study attempted to address.

The present study extended this growing body of research in several important ways. This study was the first to experimentally connect negative performance feedback events with demoralization, specifically. Not only is demoralization empirically discriminable from these previously studied outcomes (e.g., depression; Jacobsen et al., 2006; Mehnert et al., 2011), but it also appears to be more consistent with relevant theory (Baumeister, 1990; Frank, 1961, 1986;

Kissane, 2004; Kissane et al., 2001, 2004; O'Connor, 2011; Williams 1997, 2001), suggesting that it may be an outcome of particular importance for negative performance feedback events. The consequence of this finding may be most impactfully underscored by research linking demoralization, more than many of the other previously studied constructs, to suicidal ideation and risk for suicide (Anestis et al., 2018; Clarke et al., 2005; Fang et al., 2014; Kissane, 2004; Lau et al., 2010; Vehling et al., 2017). To this end, negative performance feedback may not only contribute to broad cognitive and affective sequelae, but may specifically contribute to a state linked with increased suicide risk. That is, negative performance feedback may contribute to the subjective incompetence, helplessness, despair, and defeat that comprise demoralization (Frank, 1974; Kissane et al., 2004). Individuals who receive feedback that they have performed poorly may begin to question their own competence, as well as their ability to improve their competence in the future (e.g., a “fixed” mindset; Dweck 2013), particularly if subject to repeated negative feedback, or negative feedback on domains of high personal importance. They may come to view their poor performance as something representing a fairly stable, internal, uncontrollable, and global construct (Abramson et al., 1978), resulting in a sense of helplessness and despair. Contextualized within the framework of Williams’s Cry of Pain Model of Suicide (1997, 2001), the individual may come to feel defeated and entrapped by this negative feedback, or by their own cognitive and emotional responses to it, and may view suicide as a means of escape from this entrapment and pain (see also Baumeister, 1990; O'Connor, 2011). This is one possible conceptualization of the relationship between negative performance feedback and demoralization found in the present study.

Alternatively, negative performance feedback may relate to demoralization because it communicates something about one’s view of oneself. That is, those who receive negative

performance feedback may begin to question the degree to which they “fit” in any particular relevant domain (e.g., graduate school, the field of psychology, etc.), which may be highly valued to the individual or central to their identity. Negative performance feedback may communicate risk of exclusion from this valued pursuit or social group, or may lead the individual to feel like an imposter in this pursuit (e.g., imposter phenomenon; Clance & Imes, 1978; Lee et al., 2021), contributing to downstream demoralization. Similarly, negative performance feedback may contribute to demoralization to the degree that it influences one’s sense of purpose or meaning, which has been found to be highly adaptive (e.g., Goodman et al., 2018; Mohseni et al., 2019; Ostafin & Proulx, 2020). In the context of the present study, an individual may wish to study psychology, eventually pursuing a career in this field; this pursuit may confer a great deal of meaning or purpose to the individual’s life (e.g., to help others). Negative performance feedback may communicate that this pathway to meaning or purpose is blocked to the individual, leading to greater demoralization. Methodologically, negative performance feedback may have also contributed to demoralization in the present study due to participant demand (e.g., Nichols & Maner, 2008). That is, participants randomly assigned to negative performance feedback may have perceived that they were expected to exhibit greater demoralization, and thus may have responded accordingly. This seems moderately unlikely, since participants were theoretically unaware of the manipulation or other feedback conditions at this time, and controlling for perceived believability of feedback did not affect results. Nonetheless, other studies may wish to employ an experimental design which further minimizes the possibility of participant demand or other methodological confounds. These are several of many possible factors which may explain and affect the relationship between negative performance feedback and demoralization.

The present study was also among the first to include adequate levels of comparison for the effects of performance feedback. Few prior studies have included a true *neutral* feedback condition, instead comparing positive to negative feedback. Including only positive feedback as the comparison group may artificially inflate the effects of negative performance feedback, as positive feedback itself may affect demoralization or related outcomes. Indeed, in the current study, positive performance feedback demonstrated a comparable relationship to demoralization as negative performance feedback, though in the opposite direction; in contrast, there appeared to be no effect of neutral feedback on demoralization, suggesting that positive feedback is *not* a neutral condition. This is consistent with a substantial body of research suggesting that positive feedback has an uplifting, rather than neutral, effect (Hardy & McLeod, 2020; Jones et al., 2019; Rumfola, 2017; Skinner, 1953; Wei & Yazdanifard, 2014; Wexley & Nemeroff, 1975). To this end, positive performance feedback may in fact serve a protective effect against demoralization. Demoralization is theorized to result from a perceived failure to effectively cope with actual or appraised stressors (Frank, 1974; Kissane et al., 2004); receiving positive performance feedback may communicate to individuals that they are capable of coping and responding effectively to other life stressors. Future research may wish to examine how positive performance feedback not only *reduces* demoralization, but may also *increase* constructs such as coping self-efficacy, feelings of empowerment, and a sense of hope. While the field of psychology has predominantly focused on the study of what goes wrong for individuals (e.g., identifying factors that may contribute to greater psychopathology or other maladaptive outcomes; Seligman & Csikszentmihalyi, 2014), the finding that positive feedback may confer a protective effect offers an opportunity to pursue an alternative research approach. Namely, this may encourage research that focuses on what goes *right* — that considers the positive events that may *improve* individual

functioning. However, while one interpretation is that positive performance feedback contributes to reduced demoralization because it is perceived as uplifting, another possibility is that individuals just naturally experience reductions in demoralization over time (e.g., via regression to the mean, affect regulation, or other mechanisms); thus it is possible that the positive feedback condition allowed for this natural reduction, while the neutral and negative feedback conditions masked or even reversed it. If this is the case, it would suggest that neutral performance feedback itself may be experienced as aversive, and may contribute to greater demoralization. Additional research is needed to clarify this possibility.

Finally, this study is among the first to identify a potential *mechanism* by which this negative life event comes to be maladaptive. This builds on a growing body of research differentiating the specific situational appraisals and cognitive pathways (Ahles et al. 2015; Cox et al., 2009; Garnefski et al., 2003; Grandin et al., 2007; Harkness & Stewart, 2009; Nicolai et al., 2013; C. L. Park et al., 2012; Safford et al., 2007; Steger & Park, 2012) for individual negative life events versus those for aggregate (Besser & Priel, 2011; Blatt & Zuroff, 1992; Dalgard et al., 2006; Holmes & Rahe, 1967; Kendler et al., 2001; Kraaij et al., 2002; R. T. Liu & Miller, 2014; Myers et al., 1972; Poulin & Silver, 2019; Sandanger et al., 2004; Smyth et al., 2008). First, this study found support for a relationship between negative performance feedback and appraisals of falling short of standards (i.e., the *a* path), consistent with theories of self-discrepancy (e.g., Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987), in which individuals monitor their environment for information on progress towards goals and needs, looking for signs of discrepancy or short-coming. This is also consistent with related empirical research, which has found a relationship between negative life events broadly and appraisals of falling short of standards (Bender, 2020), between perceived failure and appraisals

of putting forth insufficient effort to meet standards (Neumesiter, 2004a), and between negative performance feedback and appraisals of failing to meeting roles or expectations (Berke et al., 2017; Besser et al., 2004). Considered alongside these results, the present research highlights a way in which individuals attempt to make sense of or ascribe meaning to a life event such as negative performance feedback. As with the direct pathway, these results may also reflect participant demand, in that participants assigned to the negative performance feedback condition may have perceived they *should* appraise this performance as falling short of standards. However, again, the risk of participant demand is somewhat mitigated by participants' being blind to other conditions and study hypotheses. Further, these appraisals themselves were meaningfully related to subsequent affect.

Next, this study found support for a relationship between appraisals of falling short of standards and demoralization (i.e., the *b* path). Very limited empirical research has examined these constructs, finding support for a positive relationship (Bender, 2020). Despite this dearth of empirical investigation, this is again consistent with theories of self-discrepancy (Bandura, 1991; Carver and Scheier, 1981; Festinger, 1957; Higgins, 1987), in which detected discrepancy is theorized to lead to negative affect. At moderate levels, this negative affect may potentially motivate efforts to reduce discrepancy (e.g., changing one's view of self or changing the situation). However, when this negative affect becomes too intense or aversive, the individual may instead become overwhelmed, and may be unable or unwilling to self-regulate to reduce discrepancy. In the context of the present study, a longitudinal design might clarify if participants who experienced mild or moderate demoralization in response to their performance feedback would be more likely to engage in cognitive (e.g., meaning-making, reappraisal) or behavioral (e.g., increased studying of Psychology GRE materials) attempts to reduce discrepancy, relative

to those who experienced more severe demoralization. It is worth noting that the relationship between appraisals of falling short of standards and demoralization may be an artifact of method effects (Spector, 2006), as both were assessed with self-report Likert-style scales, and accordingly, some shared variance may simply be a result of this similarity in measurement. However, given that socially prescribed perfectionism was operationalized similarly, it would not be expected that the correlation of appraisals of falling short of standards and demoralization would uniquely be affected by this methodological overlap. Furthermore, research suggests that the inflationary effect of common method variance is almost entirely negated by the attenuating effect of measurement error (Lance et al., 2010). Nonetheless, future research may wish to account for this possibility by employing alternate methodologies (e.g., interviewing, behavioral observation, laboratory tasks, etc.) or analytic strategies (e.g., multitrait multimethod matrix; Campbell & Fiske, 1959).

Consistent with the understudied nature of the component pathways, no prior studies have examined a comprehensive model wherein appraisals of falling short of standards serve as a mechanism of the relationship between negative performance feedback and demoralization. This pathway would be predicted by Baumeister's Escape Theory of Suicide (1990), wherein aversive affective states are theorized to result from negative life events involving failure or setback, which are appraised as the individual's having fallen short of standards. Similarly, O'Connor's IMV Theory of Suicide (2011) proposes that negative life events appraised as failing to meet standards may signal defeat, humiliation, or other similarly aversive states. Although understudied empirically, this relationship is consistent with the work of Lakey and Edmundson (1993), who found that negative life events categorized by domain (e.g., academic, family, romantic relationships, etc.) led to depressive symptoms through a pathway of appraisals of

failure to meet expectations specific to that domain role (e.g., role as a student, daughter, partner, etc.). The results found in the present study suggest that the effects of receiving negative, or indeed even neutral, performance feedback — relative to positive — may reflect the way the individual *thinks* about this feedback, rather than the feedback itself. That is, once the effects of appraisals were accounted for, the direct relationship between performance feedback and demoralization was substantially reduced (i.e., for the negative feedback condition) or nullified (i.e., for the neutral feedback condition). To this end, targeting appraisals may be critical for reducing distress, particularly given that negative performance feedback is likely to remain a common life experience for most individuals and may not always be preventable (e.g., Belschak & Den Hartog, 2009; G. L. Bradley et al., 2016; Finkelstein et al., 2017). Therefore, rather than avoiding negative performance feedback entirely, individuals may be best served by learning to adjust how they think about this feedback. Instead of interpreting negative performance feedback as an instance of falling short of standards, one might view it as an opportunity to grow and learn new skills (e.g., Dweck, 2013) or to practice self-compassion and flexibility in their expectations of themselves (Malkoç et al., 2019; Neff, 2011; Neff et al., 2007; Palm & Follette, 2011).

In summary, then, the present study establishes a relationship between performance feedback and demoralization; not only does negative performance feedback appear to predict greater demoralization, but positive performance feedback may in fact be protective against this outcome. Importantly, appraisals of falling short of standards, rather than the feedback itself, may be critical in explaining these relationships.



## **The Effect of Self-Oriented Perfectionism on the Relationship Between Feedback Condition and Appraisals**

In addition to establishing the pathway of negative performance feedback's effects, the present study was among the first to consider contextual factors that may affect this pathway. In particular, no known studies have examined the influence of either dimension of perfectionism on the relationship between performance feedback and appraisals of falling short of standards. In an unexpected finding, the present results indicated that the degree to which negative performance feedback contributed to appraisals of falling short of standards depended on levels of self-oriented perfectionism, such that negative performance feedback was increasingly related to these appraisals as individuals reported increasing self-oriented perfectionism. In contrast, socially prescribed perfectionism was not found to affect this relationship. This is somewhat surprising, given that achievement striving in self-oriented perfectionism is theorized to be motivated by the individual's internal curiosity, interest, or goals (e.g., hope of success; DeCharms & Davé, 1965), rather than a fear of falling short of standards (e.g., fear of failure; DeCharms & Davé, 1965), and this is supported by empirical research (e.g., Conroy et al., 2007; Klibert et al., 2005; Stoeber et al., 2009). Accordingly, it is unclear why self-oriented perfectionism would uniquely predict greater appraisals of falling short of standards. Further, self-oriented perfectionism is theorized to reflect a more intrapersonal construct, in which one sets high standards for oneself (Hewitt & Flett, 1989, 1990), often relative to one's own prior performance or abilities (Mills & Blankstein, 2000; Neumeister & Finch, 2006). To this end, it is not clear why the effects of comparative negative performance feedback (i.e., performance feedback relative to *others'* performance) would be uniquely affected by self-oriented perfectionism. Relatedly, while prior research has found perfectionism to increase the

relationship between negative performance feedback and general negative affect, anxiety, hostility, dysphoria, disappointment, shame, guilt, rumination, self-esteem, physiological reactions (i.e., heart rate and systolic blood pressure), and self-handicapping on subsequent trials, among other outcomes (Anshel & Mansouri, 2005; Besser et al., 2004, 2008; Blackler, 2011; Cooks, 2017; Cooks & Ciesla, 2019; Frost et al., 1995; Lo & Abbott, 2019; Stoeber et al., 2007, 2008, 2013, 2014; Stoeber & Yang, 2010), this research has generally found that socially prescribed perfectionism, rather than self-oriented perfectionism, affects the experience of negative performance feedback (e.g., Besser et al., 2008; Flett et al., 1994; Johnson et al., 2017; Stoeber et al., 2008, 2013; Stoeber & Yang, 2010). Thus, the reviewed theory and extant research suggest that self-oriented perfectionism is unlikely to uniquely affect responses to comparative negative performance feedback. Nonetheless, theoretical and methodological considerations may explain the present results.

The unexpected influence of self-oriented perfectionism found in the present study may be consistent with the reviewed theory, simply adding greater complexity to this understanding. Namely, although achievement striving in self-oriented perfectionism does not appear to be motivated by fear of failure or shortcoming (Conroy et al., 2007; Klibert et al., 2005; Stoeber et al., 2009), this does not necessarily mean that individuals elevated in this dimension of perfectionism are immune to *perceiving* instances of falling short of standards. Instead, it may mean that those with elevated self-oriented perfectionism *experience* such appraisals as less aversive, or respond to them in a more balanced or resilient manner. Consistent with this, self-oriented perfectionism was unrelated to demoralization in the present study and did not moderate the effect of appraisals of falling short of standards on demoralization. To this end, future research may wish to discriminate between *perception* of falling short of standards (i.e., is

shortcoming detected) and *response* to falling short of standards (e.g., what meaning is ascribed to shortcoming, how does the individual respond, etc.). Furthermore, the present results may reflect the nature of the appraisal measure utilized. That is, the present study measured appraisals of falling short of *personal* standards. To this end, individuals may set standards for *themselves* of how they would like to perform relative to others, and self-oriented perfectionism may particularly influence the effect of negative performance feedback on appraisals of falling short of these *self-imposed* standards. Different findings may have emerged for appraisals of falling short of *others'* (e.g., parents, peers, mentors) standards for how the individual performs relative to others. This opens the possibility that the effects of either dimension of perfectionism may be specific to their domain, with self-oriented perfectionism affecting appraisals related to falling short of one's own standards, and socially prescribed perfectionism affecting appraisals related to falling short of others' standards. This requires additional study.

Accordingly, while there was not support for an interactive effect by socially prescribed perfectionism on appraisals of falling short of standards, it is possible that other types of appraisals *would* depend on this dimension of perfectionism. Namely, given the interpersonal nature of socially prescribed perfectionism (e.g., Hewitt & Flett, 1991a), it is possible that it would instead affect appraisals of falling short of *others'* standards. More specifically, since this dimension of perfectionism is closely linked with strong negative affect such as shame and guilt (Frost et al., 1993; Hewitt & Flett, 1991b; Klibert et al., 2005), it may bring about evaluative appraisals, such as perceptions of having let others down or of having disappointed others. Similarly, socially prescribed perfectionism may affect what the individual believes this negative performance feedback means for social support or belonging. Prior research establishes that this dimension of perfectionism is associated with anticipatory fear of interpersonal consequences for

failure (Conroy et al., 2007); in the face of actual negative feedback, increasing socially prescribed perfectionism may predict increasing fear of losing or upsetting important others due to this poor performance. Therefore, future research may wish to consider other types of appraisals that may be affected by socially prescribed perfectionism in the context of negative performance feedback.

While self-oriented perfectionism may increase vulnerability for appraisals of falling short of standards in the context of negative performance feedback, other methodological or conceptual considerations may partially explain the present results. Again, participant demand (e.g., Nichols & Maner, 2008) may influence results, as those who report greater self-oriented perfectionism may feel that they should also report greater appraisals of falling short of standards when faced with negative performance feedback. Nonetheless, if this was the case, it would not explain why those reporting elevated socially prescribed perfectionism did not perceive a similar demand, nor why this demand was only perceived by those in the negative feedback condition, considering that participants were blind to other conditions. Alternatively, there may be conceptual explanations for these findings that differ from those reviewed. Namely, these results have primarily been reviewed through a somewhat negative lens, with the assumption that self-oriented perfectionism increases vulnerability for these appraisals due to a more negative, self-critical evaluation of one's performance. However, it is instead possible that self-oriented perfectionism is associated with these appraisals due to a more positive view of oneself or one's abilities and potential. That is, individuals with elevated self-oriented perfectionism may view themselves as more competent or high-achieving, and this self-view may remain intact in the face of discrepant performance, which itself may be perceived as a rare exception or as due to external circumstances. This would resemble the self-enhancing biases (Bonanno et al., 2002,

2005; Mancini & Bonanno, 2009; Taylor & Brown, 1988, 1994; Weinstein, 1980) which are found to predict greater resilience, and would be consistent with theory and research presenting self-oriented perfectionism as more broadly adaptive (e.g., Chen et al., 2015; Hewitt & Flett, 1989, 1990; Hill et al., 1997; Mushquash & Sherry, 2012; Roxborough et al., 2012) and related to greater self-esteem (e.g., Besser et al., 2008; Trumpeter et al., 2006). Accordingly, future research may wish to further explore the nature of the relationship between self-oriented perfectionism and appraisals of falling short of standards, particularly in the context of negative performance feedback.

### **Socially Prescribed Perfectionism as a Robust Risk Factor for Appraisals of Falling Short of Standards**

While socially prescribed perfectionism did not affect the relationship between feedback condition and appraisals of falling short of standards, socially prescribed perfectionism did exhibit an independent main effect on these appraisals, revealing an unexpected result. Namely, even in the absence of negative performance feedback, socially prescribed perfectionism was associated with greater appraisals of falling short of standards; receiving “positive” feedback did not reduce the relationship between socially prescribed perfectionism and the belief that one has fallen short of standards. This appears to suggest that those high in socially prescribed perfectionism are more likely to view even the 91<sup>st</sup> percentile as falling short of standards — that is, that being in the 91<sup>st</sup> percentile is below desired or expected performance. This may speak to the elevated nature of standards in those who are high in this dimension of perfectionism (e.g., Hewitt & Flett, 1989, 1991b, 2002) and may suggest that positive performance feedback alone is not enough to be protective against the cognitive sequelae of this domain of perfectionism. This may reflect a biopsychosocial vulnerability wherein individual and environmental factors

transact to produce elevated standards and greater appraisals of falling short of standards. Intrapersonally, individuals may begin by setting high standards for themselves, which may lead them to elicit reinforcing responses for achievement in their environments (e.g., evocative *rGE*; Knafo & Jaffee, 2013) or to seek out new environments (e.g., academic organizations, Ivy League universities) in which achievement is expected and reinforced (e.g., active *rGE*; Knafo & Jaffee, 2013). Interpersonally, the individual's environment may enhance these predispositions, for instance by explicitly or implicitly communicating messages to the effect that even the 91<sup>st</sup> percentile, for example, is not high enough. There is research to support that the standards perceived by individuals with elevated socially prescribed perfectionism are in fact veridical; that is, that those in their environment do set high, or even unrealistic, standards for the individual (e.g., Smith et al., 2017a, 2017b, 2017c, 2019). As a result of these internal and environmental vulnerabilities, individuals with elevated socially prescribed perfectionism may appraise nearly *any* feedback as falling short of standards, and accordingly may come to dread nearly any instance in which receipt of feedback is likely or certain. In future research, it would be compelling to study if socially prescribed perfectionism predicts greater negative affect in *anticipation* of possibly receiving any feedback, more so than self-oriented perfectionism. Indeed, given the reviewed intrapersonal motivation characteristic of self-oriented perfectionism (i.e., motivated by internal goals, interests, hopes for success rather than fear of failure) such individuals may experience positive affect (e.g., enthusiasm, engagement) in anticipation of receiving feedback. Supporting the distinction between the two dimensions of perfectionism, in the present study there was no similar main effect of self-oriented perfectionism on appraisals of falling short of standards. Exploration of the interaction effect indicated that self-oriented perfectionism was only related to appraisals of falling short of standards in the context of

negative performance feedback; absent this negative feedback, self-oriented perfectionism did not appear to act as an independent vulnerability factor for these appraisals.

These results may reveal the nature of vulnerability conferred by either dimension of perfectionism. Specifically, socially prescribed perfectionism may be most accurately conceptualized as a vulnerability factor which enhances risk even in the absence of a relevant stressor. In contrast, self-oriented perfectionism may be best conceptualized within a diathesis-stress framework (e.g., Chang & Rand, 2000; Flett et al., 1995; O'Connor et al., 2010) — that is, as a vulnerability factor which is fairly benign — or indeed, even adaptive — unless maladaptive features are activated in the context of a relevant stressor. This would be consistent with a substantial body of research which finds socially prescribed perfectionism to be consistently more maladaptive (Enns & Cox, 1999; Flett et al., 1991, 2004; Hewitt & Flett, 1991a, 1991b; Limburg et al., 2017; Martin et al., 1996; Shafran & Mansell, 2001; Wyatt & Gilbert, 1998), whereas self-oriented perfectionism appears to be maladaptive to a lesser degree or only in certain contexts (e.g., Blankstein et al., 2007; Chen et al., 2015; Dean & Range, 1999; Dean et al., 1996; Flett et al., 1995; Frost et al., 1993; Hewitt & Flett, 1991b; Klibert et al., 2005; Mushquash & Sherry, 2012; Roxborough et al., 2012; Smith et al., 2018b; Wyatt & Gilbert, 1998) and indeed may at times be adaptive (Childs & Stoeber, 2010; Frost et al., 1993; Hill et al., 1997; Mills & Blankstein, 2000). This is likewise consistent with previous research establishing socially prescribed perfectionism as a robust risk factor (for demoralization) relative to self-oriented perfectionism (Bender, 2020). Collectively, these findings corroborate the maladaptive nature of socially prescribed perfectionism, and suggest that self-oriented perfectionism may likewise come to be maladaptive, though only in certain contexts.

As with the findings for self-oriented perfectionism, alternative methodological and conceptual explanations should be considered. One possibility is that order effects (Krosnick & Alwin, 1987) influenced these results, in that completing the measure of perfectionism — and thus thinking about one’s own perfectionistic traits — primed appraisals of falling short of standards. Given that *all* participants completed the measure of perfectionism prior to receiving performance feedback and completing the measure of appraisals, this would not explain the results entirely (i.e., even those reporting low levels of socially prescribed perfectionism would be similarly primed for appraisals of falling short of standards). Nonetheless, completing this measure shortly before engaging in the performance task and receiving performance feedback may have amplified the true relationship between socially prescribed perfectionism and appraisals of falling short of standards — for instance, by making more salient thoughts about others’ standards for oneself or perceptions of consequences for not meeting these standards. It is possible that a lesser effect would have been found between trait socially prescribed perfectionism and appraisals of falling short of standards if the measure of perfectionism had been completed more distally to the receipt of negative performance feedback (e.g., several days before), if perfectionism had been assessed more covertly (e.g., by observer/other report or behavioral observation), or if perfectionism had been measured after ratings of appraisals. Future research may wish to explore these possibilities. It is also worth noting that the main effect of socially prescribed perfectionism on appraisals of falling short of standards did not similarly translate to a main effect on residualized demoralization. That is, socially prescribed perfectionism did not predict acute *changes* in demoralization in the present study. Nor did socially prescribed perfectionism augment the relationship between appraisals of falling short of standards and demoralization. To this end, as with self-oriented perfectionism, it is possible that



socially prescribed perfectionism increases *perception* of shortcoming (here even in the absence of negative performance feedback, in contrast to self-oriented perfectionism), but does not necessarily predict the degree to which this perceived shortcoming is experienced as aversive. Alternatively, it is possible that the present feedback was not sufficiently interpersonal in nature for resulting appraisals to be affected by socially prescribed perfectionism. That is, socially prescribed perfectionism may predict greater increases in demoralization in response to appraisals about more public, interpersonal feedback, particularly if delivered by a valued source. For instance, if participants had received a (pseudo) laboratory-wide email from their primary investigators expressing disappointment in the individual's recent performance as a research assistant, socially prescribed perfectionism may have predicted greater acute increases in demoralization in response to appraisals about this feedback. In contrast, the present study evaluated how socially prescribed perfectionism affected demoralization in response to appraisals about feedback delivered privately, conceivably by a computerized scoring system. Thus, socially prescribed perfectionism may only predict a more negative response to appraisals of falling short of standards when these appraisals are related to a more interpersonal or public feedback event. These and other possibilities may be explored in future studies.

### **Lack of Moderation by Positive Future Thinking**

An important contribution of the present study was consideration of a factor that may be *protective* in the face of negative performance feedback, as few prior studies in this area have considered protective factors (e.g., Blackler, 2011). It was hypothesized that one's level of positive future thinking would reduce the effect of appraisals of falling short of standards on demoralization, such that these appraisals would be decreasingly related to demoralization as one reported increasingly positive future thinking. This was not supported. This is counter to

substantial research, which establishes positive future thinking to predict greater well-being (MacLeod & Conway, 2007) and reduced maladaptive outcomes such as hopelessness, depression, and suicidal ideation and behavior (Bjärehed et al., 2010; Conaghan & Davidson, 2002; Hunter & O'Connor, 2003; Kosnes et al., 2013; Lavender & Watkins, 2004; MacLeod et al., 1993, 1997b, 1998, 2005; MacLeod & Conway, 2007; MacLeod & Cropley, 1995; MacLeod & Salaminiou, 2001; Morina et al., 2011; R. C. O'Connor et al., 2000, 2004, 2007, 2008, 2015; Sarkohi, 2011; Stöber, 2000). While this was the first study to consider positive future thinking as a protective factor in the context of appraisals of falling short of standards, prior research finds a protective effect for the related construct of optimism in the context of negative performance feedback events (Blackler, 2011). There may be something unique about optimism which is protective in the face of negative performance feedback or accompanying appraisals, relative to positive future thinking. In particular, optimism appears to reflect a broader, more stable, trait-like construct (Atienza et al., 2004; Carver et al., 2010; Carver & Scheier, 2014; R. E. Lucas et al., 1996; Matthews et al., 2004; Renaud et al., 2018; Scheier et al., 1994; Scheier & Carver, 1985, 1992), whereas positive future thinking has been found to change over time (Hanssen et al., 2013; MacLeod et al., 1998; Meevissen et al., 2011; Peters et al., 2010; Vilhauer et al., 2013) and to decrease in response to even brief experimental stressors (e.g., Boselie et al., 2014; O'Connor & Williams, 2014; Williams et al., 2008). In the present study, it is possible that the feedback received by participants served as a stressor event which attenuated participants' positive future thinking, or the protective nature of this thinking, since the feedback occurred after measurement of positive future thinking but before measurement of appraisals and demoralization. This may particularly be the case, as a cursory review of participants' responses indicated that many of their reported positive future events were directly relevant to the feedback

received (that is, related to graduate school or a future career in psychology). The performance feedback may have diminished anticipation of specific positive future events that participants had been looking forward to, thus reducing the protective nature of these events. In contrast, given its stable nature, optimism may be more resilient to environmental influence, and thus may have remained protective against demoralization regardless of the feedback received. This is an empirical question which remains to be tested. Alternatively, even if individuals believe they have something to look forward to, they may nonetheless continue to experience the same degree of helplessness, subjective incompetence, and defeat in this present moment. In other words, similar to the independence of positive and negative affect (e.g., Dejonckheere et al., 2018, 2019; Diener & Emmons, 1984), it is possible that positive future thought and demoralization do not necessarily vary inversely. Future research will need to be conducted to test this possibility. In addition to these considerations, the present results may also reflect methodological considerations.

The lack of hypothesized moderation by positive future thinking may reflect qualitative heterogeneity in participants responses. While the present study operationalized positive future thinking as a simple count of number of positive future events reported, consistent with prior research (e.g., Lavender & Watkins, 2004; MacLeod et al., 1993, 1997; MacLeod & Conway, 2007; MacLeod & Salaminiou, 2001; R. C. O'Connor et al., 2000, 2004), this may not have been a fully comprehensive assessment of the construct. That is, other factors beyond *number* of events may be important to consider in measuring strength of positive future thinking. In the present results, participants appeared to vary substantially in their *depth of processing* positive future events, with some providing well-thought-out expectancies (e.g., “in 5-10 years I could have my PhD in clinical psychology,” “Realizing that my boyfriend can become my future

husband and marrying him”) and others writing simpler responses (e.g., “married,” “kids,” “stable job”). It is unclear if this linguistic complexity may have affected, or perhaps reflected, participants’ strength of positive future thinking. It may be that stronger positive future thinking is reflected by items that are more in-depth or detailed. It is worth noting that results were run with and without controlling for verbal fluency (measured separately) and did not differ, and are reported with controlling for this variable. Nonetheless, the present results may have been different if a weighting system was utilized, wherein participant responses were weighted by depth of processing or complexity of responses. Responses also differed with regards to *specificity*, with some responses concrete and specific (e.g., “going to grad school in [state],” “start working toward a nonprofit for LGBTQ youth”) and others far vaguer (e.g., “being happy,” “be rich”). Again, stronger positive future thinking may be reflected by more specific answers, and the present results may have been different if responses had been weighted for specificity. Participants seemed to further vary in the *degree of importance* or *emotionality* of responses, with some reporting responses likely to be highly important or emotional (e.g., “getting married,” “have children,” “progressing in the journey of learning to love myself”), and others reporting responses less likely to be so (e.g., “I may smile from a joke,” “go to the beach often”). This presents as an additional feature by which it may be informative to weight participants’ positive future thoughts. Responses further appeared to vary with regards to anticipated *likelihood* of occurrence; that is, some participants seemed quite certain their reported events would occur, whereas others used more tentative language (e.g., “I could...,” “I might...”). Events which are perceived as more likely to occur may represent stronger positive future thinking; assessing for and weighting by perceived likelihood may influence the results found in the present study. Relatedly, recent research has found positive future thinking to

actually increase risk for suicidal ideation, specifically due to the tendency to imagine more positive future events that are less *realistic* and *achievable* (Pollak et al., 2021). The degree to which positive future thinking is realistic or achievable may be yet another important feature to consider via weighting in operationalizing the construct of positive future thinking. Interestingly, prior studies have weighted positive future thinking by participant ratings of likelihood (Bjärehed et al., 2010; Hunter & O'Connor, 2003; MacLeod et al., 1998, 2004, 2005; Sarkohi, 2011; Sarkohi & Andersson, 2011), vividness of imagery (Daniel et al., 2013a, 2013b), and type of positive future event (i.e., social/interpersonal, intrapersonal, leisure/pleasure, health of others, financial and home, other; R. C. O'Connor et al., 2015; Godley et al., 2001). However, few studies have actually tested if weighting affects results; of those that have, it seems that likelihood ratings generally do not meaningfully change results, but they may amplify effects (Bjärehed et al., 2010; MacLeod et al., 2005; Sarkohi, 2011). Additionally, to date, no known studies have weighted positive future thinking scores by specificity, degree of importance/emotionality, or achievability/feasibility. Future studies may wish to account for these and other sources of heterogeneity, and to assess the degree to which they influence results. Collectively, these results suggest that several features could affect the strength of positive future thinking, beyond just number of events. Further, positive future thinking may be adaptive *under certain conditions* (e.g., when individuals see a clear path towards bringing about these events or have reasonable hope that these events *will* occur), but may be neutral or in fact even maladaptive under other conditions.

In addition to the above considerations, it is important to note that the present study took place during the Covid-19 pandemic, which may have affected responses. Indeed, many responses reflected a desire for the pandemic to be over (e.g., “covid will be over hopefully,”

“covid could get a vaccine and disappear”). The pandemic may have made participants’ positive future thinking more tentative (or considered in light of the above features, the pandemic may have made participants’ positive future thinking perceived as less *likely* to actually occur). Further, and counter to previous research (e.g., Goodby & MacLeod, 2016; MacLeod et al., 1993, 1997b), the present study found an effect for time, wherein participants reported a greater degree of positive thinking for events further in the future. Given the ongoing pandemic at the time of data collection, participants may have anticipated fewer positive events to occur within the next week, relative to the next year, and the next five to ten years. It is unclear if this may have influenced the protective nature of positive future thinking; it is possible that viewing positive events as more distal (e.g., unlikely to occur within the near future) attenuated their protective effects, particularly among those with limited abilities to delay gratification (Datu et al., 2020; Poon et al., 2021). In sum, there are a number of different features which may be important to consider in operationalizing the strength of positive future thinking beyond just number of events, including depth of processing, specificity, degree of importance/emotionality, likelihood, and achievability/feasibility, among others. While the present study did not find a protective effect for positive future thinking in the relationship between appraisals of falling short of standards and demoralization, results might have been quite different controlling for some of these features, particularly likelihood. Thus, future research is needed to better clarify features that best operationalize strength of positive future thinking, and the degree to which (or conditions in which) positive future thinking is actually protective.

## **Limitations**

While the present study contributed to the literature on contextual effects of negative performance feedback events, cognitive appraisals, perfectionism, positive future thinking and demoralization, these results should be viewed in light of several limitations.

### ***Use of Self-Report Survey Data***

Measurement of perfectionism, cognitive appraisals, and demoralization relied on self-report survey data, while measurement of positive future thinking was likewise self-report. This form of data collection may be particularly vulnerable to inaccurate responding (e.g., Wright, 2005). Nevertheless, careless responding appears unlikely to have affected the present results, given that attention checks were embedded in the study surveys, and those who failed more than one attention check were removed. As reviewed, those removed for failing attention checks were more likely to identify as Black/African American, Arabic/Middle Eastern, or as a race/ethnicity not listed. They were less likely to identify as White/Caucasian or Asian/Asian American. They were also more likely to live at home with family or to live in a residence not listed, and were less likely to live in on-campus housing. There may be something about self-report methodology which contributes to less attentive responding in these samples. For example, these participants may have fewer positive experiences with research, may be wary of the research process, or may have greater demands on their time (e.g., George et al., 2014). Given that completing self-report measures virtually may require lower engagement or investment than other methodologies (e.g., in-person interviews or laboratory tasks), such participants may be more vulnerable to inattentive responding when completing these measures. Nonetheless, race/ethnicity and residential status were unrelated to study variables, and thus were unlikely to affect the present results; nevertheless, future research may wish to address these limitations by oversampling for these

demographics. Self-report data may also be vulnerable to social desirability effects (Arnold & Feldman, 1981). However, considerable research suggests greater disclosure of potentially sensitive topics on self-report measures relative to other methodologies (Corrigan & Watson, 2002; Kaplan et al., 1994) and self-report measures may be more accurate than other methodologies (e.g., observer reports) for internal processes such as demoralization, perfectionism, and cognitive appraisals and expectancies (e.g., Manassis et al., 2009). Future research may benefit from employing a multitrait-multimethod approach (Campbell & Fiske, 1959) to measure these constructs. For instance, some work has been done to develop semi-structured interviews of perfectionism (e.g., Riley et al., 2007; Riley & Shafran, 2005), although it is unclear the degree to which these conceptualizations of the construct match those of Hewitt and Flett (1989, 1991a). Thus, while the data from self-report measures may be limited by careless responding, social desirability, or lack of observer reports, this methodology nonetheless may have facilitated greater disclosure, more accurate representation of these internalizing processes, and reduced participant demand.

### ***Lack of Temporal Precedence between Appraisals of Falling Short of Standards and Demoralization***

While it was theorized that appraisals of falling short of standards contributed to demoralization, it is also conceivable that the reverse is true, given that both the hypothesized mediator (appraisals) and the hypothesized outcome (demoralization) were measured at the same time (i.e., lack of temporal precedence; Kazdin, 2007). It is possible that participants felt demoralized by the study and searched for the reason they felt that way, subsequently explaining it as the belief that they fell short of standards. Nonetheless, the proposed directionality is consistent with considerable theory, which posits a cognitive mechanism for downstream



consequences of negative life events (Beck, 1964; Fabes & Eisenberg, 1997; Folkman & Lazarus, 1984; Lazarus, 1991, 1999b, 1999c; Park, 2012; Rutter, 1981, 1985b, 1999). Additionally, to control for this limitation, these relationships were run in reverse direction, with time two demoralization, as well as changes in demoralization, tested as predictors of appraisals of falling short of standards. The regression coefficients were consistently greater in the hypothesized direction than in the reverse. Further, baseline demoralization was not significantly related to appraisals of falling short of standards ( $B = 0.01, p = .57$ ), suggesting that demoralization is unlikely to affect subsequent appraisals. Future research may benefit from employing longitudinal, daily diary, or ecological momentary assessment (EMA; Shiffman et al., 2008) designs to clarify this directionality.

### ***Undergraduate Psychology Sample***

An undergraduate psychology sample may limit generalizability of the present findings, particularly considering the study's selected experimental manipulation (i.e., pseudo Psychology GRE). Psychology undergraduates are likely far more invested in feedback on this type of performance task; indeed, that is why it was selected for the present study. However, this presents an opportunity for the research to be adapted to other samples. Future studies can manipulate performance feedback on tasks of high importance to their included samples, to determine if the present effects translate. Studies sampling from non-psychology undergraduates could manipulate performance feedback on tasks presented as reflecting broader academic performance (e.g., general GRE, midterm/final, writing samples, evaluation/letter of recommendation from professor, etc.). Similarly, studies sampling from non-college samples could manipulate performance feedback on occupational (e.g., pseudo evaluation of work performance), social (e.g., pseudo feedback from peer/confederate in a social laboratory task),

financial (e.g., pseudo evaluations of financial literacy, financial security, preparedness for retirement, etc.) or other domains. While college samples are often limited in their over-inclusion of participants who are young, white, heterosexual, and highly educated (Pew Research Center, 2016, 2017; U.S. Census Bureau, 2018; U.S. Department of Education, 2016), the present sample was nonetheless fairly diverse, with 55% of the sample identifying as non-white, 33% identifying as non-heterosexual, 31% identifying as first-generation college students, and 28% identifying as Hispanic/Latino. While the mean age was 21 years old ( $SD = 4.15$ ), the range did extend to 61 years. Regardless, future research may wish to adapt the present framework to samples that are more culturally diverse (e.g., greater diversity with regards to age, race/ethnicity, sexual orientation, education, etc.). Even beyond demographic differences, the culture of college/university samples may affect results. That is, attendance at college or university may be a time in which standards and expectations are particularly salient, and attainment of future success and financial independence feels particularly precarious. Additionally, receipt of feedback is extremely common while in an academic setting; those in other settings where feedback is less common or expected may respond quite differently to positive or negative performance feedback. To this end, future studies are encouraged to consider sampling from populations where these factors (e.g., frequency of feedback, degree of expectations) may differ.

### **Summary and Future Directions**

Despite these limitations, this study presented with several strengths and directions for future research.

### ***Negative Performance Feedback and Increased Demoralization through Appraisals of Falling Short of Standards***

This was the first known study to establish a mediational relationship between negative performance feedback and demoralization through a pathway of appraisals of falling short of standards, documenting an effect for both neutral and negative performance feedback relative to positive. Future research may wish to examine additional cognitive factors which may explain (mediate) or affect (moderate) the pathway identified in the present study. For instance, it may be that repeated or cumulative negative performance feedback confers additive effects on appraisals or subsequent demoralization. If this is the case, it may be compelling to determine if this negative performance feedback needs to correspond to the same domain (e.g., repeated negative performance feedback at work from one's employer) or may accumulate across domains (e.g., negative performance feedback at work, from one's spouse, in competitions/hobbies, etc.). Additionally, while the present study established a relationship between negative performance feedback and appraisals of falling short of standards, it is unclear how individuals think about this discrepancy; that is, do individuals view this falling short of standards as an internal, global and stable quality (e.g., reflective of a larger pattern or an immutable quality within themselves), or do they view it as something from which they can recover, improve, learn or grow? Likewise, while the present study examined cognitive *responses* to negative performance feedback, it may also be worth identifying state and trait-like factors that make one vulnerable to *perceiving* negative performance feedback, such as prior negative feedback, low mood, low self-esteem, or other factors.

### ***Dimensions of Perfectionism and Appraisals of Falling Short of Standards across Feedback Conditions***

The present study was among the first to examine how perfectionism affects cognitive appraisals of falling short of standards in response to negative performance feedback, particularly with regards to comparing the domains of socially prescribed perfectionism and self-oriented perfectionism. This study adds to a growing body of research which appears to establish socially prescribed perfectionism as the more maladaptive counterpart to self-oriented perfectionism, which itself may make one vulnerable to maladaptive outcomes if activated by certain contexts. While socially prescribed perfectionism was found to be a vulnerability factor for appraisals of falling short of standards regardless of feedback condition, and thus was not found to affect the relationship of feedback condition and appraisals of falling short of standards, future research may wish to test if socially prescribed perfectionism affects the relationship of negative performance feedback and other appraisals. In particular, this dimension of perfectionism may increase anticipation of losing or upsetting close others, losing social support, decreasing in social standing, or facing social exclusion as a result of perceived negative performance. It is worth noting that the effect of self-oriented perfectionism on the relationship between feedback condition and appraisals of falling short of standards was small, perhaps indicating only minimal influence in the present study. The interactive effect of self-oriented perfectionism may be better understood through the use of a stronger, more ecologically valid manipulation or observation. For instance, one could examine the degree to which self-oriented perfectionism affects cognitive appraisals in response to midterm or final grades, or in response to an actual graduate entrance exam.

### ***Lack of Moderation by Positive Future Thinking***

Contextual models of the effects of negative performance feedback have remained scarce, and few have considered factors that may be protective in these pathways. Given the lack of significant moderation found in the present study, future research is advised to consider other antecedent factors that may be relevant to resilience in the face of negative performance feedback events, such as perceived and actual access to resources, perceived and actual access to social support, decreased emotional sensitivity, more positive biases in attention and recall, a positive problem-solving orientation, self-efficacy, grit, cognitive flexibility, trait self-enhancement, a sense of meaning and purpose in life, and a diverse repertoire of adaptive emotion regulation and coping strategies, among others. Given the numerous factors which may be implicated in resilience, it will be important to attend to theories of consequences of negative performance feedback events (e.g., Bandura, 1991; Carver & Scheier, 1981; Festinger, 1957; Higgins, 1987) in proposing possible protective factors. However, it may also be worth conceptualizing positive future thinking with greater control for or measurement of possible sources of qualitative heterogeneity, such as depth of processing, linguistic complexity, specificity, degree of importance or emotionality, and degree of certainty or believability of the occurrence of these events, among others.

### **Conclusion**

Negative performance feedback was found to predict greater demoralization, with this pathway primarily reflecting the way in which this feedback was appraised (i.e., as falling short of standards). Contrary to hypotheses, socially prescribed perfectionism did not affect the relationship between feedback condition and appraisals or between appraisals and demoralization. Instead, socially prescribed perfectionism presented as a vulnerability factor for

appraisals of falling short of standards regardless of feedback condition. In contrast, exploratory analyses indicated that self-oriented perfectionism did affect the relationship between feedback condition and appraisals; specifically, in the negative performance feedback condition, individuals experienced greater appraisals of falling short of standards as they reported greater self-oriented perfectionism. Similarly, positive future thinking did not affect the relationship between appraisals of falling short of standards and demoralization; however, these results highlight compelling directions for future research. Collectively, the present study adds to the growing literature on the transactional relationships between specific negative life events, cognitive appraisals, and self-oriented and socially prescribed perfectionism. These results begin to highlight factors that may warrant additional clinical and empirical attention in considering resilience in the face of negative performance feedback events.

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