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Self-complexity and reactivity to social support receipt

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Self-complexity and reactivity to social support receipt

by

Christine Perndorfer

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Self-complexity and reactivity to social support receipt
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December 6th, 2013

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Abstract

While several studies have shown that support receipt in self-relevant domains may bring about increases in distress by delivering inefficacy cues to the recipient (e.g., Bolger & Amarel, 2007; Burke & Goren, under revision), results also indicate that some individuals are still able to experience benefits of support receipt in self-relevant domains (Burke & Perndorfer, in prep.). The purpose of the present research was to examine whether self-complexity, which has been shown to moderate the relationship between stress and health and well-being, moderates reactivity to support receipt in self-relevant domains. Study 1 (N = 77) attempted to expand past research on self-complexity by introducing measures of the purported cognitive mechanisms by which self-complexity results in affective consequences. Study 2 (N = 77) examined whether self-complexity moderates reactivity to support receipt in self-relevant domains. The results of the analyses did not support the hypothesis that participants low or high in self-complexity react differently to either failure feedback or support receipt in self-relevant domains. While the studies were unable to replicate past studies of self-complexity or provide support for self-complexity moderating reactivity to support receipt, we believe that the novel measures and modified procedures described in this research are contributions to both the self-complexity and social support literature.

Self-complexity: A potential moderator of reactivity to social support receipt

Distress caused by both major life events (e.g., divorce, death of a spouse, job loss) and the accumulation of recent minor stressors is associated with both physical and mental health problems (see Dohrenwend & Dohrenwend, 1978; Kanner, Coyne, Shaefer, & Lazarus, 1980; Silver & Wortman, 1980; Thoits, 1983). While the relationship between stressful life events and physical and mental health problems is consistently observed, it is often only low to moderate, suggesting the existence of moderating variables that account for individual differences in vulnerability to stressful life events (Linville, 1980, 1987). Social support is perhaps the most widely studied process for reducing the impact of stress. While social support has been shown to moderate the relationship between stress and health and well-being, social support alone does not account for all of the variability in the link between stress and health outcomes, suggesting that other variables also moderate this relationship. Furthermore, studies of social support receipt have reported mixed outcomes, with support receipt sometimes leading to reduced distress (e.g., Abraído-Lanza, 2004), and sometimes leading to increased distress (e.g., Shrout, Herman, & Bolger, 2006).

Recent research suggests that the recipient's cognitive evaluations of the support behavior influence its impact (e.g., Bolger and Amarel, 2007; Bolger, Zuckerman, & Kessler, 2000), and that costs of support receipt are more likely to be seen in personally important domains (Burke & Goren, under revision; Burke and Perndorfer, in prep.). Burke and Perndorfer examined reactivity to support receipt in self-relevant as compared to less salient domains and found that participants experienced more distress following

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support receipt in a self-relevant domain as compared to a domain for which efficacy and autonomy were less important. However, participants in the study by Burke and Perndorfer varied substantially in their reactivity to support receipt in the self-relevant domain, with some experiencing strong benefits of support receipt while others experienced strong costs. The purpose of this thesis is to investigate one possibility for why individuals may vary in the impact of support receipt in a personally relevant domain. More specifically, we propose that self-complexity, another moderator of the relationship between stress and health and well-being (Linville, 1980, 1987), may account for this variability.

Social support

Four decades of research has linked social support to personal and relational outcomes, including mental and physical health (Barerra, 1986; Cohen & Wills, 1985; Cobb, 1976; House, Landis, & Umberson, 1988; Uchino, 2009). Much of the research linking social support to personal and relational outcomes has defined social support as the perception that one is loved and cared for by others, esteemed and valued, and part of a social network of mutual assistance and obligations (Cobb, 1976; Wills 1991). This definition conceptualizes perceived support or one's *belief* about the availability of supportive others in times of need. Research indicates that perceived support availability is not strongly related to amount of support received during times of stress (Haber, Cohen, Lucas, & Baltes, 2007). Instead, research suggests that perceived support is more closely related to global traits (e.g., self-esteem, control beliefs, attachment security) (Lakey & Drew, 1996; Uchino, 2009). Uchino (2009) describes this set of characteristics

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as a positive psychosocial profile that co-develops in the context of positive, early familial relationships. Furthermore, while perceived support is almost unequivocally associated with positive outcomes, studies of enacted support receipt, or the actual support individuals receive during times of stress, have reported positive, negative, and null associations with health and well-being (Gleason, Iida, Shrout, & Bolger, 2008; Miller, Smerglia, Gaudet, & Kitson, 1998; Revenson, Wollman, & Felton, 1983). Taken together this research suggests that perceived and enacted support are different constructs, with divergent influences on the stress-support-depression process.

Understanding costs of support

As previously stated, while perceived support has been almost unequivocally associated with positive outcomes, studies of enacted support have reported more mixed outcomes, with support receipt sometimes leading to reduced distress (e.g., Abraído-Lanza, 2004), and sometimes leading to increased distress (e.g., Shrout, Herman, & Bolger, 2006). Given the complexity and variety of supportive interactions, it is unlikely that a single mechanism will account for the mixed consequences that follow from support receipt. Several potential explanations for the mixed outcomes following support receipt have been proposed in the literature. Perhaps the most obvious explanation for the mixed outcomes following support belief is the poor execution of the supportive behavior by the provider. Poor execution of support delivery can occur when efforts to help backfire and result in interpersonal conflict between the support provider and recipient, when support delivery creates feelings of indebtedness and/or inequity in the recipient following support receipt, when there is a mismatch between the support behavior and the

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recipient's needs, or when there is emotional overinvolvement by the provider (Bolger & Amarel, 2007; Coyne, Wortman, & Lehman, 1988; Cutrona & Russel, 1990; Fisher, Nadler, & Whitcher-Alagna, 1982; Gleason et al., 2003; Seidman, Shrout, & Bolger, 2006). The mixed consequences that follow from support receipt, however, are not solely explained by the skill with which the provider executes support delivery. Evidence suggests that the support recipient also influences the consequences that follow from support behaviors.

In particular, recent research suggests that the recipient's interpretation of the supportive behavior also contributes to the consequences of support receipt (Bolger & Amarel, 2007; Christenfeld et al., 1997; Glynn, Christenfeld, & Gerin, 1999). For example, research on invisible support indicates that the same supportive behavior, delivery of helpful information, can increase or decrease distress depending on whether the same information is delivered as advice or as an offhand comment (Bolger & Amarel, 2007). Research by Christenfeld and colleagues (1997) and Glynn, Christenfeld, & Gerin (1999) indicates that the consequences of support receipt on mood and physiological arousal can depend on who delivers the supportive behavior – for instance, a friend vs. research confederate or a male vs. female research confederate. Because the support and stressors in these cases were the same, the differing consequences following support receipt were likely a result of how these contextual factors affected psychological experiences of the interaction.

The Experiences in Supportive Interactions (ESI) Model (Burke, Ignarri, & Goren; under revision) draws on general principles of social cognition to describe how

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the support recipient's active mental representations about the self and others can influence the cognitive appraisal of support receipt, thereby affecting personal and relational outcomes. Mental representations, or general knowledge structures developed over a lifetime of experience, act as a lens through which information is appraised and future expectancies are created. Because mental representations are created through a lifetime of experiences, they will vary from person to person. Furthermore, mental representations differ in their level of activation, depending on situational cues. The ESI model posits that support receipt triggers two meditational pathways that, in turn, influence the well-being of the support recipient: the tangible pathway and the cognitive pathway. The tangible pathway of the ESI Model refers to the tangible outcomes of the support behavior such as the degree to which the supportive behavior reduces the degree of threat brought on by the stressor. The tangible pathway of the ESI Model likely represents the primary purpose of the delivery of support by the provider and will result in a reduction in distress to the extent that the support behavior reduces the threat/challenge brought on by the stressor. This effect is present regardless of the recipient's psychological state or active mental representations.

The cognitive pathway of the ESI Model attempts to explain the conditions under which negative consequences may follow from support receipt. Supportive behaviors are ambiguous events that have the potential to convey mixed messages: that one is loved and cared for by others or that one's own efforts and abilities were insufficient (Burke, Ignarri, & Goren; under revision). The cognitive pathway of the ESI Model refers to the recipient's appraisal of the supportive behavior – that is, the appraisal and meaning

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derived from the support behavior. The cognitive appraisal of the support behavior should be generally positive in relation to both the provider and the relationship – that one is loved and cared for. However, support may reflect negatively on the self, suggesting that one's own efforts and abilities were insufficient.

According to the model, stress contexts that occur in domains irrelevant to one's sense of self are likely to lead to a positive appraisal of support receipt by the target individual such that the target views the provider's intentions as being supportive, loving, and caring. However, when the stress occurs in a domain that threatens a core aspect of the working self-concept, support receipt may deliver the sense that one's own abilities and efforts were insufficient, thereby increasing distress through this lowered self-evaluation. Therefore, according to this model, support receipt in domains for which efficacy and autonomy are important will be associated with costs through the delivery of inefficacy cues whereas the costs of support receipt should be minimal in domains for which efficacy and autonomy are unimportant.

Several existing studies support the premise of the ESI Model. Bolger and Amarel (2000, 2007) ran several studies in which they manipulated the visibility of support – that is, they examined the costs of visible support as compared to invisible support, or instances of support provision (as reported by the provider) that go unnoticed by the recipient. The authors found that visible support to a self-relevant stress context was associated with emotional costs not associated with invisible support (Bolger & Amarel, 2000). Furthermore, the authors found that visible support was associated with increased emotional reactivity to a self-relevant stress context because it communicated a sense of

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inefficacy to the participant (Bolger & Amarel, 2007). In two studies, Burke and Goren (under revision) investigated whether support imparted more costs when in a self-relevant domain and whether the consequences of support receipt can be explained by changes in self-evaluation. Using a daily diary study, the authors found that costs of support receipt became more prominent as a self-relevant stressor approached in time and that support receipt was more strongly linked to distress on days for which participants reported the most stressful aspect of the day as being related to the looming self-relevant stressor. In a second study, they manipulated the framing of a stressful task and the presence of support and found that participants experienced greater increases in distress following support receipt in a task framed as being self-relevant than did participants in the irrelevant task framing condition. The costs of support receipt in the self-relevant context were partially mediated by the strengthened link between support receipt and self-evaluation in the self-relevant context. This research supports the ESI Model in that support receipt in self-relevant domains was associated with greater increases in distress than was support receipt in irrelevant contexts and that this effect was in part explained by self-evaluation.

The studies just reviewed have primarily examined the consequences of support receipt in achievement domains. Most recently however, Burke and Perndorfer (in prep.) sought to examine the consequences following from support receipt in a more relational stress context: pregnancy. Past research shows that stress during pregnancy increases the risk for postpartum depression (O'Hara, 1989; O'Hara & Swain, 1996; Robertson et al., 2004; Yim et al., 2009). To the extent that pregnancy and motherhood are self-relevant domains for women, the ESI suggests that receiving support in these domains should

increase distress. If so, negative reactivity to support receipt may also be linked to risk for postpartum depression. We examined the consequences following from support receipt in motherhood-related as compared to motherhood-unrelated domains for a sample of pregnant women and how these consequences were related to depression symptoms at postpartum with a longitudinal diary study spanning from the sixth month of pregnancy to six weeks postpartum. We predicted that to the extent that motherhood is a domain for which efficacy and autonomy are important for pregnant women, receipt of motherhood-related support may entail costs not observed for less salient domains during this time. We found that receipt of motherhood-related support led to a greater increase in distress than did receipt of motherhood-unrelated support. Thus, the daily consequences of support receipt during pregnancy did depend on whether the support was motherhood-related or not. The analyses also revealed that women varied substantially in their reactivity to motherhood-related support receipt, such that some women experienced costs associated with motherhood-related support, while others experienced benefits. Furthermore, how strongly a given woman reacted to receiving motherhood-related support significantly predicted her phase three depression scores. Women who reacted more negatively to motherhood-related support receipt had, on average, higher depression scores at postpartum than did women who reacted less negatively to the same support, even adjusting for baseline depressive symptoms.

That women significantly varied in their reactivity to support receipt in a self-relevant domain and that this reactivity was significantly predictive of an important long-term outcome begs the question of what gives rise to this variability in reactivity to

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support receipt in self-relevant domains? Burke and Perndorfer (in prep.) did examine possible moderators of the variability in reactivity to support receipt in the self-relevant domain (e.g., self-esteem, intensive mothering beliefs), but none of the measured variables were able to explain the observed variability in reactions to this support. That none of the measured variables were able to explain this variability may have been due to the relatively low power of the study (we had only about 30 participants), or to the relatively low level of variability in several of these moderators. With a larger and more representative sample some of the measured variables may have more strongly predicted reactions to support receipt. However, the fact remains that something was giving rise to variability in reactions to support in this study and that this variability was related to postpartum depressive symptoms, prompting us to explore other possibilities.

Self-complexity

Another possible reason for the variability observed by Burke and Perndorfer (in prep.) is that women varied in how self-defining the motherhood domain was for them. While all women rated motherhood as being important to them, motherhood may have been more central in the self-representations of some women as compared to those of others, and, consequently, the cognitive evaluation and consequences of that support may also have varied. People possess a great amount of information about themselves as compared to other cognitive domains (Linville, 1980). The self is cognitively represented as a complex structure that develops to help organize and process this great amount of self-relevant information (Linville, 1980). Part of this complex structure involves representing the self in terms of multiple aspects (see Gergen, 1971; Gordon, 1968;

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James, 1892; Sullivan, 1953). For example, information about the self might be organized in terms of social roles (lawyer, tennis player, friend, mother), traits (extravert), physical features (slim), category membership (male, black), behavior (jogger), abilities (analytical), preferences (vegetarian), goals (professional success), autobiographical recollections (summers at the lake), and relations with others (loyal friend, nurturer, colleague), all representing multiple aspects of the self (Linville, 1980). Linville (1980) proposed that the self is cognitively represented in terms of such aspects, that self-aspects differ in the affect associated with them, that people differ in the degree of complexity of their self-representation, and that overall affect and self-appraisal are a function of the affect and self-appraisal associated with different aspects of the self.

Self-complexity refers to the degree of complexity of an individual's self-representation, which is a function of two factors: the number of aspects one uses to cognitively organize information about the self and the degree of relatedness among these aspects (Linville, 1980). Individuals' representations of the self will vary in terms of the number of self-aspects they use to organize their self-relevant knowledge, which is likely related to the number of actual roles he or she has in his/her life (Linville, 1980). The degree of relatedness of individuals' self-aspects refers to the degree that ups and downs of feelings about one aspect influence the ups and downs of feelings about another aspect (Linville, 1980). In other words, the relatedness of aspects refers to the degree to which an experience that activates one aspect also activates other aspects. The assumption made by Linville (1980) is that the impact of an experience related to one aspect spreads to other aspects depending on the strength of their relatedness. Both the degree to which

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actual events in the real world regarding different self-aspects are correlated and the *perceived* relatedness of self-aspects contribute to the degree of relatedness among aspects in the self-representation (Linville, 1980). Greater self-complexity will result from a large number of self-aspects that are independent of one another (in terms of both actual and perceived covariation) whereas lower self-complexity will result from a small number of self-aspects that are highly interdependent. Finally, Linville (1980) proposed that overall affect and self-appraisal are a weighted average of the affect and self-appraisal associated with one's individual aspects. Important or salient self-aspects receive more weight in this averaging process (Linville, 1980).

Linville (1980) proposed the self-complexity and affective extremity hypothesis, which posits that those lower in self-complexity will experience greater swings in affect and self-appraisal as compared to those higher in self-complexity. The rationale behind this hypothesis is best explained by considering the extreme case in which self-complexity involves a large number of aspects that are highly independent of one another. When self-complexity is comprised of a large number of aspects, an event that has an impact on a single aspect is less likely to influence overall affect and self-appraisal because this single aspect is a very small proportion of the total number of self-aspects that make up the cognitive representation of the self. Similarly, when self-complexity is comprised of aspects that are independent of one another, an event that has an impact on a single aspect is less likely to influence overall affect and self-appraisal because the impact of that event will have less "spill-over" from one aspect to others.

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In support of the self-complexity and affective extremity hypothesis, Linville (1980) found that those lower in self-complexity experienced greater swings in affect and self-appraisal following a failure or success experience. Similarly, results from a 2-week diary study in which participants completed an affect scale each day indicated that those lower in self-complexity experienced greater variability in affect during this 2-week period than did those higher in self-complexity (Linville, 1980). The results of these studies suggest that self-complexity buffers against the negative effects of stressful life events.

In 1987, Linville advanced research on self-complexity by examining the self-complexity buffering hypothesis – that is, greater self-complexity moderates the adverse impact of stress on depression and illness. In this way, Linville (1980, 1987) proposed that self-complexity is another possible moderator of the relationship between stress and physical and mental health. Results from the study support the buffering hypothesis – participants higher in self-complexity were less prone to depression, perceived stress, physical symptoms, and the occurrence of the flu and other illnesses following high levels of stressful events than were participants lower in self-complexity.

Much of the research on self-complexity has examined the individual difference factor's relationship with stress and coping (Dixon & Baumeister, 1991; Linville, 1980, 1987; Luo & Watkins, 2008). Results of self-complexity studies like those conducted by Linville (1980, 1987) are discussed in terms of self-complexity as a buffer against the negative effects of stress and as a moderator of the relationship between stressful life events and physical and mental health. Just as some individuals are more susceptible to

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the adverse consequences of stress, the results of Burke and Perndorfer (in prep.) suggest that some individuals are also more susceptible to the adverse consequences of support receipt in self-relevant domains. The purpose of this thesis was to test whether self-complexity explains variability in reactivity to support receipt in self-relevant domains, such as that observed by Burke and Perndorfer (in prep.).

Self-complexity and the consequences of support receipt

According to the ESI Model, support receipt in self-relevant domains is associated with costs by delivering the sense that one's own efforts and abilities were insufficient, thereby increasing distress through this lowered self-evaluation. In this sense, support receipt in self-relevant domains can be considered much like failure feedback in that it delivers inefficacy cues to the recipient. In the study by Linville (1980), following failure feedback, individuals lower in self-complexity experienced lower affect and more negative self-evaluation than those higher in self-complexity. Following from this research, to the extent that support receipt communicates failure or insufficient effort or ability in a self-relevant domain, individuals low in self-complexity should react more negatively than individuals high in self-complexity to such support. If so, self-complexity might explain at least some of the variability in responses to support receipt observed by Burke and Perndorfer (in prep.). While support receipt in a self-relevant domain (pregnancy and motherhood for a sample of pregnant women) was, on average, associated with a greater increase in distress than was support receipt in less salient domains (motherhood-unrelated support receipt), women significantly varied in their reactivity to support receipt in the self-relevant domain. Thus, although support

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receipt in a motherhood-related domain may have delivered the sense that one's own efforts and abilities were insufficient to all women, high self-complexity may have buffered against the negative effects of this support receipt for some women. Women low in self-complexity, however, likely experienced greater costs following from support receipt in a motherhood-related domain because the aspect of pregnancy/motherhood makes up a larger proportion of their overall self and is more related to other self-aspects of the self-representation.

In sum, we hypothesized that self-complexity, as defined by Linville (1980), would account for some of the variability in reactivity to support receipt in self-relevant domains, which in turn is predictive of long-term outcomes. In line with this hypothesis, individuals low in self-complexity should react more negatively to support receipt in self-relevant domains for the same reason they experience lower affect and more negative self-evaluations following failure feedback: a greater proportion of the overall self will be colored by the negative appraisal of support receipt due to both a lower number of aspects and/or greater "spill-over" from one aspect to others. While support receipt in self-relevant domains may still deliver inefficacy cues to individuals with high self-complexity, the domain in which the stress and support occur comprise a smaller proportion of their overall self and will be less related to other aspects than in individuals lower in self-complexity. Thus, the greater number of aspects possessed by individuals high in self-complexity and/or their independence acts as a buffer against the negative effects of support receipt in self-relevant domains on distress.

Mechanisms of self-complexity

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In spite of the evidence that self-complexity buffers the impact of stress and the theoretical propositions given for why it does so, the literature provides little evidence for the actual mechanisms by which self-complexity operates. Why might self-complexity, defined in terms of the number and degree of relatedness of self-aspects, result in affective consequences? One assumption of Linville's self-complexity affective extremity hypothesis (1980) is that overall affect and self-appraisal are a function of the affect and self-appraisal associated with different aspects of the self. Consider the case involving a large number of completely independent self-aspects and an event (such as failure feedback or support receipt in a self-relevant domain) that has an impact on a single relevant aspect. Since aspects are completely independent of one another, the impact of the event is limited to the affect and self-appraisal associated with this one aspect and therefore has less of an impact on overall affect and self-appraisal. Because this aspect is a very small proportion of the total number of identities that make up the self-representation, the total impact of the event on overall affect and self-appraisal is likely to be relatively small.

Linville (1980) argues that the perceived relatedness of different aspects, or the degree to which an experience that activates one aspect of the self also activates other aspects, will predict the degree of "spill-over" between different aspects. Roughly defined "spill-over" is the extent to which pleasant or unpleasant feelings about one part of the self result in pleasant or unpleasant feelings about other parts of the self-representation. The actual cognitive mechanism of this "spill-over," however, remains both undefined and unmeasured in the self-complexity literature. Linville (1980) suggests

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that it might involve a spreading activation process through a network involving self-aspects as semantic nodes and their associated affect nodes (Bower, 1981; Clark & Isen, 1982; as reported by Linville, 1980). A second goal of current study was to examine this spill-over process and other cognitive mechanisms by which self-complexity may result in affective consequences.

First considering the spill-over process, Linville's (1980) self-complexity and affective extremity hypothesis suggests that threatened identities will become infused with negativity, which then spills over into other identities related to the affected identity, leading to a larger overall shift in self-evaluation. That is, the impact of failure feedback in one aspect of the self will spread to other aspects depending on the strength of their relatedness. Conversely, the impact of success feedback in one aspect of the self will also spread to other closely related aspects. Linville (1980) proposed that overall affect and self-appraisal are a weighted average of the affect and self-appraisal associated with one's individual aspects. Important or salient self-aspects receive more weight in this averaging process (Linville, 1980). The independence of self-aspects in the structure of the self-representation of individuals with high self-complexity will buffer the negative consequences of failure feedback on overall affect and self-evaluation. The overall affect and self-appraisal of individuals low in self-complexity, however, will undergo a larger shift in evaluation due to the impact of the interrelatedness of self-aspects and spreading negativity in this averaging process. This shift will from here on be referred to as a change in evaluation. Self-aspects that are more closely related to the stress and support

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receipt domain will undergo a larger negative shift in their evaluation than will self-aspects more loosely related to the stress and support receipt domain.

Another mechanism by which self-complexity may exert its effects on affect and self-evaluation following failure feedback is through a reorganization of the structure of the self-representation. This reorganization will from here on be referred to as a change in centrality. That is, individuals may diminish the centrality of the threatened identity, at least temporarily. This reorganization may also involve increasing the centrality of one or several other identities in the structure of the self-representation. By reducing the centrality of the threatened identity, this identity will have less weight in the averaging process described by Linville (1980), thereby preserving overall affect and self-appraisal. Because of the greater number of self-aspects possessed by individuals high in self-complexity, these individuals are likely to have more flexibility in this reorganization process than would individuals low in self-complexity with fewer self-aspects. To this end, individuals high in self-complexity may be better equipped to escape the potentially negative consequences of support receipt by reducing the centrality of the threatened self-aspect and/or increasing the centrality of one or several other identities than would individuals low in self-complexity.

A third possibility is that those high in self-complexity have a compensatory process that bolsters the positivity of the non-threatened identities to minimize costs of failure feedback. This bolstering is also a change in evaluation, however, it involves increasing the positivity of non-threatened identities. By increasing the positivity of self-aspects other than the salient identity, the negativity of the threatened identity has less of

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an impact in the weighting and averaging process described by Linville (1980) that determines overall affect and self-representation. Again, individuals high in self-complexity may me more capable of this bolstering process than are individuals low in self-complexity due to the larger number of self-aspects they possess for which they can bolster the positivity of, thereby reducing the impact of failure feedback. All of these possibilities are examined in the current study. No hypotheses were made as to which of the above described mechanisms would account for the affective consequences of self-complexity as we believed that more than one or a combination of mechanisms might be involved in the relationship between self-complexity and health and well-being.

Current study

The present research aims to extend the literature on enacted support by examining self-complexity as a possible moderator of responses to support receipt in self-relevant domains. In addition, the current study attempts to add to the literature on self-complexity by directly examining the purported cognitive mechanisms by which self-complexity moderates affective reactions to negative stressful events. One plausible sequence is as follows. Receipt of support in a domain for which personal efficacy and autonomy are important may be interpreted by the recipient as indicating that his/her own efforts and abilities were insufficient (Burke, Ignarri, & Goren; under revision). Such negative feedback should lead to negative thoughts and feelings about the self, with the domain in which the negative stressful event occurs and the identity associated with that domain being particularly affected. The extent to which this failure feedback affects the recipient's overall affect and self-appraisal will depend on two factors: the extent to

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which failure feedback in the self-aspect related to the support domain represents the total self and the extent to which this negative event colors the affect and self-appraisal of all the aspects that make up the complete self-representation (Linville, 1980). Individuals with low self-complexity, who possess a low number of self-aspects and/or whose aspects are highly interrelated, should react more negatively to support receipt in a self-relevant domain as assessed by changes in affect and self-appraisal than should individuals with high self-complexity (Linville, 1980).

Following from this, to the extent that support receipt in self-relevant domains delivers the sense that one's own efforts and abilities were insufficient, self-complexity as an individual difference factor may account for some of the variability in the consequences that follow from support receipt in self-relevant domains (Burke and Perndorfer, in prep.). For people high in self-complexity, the impact of the negative appraisal of support receipt will be a smaller proportion of their total selves and more confined to the self-aspect associated with the salient domain and will therefore affect a smaller part of their self-representation. The unaffected self-aspects will serve as buffers against the negative effects of the stressful event on these individuals' overall affect and self-appraisal. For individuals low in self-complexity, however, the impact of the negative appraisal of support receipt will be a larger proportion of their total selves and this negativity will diffuse on to other aspects (change in evaluation) because of their interrelatedness. Individuals high in self-complexity may also be better equipped to escape the negative effects of support receipt in self-relevant domains by having the greater ability to reorganize the structure of their self-representation (change in centrality)

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and more self-aspects for which they can increase the positivity of (change in evaluation) to buffer the impact of the negative evaluation of support receipt in a self-relevant domain. The current studies test the prediction that individuals high in self-complexity will be less affected by failure feedback, or support receipt in self-relevant domains, and the purported cognitive mechanisms by which stressful events may differentially affect individuals high vs. low in self-complexity.

Pilot Testing

Pilot testing was performed using Amazon mTurk to examine the effectiveness of the novel self-complexity measure and the feasibility of a two-session self-complexity study that is entirely online. Because Study One does not include social support receipt or interaction with the experimenter, the original hopes were to run the study entirely online using Amazon mTurk workers. In total, 150 Amazon mTurk workers completed some form of a self-complexity measure. Several adjustments to the self-complexity measure were made during this pilot testing. The original self-complexity measure had participants provide a self-aspect and then select the traits relating to that self-aspect before moving on to define another self-aspect of their self-representation. We found that with this format, participants were not producing numbers of self-aspects comparable to past studies of self-complexity. That participants reported low numbers of self-aspects using the original format of the self-complexity measure was likely due to the nature of Amazon mTurk studies and their workers. That is, Amazon mTurk workers maximize their time and gain by completing studies quickly and likely realized that the trait selection and importance to identity questions followed each identity they provided and

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thus stopped listing identities quickly or did not think thoroughly about all of their potential self-aspects. The final self-complexity measure asked participants to spend two minutes thinking of all their self-aspects and had participants list all of their self-aspects at once before introducing the trait selection and importance to identity questions for each self-aspect. The instructions to the self-complexity measure were also changed during the pilot testing to further clarify what a self-aspect is and to garner a larger number of self-aspects listed by participants.

As previously mentioned, the pilot testing also served to examine the feasibility of a two-session self-complexity study that is entirely online. One hundred participants successfully completed the final measure of self-complexity, which garnered numbers of self-aspects typical of past self-complexity research. In order to customize the materials for part two of the study and to send this unique survey link to each participant the data from each participant's self-complexity measure had to be identified in some way. Participants were instructed to e-mail the lab with the unique ID code provided to them in the self-complexity measure. However, many participants failed to e-mail their ID code. Even when participants e-mailed the lab with their unique ID code it proved difficult to get these participants to complete part two of the study. These troubles resulted in a lot of sunken time and costs in terms of customizing the materials for each participant and compensating participants for the completion of the self-complexity measurement. In sum, the pilot testing done through Amazon mTurk helped to refine the self-complexity measure that was then used in both Study One and Study Two. The pilot testing in Amazon mTurk also discounted the feasibility of completing a two-part study online

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using Amazon mTurk workers, especially a study in which part two of the study is unique for each individual.

In addition to the pilot testing done online through Amazon mTurk, 25 participants were run through two variations of Study Two to finalize the procedures for the study. The participants for this pilot testing were students recruited from summer Psychology courses at Lehigh University and were compensated with extra credit towards their course grade. The purpose of the in lab pilot testing was to examine the validity of the speech task used in Study Two. The speech task used in Study Two is a variation of a standardized stress task in which participants are told that they will be writing and presenting a speech that will be video recorded. Typically, this task requires participants to write the speech. Instead, we had participants come up with 15 pieces of evidence for the speech, ostensibly as preparation for the eventual speech writing. We chose to have participants complete this variation of the speech task because we wanted the support manipulation to be in relation to the identity (i.e., support for not being able to come up with pieces of evidence as to why your self-relevant identity is important/beneficial) instead of being support for speech writing abilities. This pilot testing suggested that the variation of the speech task used in Study Two was effective in eliciting distress. Specifically, although the effects were not significant with such a small sample, each of the outcome variables was trending in the predicted direction, providing some confidence that the procedure was valid.

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Overview

The purpose of Study One was to replicate the results of past studies of self-complexity using novel measures and a modified procedure. Additionally, Study One provided the first opportunity to examine the purported cognitive mechanisms by which self-complexity may result in affective consequences.

In the first part of a two-part study, we assessed self-complexity and the importance of each self-aspect that subjects generated. In a separate laboratory session, participants completed an eclectic series of ambiguous and difficult tasks for which the self-relevance was manipulated. Participants then received either failure or success feedback regarding their performance on these tasks. Participants completed a mood measure, a global self-evaluation measure, and implicit centrality to identity and evaluation of identities measures both prior to and following the completion of the task block and receipt of failure/success feedback.

Using the novel measures and modified procedure, we expected to replicate the results of Linville (1980): individuals low in self-complexity should experience more extreme affect and self-evaluation following a failure or success experience than would individuals high in self-complexity. More specifically, we hypothesized that individuals low in self-complexity would experience more negative affect and self-evaluation following failure feedback than would individuals high in self-complexity. This increased negative affect experienced by individuals low in self-complexity after receiving failure feedback should be especially high for individuals in the self-relevant domain condition.

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That is, we expect participants low in self-complexity to react more negatively to failure feedback in a self-relevant domain than participants high in self-complexity. In contrast, individuals low in self-complexity will experience more positive affect and self-evaluation following success feedback than will individuals high in self-complexity. In addition, we expected to find that shifts in evaluation and identity centrality could help to explain the results from the self-report measures.

Method

Participants and design. Ninety Lehigh University undergraduate students participated as part of the research participation requirement for an introductory psychology course. Of the 90 participants originally recruited for the study, 77 completed both parts of the study successfully. Participants ranged in age from 18 to 22 (M = 18.9) with approximately 70 percent of the participants (N = 54) being female. The majority of participants identified themselves as being White (N = 74). Participants were compensated with 0.5 credits for each part of the two-part study completed to put towards their course research participation requirement.

The study had a 2 (task self-relevance: self-relevant or not self-relevant) x 2 (feedback: failure or success) experimental design, with self-complexity as a measured moderator. Participants were randomly assigned to one of the four conditions: self-relevant failure, self-relevant success, not self-relevant failure, or not self-relevant success. As previously mentioned, the study was a two-part study in which participants completed an online self-complexity measure that assessed participant demographics, self-complexity (both number of identities and their interrelatedness), and importance to

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identity prior to the laboratory session. The two-part nature of this study allowed the framing of the task block and implicit measure used in the laboratory session to be customized for each participant according to the data from the online self-complexity measure. Particularly, the self-aspects indicated as being a part of each individual's self-representation and the importance of these aspects were used to determine the framing of the task block and were incorporated into the implicit measure of change in centrality to identity and change in evaluation of identities.

Measures

Part one.

Self-complexity. The self-complexity measure used in this study was a novel measure, but loosely based on the traditional card sorting task used to measure self-complexity (Dixon & Baumeister, 1991; Linville, 1980, 1987; Luo & Watkins) and more recent forms of assessment (Brook, Garcia, & Fleming, 2008; Rafaeli-Mor, Gotlib, & Revelle, 1999) described in the self-complexity literature. The prompt for the self-complexity measure was borrowed from a study by Brook, Garcia, and Fleming (2008) on the effects of multiple identities on psychological well-being. The prompt read:

"We all have various aspects of our identity and how we think about ourselves. Some of these are related to groups, such as gender, race/ethnicity, religion, politics, nationality, sports teams, work, social/academic clubs, families, friends, and so forth. Others are related to roles such as student, sibling, parent, employee, friend, significant other, club or team member, and so on. For example, Christy is

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a friend, sister, African American, psychology major, member of the student council, member of the track team and member of a sorority.

Please pause for a minute or two to think about the roles and identities that are IMPORTANT TO YOU. Try to think of at least four. You can list as many as fifteen.

Please list your roles and identities below using one or two words. You can list the identities and roles in any order."

Participants were asked to list at least four self-aspects, but could list up to as many as 15. Four identities were required by each participant in order to make up the implicit measure for the laboratory session described in further detail below. The decision to create a ceiling of 15 identities was informed using the data from past studies on self-complexity (e.g., Brook, Garcia, & Fleming, 2008; Dixon & Baumeister, 1991; Linville, 1980, 1987). For example, Brook, Garcia, and Fleming (2008) reported that a sample of 159 undergraduates listed a range of zero to fifteen identities each, with a median of 6. Only 4.1% of this sample listen more than 12 identities, with only 9% listing 12 (Brook, Garcia, & Fleming, 2008).

To assess the interrelatedness of self-aspects, participants then chose traits relating to their role in each of the listed identities. The interrelatedness of self-aspects was measured by examining the degree of overlap between the traits chosen for each self-aspect. That is, more unique self-aspects will share fewer traits with other self-aspects. A more detailed explanation of how self-complexity was computed can be found in the Analytic Approach section of the Results section this study. Participants were instructed

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to choose at least two traits for each identity, that they did not need to choose all of the traits, and that they could use the same traits to describe their role in different identities. The 44 traits provided were the same as those used by Rafaeli-Mor, Gotlib, and Revelle (1999), who selected them to include markers of the Big-5 personality dimensions (Goldberg, 1991), as well as constructs that fall outside of that framework. The 44 traits consist of 23 positively valenced adjectives (e.g., optimistic, loyal, ambitious, considerate, helpful) and 21 negatively valenced adjectives (e.g., boring, selfish, lazy, unintelligent, immature). Taken together, the number of identities and traits provided for each created a self-complexity measure that took into account both the number of identities in the self-representation and their overlap.

Identity importance. The importance of each identity in representing the overall self was measured by both a rank order and the Importance to Identity subscale of the Collective Self-Esteem Scale (CSES; Luhtanen & Crocker, 1992). After listing all of the self-aspects that make up their self-representation, participants created a rank order these identities in the order of their importance in representing the overall self. Specifically, the prompt read as follows:

> "Earlier you were asked to think about the aspects of your identity that are important to you and were asked to list these identities and traits related to them. Some identities may be more important in representing ourselves than are others. Please rank order the identities you previously listed in the order of their importance in representing your overall self. Please form this list based on your own opinion of yourself."

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In addition to the rank order, participants also completed the four-item Importance to Identity subscale of the Collective Self-Esteem Scale (CSES; Luhtanen & Crocker, 1992) for each identity listed during the self-complexity measure. This subscale has been used to assess the importance of identities in representing the overall self in past research on self-complexity (Brook, Garcia, & Fleming, 2008). The piped text feature in Qualtrics inserted the name of each identity participants had listed in the self-complexity measure into each of the four items of this subscale. The four items read: "Overall, my identity [identity inserted here] has very little to do with how I feel about myself" (reversed), "The identity [insertion] is an important reflection of who I am," "The identity [insertion] is unimportant to my sense of what kind of person I am" (reversed), and "In general, the identity [insertion] is an important part of my self-image." Responses were made using a 7-point Likert scale ranging from *strongly disagree* (1) to *strong agree* (7). Responses to each of the four importance items were averaged for each identity to create an importance score for each identity. The Importance to Identity subscale provided an additional measure of the importance of various identities in representing the self rather than using the rank order to determine this alone.

Part two.

Mood. An adaptation to the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) was used to assess changes in mood following the task block and failure/success manipulation. The measure consists of 14 items that measure five target moods, each being represented by three or four items as follows: anxious mood (on edge, uneasy, and anxious), depressed mood (sad, discouraged, hopeless, and blue), anger

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(resentful, angry, and annoyed), fatigue (worn out, exhausted, and fatigued), and vigor (cheerful vigorous, and lively). Participants rated the extent to which they were experiencing the feelings at that moment along a computerized visual analog scale both before and after the task block and performance feedback. The visual analog scale appeared as a horizontal line on the computer screen with anchors at "not at all" and "extremely" and participants clicked the appropriate point along the line to indicate how they were feeling at that moment. Responses were recorded electronically with values in the range of 0 to 100, with higher values representing higher levels of the state. A visual analog scale was chosen over a Likert scale in order to detect more subtle changes in mood following the task block and feedback manipulation. Current distress was operationalized as the anxiety and depression subscales of the POMS. Responses to these seven items were averaged to form indices of current distress both before and after the task block and failure/success feedback in order to obtain mood change scores. In addition to distress, also relevant to the current research was the vigor subscale of the POMS. The POMS has been shown to be reliably sensitive to individual differences in individual mood changes over time (Cranford, Shrout, Iida, Rafaeli, Yip, & Bolger; 2006) and is the same mood measure used by Burke and Perndorfer (in prep.) to assess mood changes associated with support receipt in domains varying in self-relevance.

Self-evaluation. Self-esteem was assessed using the Rosenberg self-esteem scale (RSES; Rosenberg, 1965). The scale is a ten-item scale that measures state self-esteem by asking participants to respond how they are currently feeling. Items (e.g., On the whole I am satisfied with myself; I feel that I have a number of good qualities; I certainly feel

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useless at times) are answered on a four-point Likert scale ranging from *strongly agree* to *strongly disagree*. The RSES has been used in past studies of self-complexity (e.g., Luo & Watkins) and is the same self-evaluation measure used by Burke and Perndorfer (in prep.) to assess changes in self-evaluation associated with support receipt in domains varying in self-relevance.

Implicit centrality to identity and evaluation of identities. The implicit centrality to identity and evaluation of identities measure was used to examine the purported cognitive mechanisms by which self-complexity may result in affective consequences following negative stressful events. Specifically, the implicit centrality to identity and evaluation of identities measures were derived from an Implicit Association Task (IAT; Greenwald, Nosek, & Banaji, 2003) created using four "Me," or self-relevant identities and four "Not me," or not self-relevant identities for each participant. Please see the section titled Analytic Approach for more detail as to how the centrality to identity and evaluation of identity measure was scored to examine these cognitive mechanisms, and see Appendix A for more detail on how the "Me" and "Not me" identities were selected for each subject.

Procedure

Participants were randomly assigned to one of the four conditions: self-relevant failure, self-relevant success, not self-relevant failure, or not self-relevant success. All participants completed the self-complexity measure online through the web survey program Qualtrics approximately 1-2 weeks prior to the laboratory session. Rafaeli-Mor, Gotlib, and Revelle (1999) concluded through a split-half reliability analysis that all

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measures of self-complexity show strong temporal stability as long as the form of measurement includes both positively and negatively valenced items (as was included in our measurement of self-complexity).

Part two of the study consisted of a 30 minute in-lab session. The experimenter greeted participants upon entering the lab and presented them with the informed consent form. After signing the informed consent form participants were directed to a computer where they completed the pre-task mood, self-evaluation, and implicit centrality to identity and evaluation of identities measures before moving on to the task block. The mood measure, self-evaluation measure, task block, and performance feedback took place in the web survey program Qualtrics while the implicit centrality to identity and evaluation of identity measure was completed in DirectRT.

The task block and performance feedback for these tasks allowed for the manipulation of both self-relevance and failure/success. The introduction to the task block read as follows:

> "The next part of this survey contains a diverse array of exercises that we have developed to measure ability in a number of different dimensions within a short period of time.
> We ask that you try your best on all items. Upon completion of these tasks, your responses will be scored by our algorithms and you will receive feedback in the form of a percentile ranking relative to the others who have completed this battery of tests.

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Specifically, your percentile score will reflect your performance relative to all individuals who indicated [insert self-relevant or not-self relevant identity here] as being an important attribute domain in the original survey.

This may or may not be one of the domains you listed for yourself in the original survey."

As described, the task block was made up of an eclectic series of ambiguous and difficult tasks that participants were falsely led to believe were a measure of ability in a number of different domains. The task block was made up of a subword task, an alternative uses task, a task involving the assignment of traits to computerized faces, questions regarding one's disagreements and experiences in close relationships, and finally, a novel task claiming to be a test of hand-eye coordination and motor reflexes. All of these tasks will be described in further detail below.

The subword task is similar to an anagrams task, but diverges in that one can use some instead of all of the letters provided to form a word, or subword. The prompt for this task read:

"The following groups of letters can be rearranged to form a number of English words using either all or some of the letters. For each group of letters, you will have 30 seconds to generate as many words of at least three letters as you can. Your score for this task is based on number, length, and uniqueness of the words you generate.

For example, from the letters CEBRA, you could form the words brace, crab, care, bear, bar, arc, cab, etc."

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Participants were given two strings of letters (RECSNAPA and ALEIMCGNMOAA) and were instructed to come up with as many subwords for each of these strings of letters as possible within 30 seconds per string.

The alternative uses task was drawn from Guilford's Alternative Uses Task (1967), originally designed as a measure of flexibility in thinking in an investigation of creative thinking. In this task, participants were given a common object and were asked to list as many unconventional uses for that object as possible. For example, alternative uses for a brick could be a paperweight, a doorstop, a mock coffin at a Barbie funeral, to throw through a window, to use as a weapon, and to hit my sister with. Participants were asked to come up with as many alternative uses as possible for a paperclip and pillow, with a 30 second time limit imposed on the response time for each item. Participants were led to believe that their responses to these items would be scored based on four components: originality (uncommon responses relative to the responses provided by all participants), fluency (the number of alternative uses created), flexibility (the number of different categories of uses created; e.g., the uses "to use as a weapon" and "to hit my sister with" would be considered as part of the same category: weapon), and elaboration (the amount of detail provided in each response).

Next, participants completed a novel task that was portrayed as being a test of nonverbal sensitivity. For this task, participants were shown two computer generated faces and asked to rate the degree to which each of the faces portrayed a number of traits on a scale provided. Specifically, the description of the task read:

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"Now we will turn to a test of nonverbal sensitivity. We will test your accuracy in decoding nonverbal affective cues.

You will be asked to rate a series of computer generated faces on a number of traits. Please rate the degree to which you believe each face portrays the following traits on the scale provided: attractive, competent, trustworthy, dominant, mean, frightening, extraverted, threatening, and likeable.

Your response will be compared to normative ratings and expert evaluations to determine your score. You will have 10 seconds to view each face, followed by 20 seconds to make your ratings."

Participants rated the faces according to these traits on a visual analog scale similar to that used in the POMS. The two computer generated faces were chosen from a database of 300 Caucasian faces that were randomly generated using the Facegen Modeller program (http://facegen.com) Version 3.1. The exact procedures are described in Oosterhof and Todorov (2008).

Following the "test of nonverbal sensitivity," participants answered a series of questions regarding their disagreements and experiences in close relationships. First, participants rated the approximate extent of agreement or disagreement in general between them and their close others for a series of topics. Note that participants were told that the term "close others" is not restricted to romantic partners, but also includes family and friends. The topics for which participants rated their extent of agreement or disagreement with their close others were: financial matters, religion, aims, goals, and things believed to be important, and leisure time interests and activities. These topics

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were chosen to represent topics for which family and friends, instead of just romantic partners, may have disagreements over. Participants rated their extent of agreement or disagreement with their close others on these topics on a 6-point Likert scale ranging from *always agree* to *always disagree*. Second, participants rated how much they agreed or disagreed with a series of statements regarding how they generally experience close relationships. These statements were taken from the Experiences in Close Relationships Scale (Brennan, Clark, & Shaver, 1998) and were as follows: my close others make me doubt myself, my desire to be very close to people sometimes scares people away, it helps to turn to my close others in times of need, and I prefer not to show my close others how I feel deep down. Again, it was made clear that close relationships include romantic partners, family members, friends, etc. Participants rated their extent of agreement or disagreement with the above statements on a 7-point Likert scale ranging from *strongly disagree* to *strongly agree*.

Finally, participants completed a novel task claiming to be a measure of hand eye coordination and motor reflexes. The "motor task" required participants to use the computer mouse to click as close to the center of circles that would quickly appear and disappear in a random pattern across the computer screen. Participants were instructed that both their speed and accuracy would determine their overall score on this task.

While some of the tasks in the task block were inspired by real psychological measures it is important to note that the task block and the "measures" in it were not indicative of one's ability in any domain. In fact, participants' performance on these measures was never calculated nor examined. The importance of the task block was to

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create a difficult exercise that could be framed as being a measure of ability in a number of different domains as to accommodate the diversity of self-aspects generated by participants. The tasks incorporated in the task block were chosen to represent a number of different domains in which participants could have reported having roles and identities in. Such domains include academic/intelligence (i.e., the subword task), creativity (i.e., the alternative uses task), social/relational (i.e., the test of nonverbal sensitivity and the disagreements and experiences in close relationships questions), and athleticism/coordination domains (the hand eye coordinator and motor reflex task).

The framing of the task block and performance feedback was manipulated by leading participants to believe that their performance feedback on these tasks was a percentile ranking relative to all individuals who indicated a certain self-aspect as being an important attribute domain in the original survey. For participants in the self-relevant domain condition, this self-aspect was typically the first self-aspect listed in their rank order in the self-complexity measure. For example, a participant who indicated "math major" as being the most important self-aspect in representing the overall self was told that his/her performance on the task block was a percentile ranking relative to all individuals who indicated "math major" as being important to their self-representation. For participants in the not self-relevant domain condition this self-aspect was an identity from the same basic identity group as their first rank ordered identity, but an identity listed by another participant and not held by this particular participant and thus, not self-relevant. The exact procedures for the identity organization and selection are described in Appendix A. Participants in the success feedback condition were told that they scored in

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the 93rd percentile relative to individuals who listed the above described self-aspect as being an important attribute domain in the original survey. Participants in the failure feedback condition were told that they scored in the 15th percentile. To ensure that participants understood what "their score" meant the feedback included this description:

> "This percentile score is a ranking of your ability relative to these individuals. It gives the proportion of the population for which your ability level is higher in this domain, so a higher number represents a higher ability level."

Participants completed the mood, self-evaluation, and implicit centrality to identity and evaluation of identities measures a second time after completing the task block and receiving performance feedback. Participants were debriefed and thanked upon completion of the lab session.

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Results

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Analytic Approach

Self-complexity score. To compute self-complexity for each subject, the number of identities each participant listed as being a part of their self-representation was first collected from the rank order. Next, the total frequency that each of the 44 traits was chosen to describe participants' roles or identities was calculated. Remember that traits could be used more than once to describe different roles and identities. The uniqueness of each trait was calculated with the formula: $1 -$ (frequency of that trait $- 1$)/number of ids. Thus, traits that were used to describe more roles or identities received less weight than were traits used only once. These trait uniqueness scores could range between 1/15 (for a trait used to describe 15 out of 15 identities) to 1 (for a trait used only once). Then, the

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uniqueness of each identity was calculated by averaging the uniqueness scores for each of the traits selected for that identity. Thus, an identity was rated as more unique to the extent that its constituent traits were infrequently used to describe other identities. Finally, self-complexity was calculated by summing the uniqueness score for each identity to create a final self-complexity score. Thus, a participant who listed 15 identities and used unique identities to describe each identity would earn a high self-complexity score as compared to a participant who listed only four identities and chose the same trait to represent these roles.

Changes in the centrality of identities in representing the self and the evaluation of identities. Changes in the centrality of identities in representing the overall self and the evaluation of identities from pre to post was calculated using data from the "Me" / "Not me" IAT described earlier. The IAT was made up of seven blocks – two of which were used to calculate changes in the centrality of identities in representing the overall self from pre to post and four of which were used to calculate changes in the evaluation of identities from pre to post. Block two of the measure was not used in the analyses as this block only required participants to categorize words as being "good" or "bad" and thus did not include any information about participants' self-aspects. In line with the scoring algorithm described by Greenwald, Nosek, and Banaji (2003) all reaction times greater than 10 seconds were dropped from the analyses. Similarly, all reaction times less than 300 milliseconds were categorized as fast trials. The mean number of fast trials for each participant was calculated. The data was dropped for participants whose fast trials made up more than 10% of their responses. Per the

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recommendation of Greenwald et al., we retained incorrect trials, replacing their reaction times with the mean reaction time for correct trials for that subject plus a 600-millisecond penalty.

The logic behind the implicit centrality measure is that participants should more quickly categorize identities as being "Me" when they are in fact self-relevant identities and when these identities are more central to the overall representation of the self. We calculated implicit centrality to identity using the data from blocks one and five of the IAT. In these blocks, participants categorized the four "Me," or self-relevant and four "Not Me," or not self-relevant identities as being "Me" or "Not Me." The mean reaction time for each "Me" identity was calculated so that a mean reaction time existed for identities Me1, Me2, Me3 and Me4, with identity Me1 being the first identity listed in the rank order of importance in representing the overall self. The reaction times for the four "Not Me" identities were grouped together as one mean as there was no conceivable reason to examine the speed with which participants categorized different not self-relevant identities. Centrality to identity was calculated as how quickly, on average, one categorized that "Me" identity as compared to the average speed with which one categorized all of the "Not Me" identities (e.g., centrality of Me1 = average reaction time for "Not me" identities – average reaction time for Me1). We chose to incorporate the reaction time to "Not me" identities in this way to account for basic individual differences in speed of responding. Thus, higher numbers indicated greater centrality in representing the overall self. Change in centrality was calculated by subtracting the pre task centrality score from the post task centrality score. Negative change in centrality scores thus

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indicated a drop in the centrality of an identity from pre to post and positive change in centrality scores indicated an increase in the centrality of an identity in representing the overall self from pre to post.

Consistent with the logic behind a standard IAT, the logic behind the implicit evaluation measure is that participants should be more quick to categorize a "Me" identity as being self-relevant when the "Me" anchor is paired with "good" than when it is paired with "bad" to the extent that this identity is imbued with implicit positivity. We calculated implicit evaluation scores using blocks three, four, six, and seven of the IAT. Participants categorized both words as being "good" and "bad" and identities as being "Me" and "Not me" during these blocks. Blocks three and four were congruent trials in which the anchors "good" and "Me" were paired together while the anchors "bad" and "Not Me" were paired together. Blocks six and seven were incongruent trials in that "good" was no paired with "Not me" and "bad" with "Me." The change in the evaluation of identities scores were computed using a modification to the scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003) with the key difference being that rather than grouping the self-relevant, or "Me" identities together, we examined the change in the evaluation of identities separately for each "Me" identity (Me1, Me2, Me3, and Me4). Thus, we used a modified scoring algorithm to derive separate change in evaluation scores for each identity. Details regarding this modified scoring algorithm are available upon request.

Analyses. We used general linear models to examine the effect of self-complexity, self-relevance, and performance feedback and their interactions in predicting

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changes in the set of outcome variables described above. In each case, we adjusted for the average of the pre and post levels of the variable of interest. Both that average and self-complexity were centered at the grand mean before being entered into the analyses. The outcome variables were change in distress, change in self-evaluation, change in vigor, change in the centrality of the Me1 identity, change in the evaluation of the Me1 identity, change in the centrality of the Me2, Me3, and Me4 identities combined, and change in the evaluation of the Me2, Me3, and Me4 identities combined. The significant results from these analyses will be described below, and non-significant results are reported in Appendix B.

Results of analyses

Descriptive analyses. The mean number of self-aspects reported by participants in Study One was 6.99 with a standard deviation of 2.6. Although participants were instructed to list at least four self-aspects the minimum for the range of identities listed was three with the maximum being 15, or the ceiling. Men (M = 6.91) and women (M = 7.02) reported a similar number of identities. Using the calculation of self-complexity described in the Analytic Approach section above, which took both the number of self-aspects and their interrelatedness into account, participants in Study One had a mean self-complexity score of 4.58 with a standard deviation of 1.87. The range for the self-complexity scores of participants in Study One was 1.48 to 10.95. **Change in distress.** Looking first at change in distress, we expected to find a three-way interaction between self-complexity, self-relevance, and performance feedback, such that negative feedback in a self-relevant domain is less impactful for individuals high vs. low in self-complexity.

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The results of the analyses indicate that there were no significant main effects or interactions in predicting change in distress (Fs < 3.04, ps > .086). Figure 1 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in self-evaluation. We expected the same pattern of results for change in self-evaluation as we did for change in distress: a three-way interaction between self-complexity, self-relevance, and feedback, such that negative feedback in a self-relevant domain would be less impactful for individuals high as compared to individuals low in self-complexity. The results of the analyses indicate that there were no main effects of self-complexity, self-relevance, or performance feedback in predicting changes in self-evaluation (Fs < 1.28, ps > .253). Similarly, the two- and three-way interactions were also not significant (Fs < 014, ps > .705). Figure 2 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in vigor. We expected the pattern of results for change in vigor from pre to post to essentially be the opposite of that for change in distress and change in self-evaluation: a significant three-way interaction between self-complexity, self-relevance, and performance feedback such that positive feedback in a self-relevant domain would be less impactful for individuals high vs. low in self-complexity. The two-way interaction between self-complexity and performance feedback (F (1,67) = 11.24, p= .009) was significant. To better understand this interaction we reran the analyses two times, once with self-complexity centered one standard deviation below its mean and once with standard deviation centered above its mean. The simple effect of feedback was significant for participants both low (F(1,67) = 7.68, p=.007) and high in self-complexity (F(1,67) =

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4.05, $p=.048$). The simple effect of feedback, however, was in the opposite directions for participants low vs. high in self-complexity. That is, participants low in self-complexity exhibited a greater decrease in vigor associated with failure feedback whereas participants high in self-complexity exhibited a greater decrease in vigor associated with success feedback.

This two-way interaction was qualified by a significant three-way interaction between self-relevance, self-complexity, and performance feedback ($F(1,67) = 19.81$, $p < .0001$). To better understand this three-way interaction we first looked to see whether the simple two-way interaction of self-relevance by performance feedback was significant for both participants low and high in self-complexity. The results of the analyses indicated that the simple two-way interaction between self-relevance and feedback was significant for participants both low ($F(1,67) = 5.81$, $p=.019$) and high in self-complexity ($F(1, 67) = 15.28$, $p.0002$). To further probe this interaction we examined the simple effects feedback for the self-relevant and not self-relevant domain condition for participants both low and high in self-complexity. We found no effect of feedback regardless of self-complexity in the not self-relevant domain condition ($Fs < 2.18$, $ps > 0.144$). However, for the self-relevant domain condition, there were significant effects of performance feedback consistent with the two-way interaction described above. This finding suggests that the two-way interaction between self-complexity and performance feedback described above was driven by the self-relevant domain condition. None of the main effects or the remaining two-way interactions were significant ($Fs < 1.21$, $ps > .276$). Figure 3 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Change in the centrality of the Me1 identity in representing the overall self.

The change in the centrality of the Me1 identity and the results that follow were measured using the implicit centrality to identity and evaluation of identities task. This task was designed to examine the cognitive mechanisms by which self-complexity may result in affective consequences following failure or success feedback. No hypotheses were made as to which of the proposed mechanisms or results might be involved in the relationship between self-complexity and affective consequences. None of the predictors of change in the centrality of the Me1 identity were significant (Fs < 2.67, ps > .107). Figure 4 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the Me1 identity. As for the change in the centrality of Me1 in representing the overall self, we did not have specific predictions for the pattern of results for the change in the evaluation of the Me1 identity from pre to post. Neither the main effects of self-complexity, self-relevance, and performance feedback nor their interactions were predictive of change in evaluation of the Me1 identity from pre to post (Fs < 3.04, ps < .086). Figure 5 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self. The change in centrality scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining changes in the centrality of these three identities in representing the self to improve our power to detect a small effect. None of the main effects nor interactions were predictive of change in the

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centrality of the Me2, Me3, and Me4 identities combined in representing the overall self from pre to post (Fs < 3.48, ps > .067). Figure 6 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the M2, Me3, and Me4 identities combined. Similarly, the change in the evaluation scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining the changes in the evaluation of these non-focal identities. Of these analyses the main effect of performance feedback was significant (F (1,67) = 5.04, p = .028), such that participants in the failure feedback condition experienced a greater decrease in the evaluation of the Me2, Me3, and Me4 identities combined from pre to post than did participants in the success feedback condition. The remaining main effects and interactions, however, were not significant (Fs < 2.39, ps < .137). Figure 7 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Discussion

The self-complexity measure used in this study was a novel measure, but loosely based on the traditional card sorting task used to measure self-complexity (Dixon & Baumeister, 1991; Linville, 1980, 1987; Luo & Watkins) and more recent forms of assessment (Brook, Garcia, & Fleming, 2008; Rafaeli-Mor, Gotlib, & Revelle, 1999) described in the self-complexity literature. Results of descriptive analyses indicate that the mean number of self-aspects reported by participants was 6.99 with a standard deviation of 2.6. The range of identities reported by participants was 3-15. The number of self-aspects reported by participants in this study was comparable to data from past

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studies of self-complexity (e.g., Linville, 1980, 1987; Brook, Garcia, & Fleming, 2008). For example, Linville (1980) found participants to create an average of 6.83 feature groups in the traditional card sorting task with a range of 3-21. Similarly, Brook, Garcia, and Fleming (2008) found that on average, a sample of 159 undergraduates reported a range of 0-15 identities with a mean of 6. These results suggest that the self-complexity measure developed for this study was able to elicit similar numbers of roles and identities than past measures of self-complexity.

The prediction central to this thesis is that individuals low in self-complexity would react more negatively to failure feedback than would participants high in self-complexity, especially when that failure feedback occurred in a personally important domain. Negative reactivity to failure feedback was examined both in terms of changes in distress and changes in self-evaluation following the task block and performance feedback. Neither the two-way interaction between self-complexity and performance feedback nor the three-way interaction between self-complexity, self-relevance, and performance feedback was found to be significant in predicting changes in distress or changes in self-evaluation. These results indicate that Study One was unable to replicate the results of past studies of self-complexity – that individuals low in self-complexity experience more negative affect following failure feedback than do individuals high in self-complexity.

While the focus of this thesis is on reactivity to failure feedback, or support receipt, in self-relevant domains, the self-complexity affective extremity hypothesis put forth by Linville (1980) holds that participants low in self-complexity, because they

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experience more extreme affect in general following failure or success feedback, should also experience more positive reactivity to success feedback than would participants high in self-complexity. More positive reactivity to success feedback was measured in terms of changes in vigor as measured by the POMS, and changes in self-evaluation. The two-way interaction between self-complexity and performance feedback was significant, however the pattern of these data require further examination. Exploration of the two-way interaction revealed that while the effect of feedback was significant for participants both low and high in self-complexity, the patterns of results were in the opposite directions. Furthermore, the three-way interaction suggested that the two-way interaction was driven by the self-relevant domain condition. As expected, participants low in self-complexity experienced a significant decrease in vigor associated with failure feedback. These results are consistent with our prediction that participants low in self-complexity would experience more negative affect following failure feedback in a self-relevant domain than would participants high in self-complexity. However, analyses examining the effect of feedback for participants high in self-complexity reveal a puzzling result. Participants high in self-complexity experienced a significant decrease in vigor associated with success feedback in the self-relevant condition. Future studies may determine if these results are replicable. As reported above, the two-way interaction between self-complexity and performance feedback and the three-way interaction between self-complexity, self-relevance, and performance feedback in predicting changes in self-evaluation were also not significant. Thus, the results suggest that Study One was unable to corroborate the self-complexity affective extremity hypothesis (Linville, 1980), which

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holds that participants low in self-complexity will experience more extreme affect following both failure *and* success feedback.

The implicit centrality to identity and evaluation of identities measures were used to examine the purported cognitive mechanisms by which self-complexity may result in affective extremity. We hypothesized that the cognitive mechanisms responsible for the effect of self-complexity on affective extremity might include spill-over, or the degree to which feelings about an event related to one aspect of the self color the feelings about other aspects in the self-representation, changes in the centrality of identities in representing the overall self, and changes in the evaluation of identities. Specifically, we proposed that participants high in self-complexity might escape the negative effects of failure feedback, even in a personally important domain, by having less spill-over from the affected identity on to other aspects of the self, having the greater ability to reduce the centrality of the affected identity and/or increase the centrality of other identities in representing the self, and/or bolster the positivity of the evaluation of the unaffected identities to protect the overall self from negative evaluation. Of the analyses examining changes in the centrality of the Me1 identity, changes in the evaluation of the Me1 identity, changes in the centrality of the Me2, Me3, and Me4 identities combined, or changes in the evaluation of the Me2, Me3, and Me4 identities combined, only one significant effect emerged. In line with expectations, there was a significant main effect of performance feedback on the change in the evaluation of the Me2, Me3, and Me4 identities combined such that participants experienced a greater decrease in the evaluation of these identities in response to failure than in response to success feedback.

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While it is expected that participants might experience a decrease in the evaluation of their self-possessed identities in response to failure feedback, this is averaging across both self-complexity and self-relevance. These results suggest that participants did not increase or decrease the centrality of the focal identity in response to success or failure feedback, respectively, nor increase the centrality of the non-affected identities in representing the self following failure feedback. The results also suggest that participants did not change their evaluation of the Me1 identity following failure/success feedback. Thus, the cognitive mechanisms through which self-complexity has affected reactivity to failure/success feedback in past studies remain unexamined.

The purpose of Study One was to replicate the results of past studies of self-complexity using the novel measures and modified procedure described in this study. Additionally, Study One provided the first opportunity to examine the purported cognitive mechanisms by which self-complexity may result in affective consequences. Although a few significant effects emerged through data analysis, the pattern of results did not appear meaningful. A discussion as to why the results of this study do not replicate those of past studies of self-complexity, particularly Linville's work (1980) on self-complexity and affective extremity, can be found in the General Discussion.

Given that Study One was unable to replicate the findings of past studies of self-complexity, this hampers our ability to test these hypotheses in the context of support receipt in Study Two. However, we still had reason to believe that Study Two could provide support for our hypotheses. As described in more detail in the General Discussion, an important limitation of Study One is that the task block may not have been

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plausible as being a measure of ability in a number of different domains. While we attempted to combat this possibility by using an eclectic series of tasks including tasks resembling real psychological measures and by the nature in which we provided performance feedback, this limitation remains a possibility. Compared to the novel task block, the stressful speech task used in Study Two closely resembles those used to create a self-relevant stress context in past studies on the costs of support receipt (Bolger & Amarel, 2007). We therefore had reason to believe that the stressful speech task used to manipulate self-relevance and the self-relevance of the support manipulation in Study Two might better manipulate the relevant constructs.

<div align="center">**Study Two**</div>

Overview

Study Two was designed to test the moderating effect of self-complexity on affect and self-appraisal in response to support receipt in a self-relevant domain delivered in an experimental setting. The study also attempted to examine the cognitive mechanisms by which self-complexity moderates affect and self-appraisal following negative stressful events. Study Two follows the same basic procedure as Study One except that the task block and failure/success feedback was replaced with a stressful speech task and support receipt manipulation. Like the task block, the self-relevance of the stressful speech task was manipulated using either self-aspects provided by that participant (self-relevant) or those provided by other participants (not self-relevant). As in Study One, participants completed a mood measure, a global self-evaluation measure, and an implicit centrality to identity and evaluation of identities measure both prior to and following the speech task

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and support receipt manipulation. These pre and post measures and tasks are the same as those described in Study One.

Method

Participants and design

Ninety Lehigh University undergraduate students participated as part of their research participation requirement for an introductory psychology course. Of the 90 participants originally recruited for the study, 77 completed both parts of the study successfully. Participants ranged in age from 18 to 23 ($M = 18.78$) with approximately 60 percent of the participants ($N = 54$) being female and approximately 40 participants being male ($N = 23$). The majority of participants identified themselves as being White ($N = 44$) with 20 identifying as being Asian. Participants were compensated with 0.5 credits for each part of the two-part study completed to put towards their course research participation requirement.

Measures

All of the measures used in Study Two are the same as those described and used in Study One.

Procedure

Participants were randomly assigned to one of the four conditions: self-relevant support receipt, self-relevant no support, not self-relevant support receipt, or not self-relevant no support. All participants completed the self-complexity measure online through the web survey program Qualtrics approximately 1-2 weeks prior to the laboratory session.

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Part two of the study consisted of a 30-minute in lab session. The experimenter greeted participants upon entering the lab and presented them with the informed consent form. After signing the informed consent form participants were directed to a back room with a computer to complete the mood, self-evaluation, and implicit centrality to identity and evaluation of identities measures for the first time. The back room also had a video camera set up as to make the speech task scenario more believable. The mood and self-evaluation measures were completed in the web survey program Qualtrics while the implicit measure was completed in DirectRT. After completing the pre-task measures, the experimenter introduced the speech task to participants, went over the general instructions, instructed the participant to read the directions carefully, set the timer for five minutes, and told the participant that she would be back when the timer went off. The experimenter then left the room so that the participant could complete the speech task.

The speech task took the place of the task block used in Study One in order to create a difficult task whose self-relevance could be manipulated and for which practical support could be offered from an experimenter. Participants were first made aware that their participation would include writing and presenting a speech on a topic of personal importance while reading the informed consent form. In reality participants never had to write and present an actual speech, but they did complete a stressful task described as preparation for the writing and presenting of the speech. The instructions for the speech task were as follows:

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"In the next part of the study, you will prepare and deliver a short speech, which will be video-recorded for later evaluation. The purpose of this speech is for you to describe, in a way that is persuasive and convincing, the importance and benefits of a particular social role or identity. The role or identity you will be asked to comment on may or may not be one of the ones that you listed in the previous survey that you completed about a week ago. The speech should be approximately 5 minutes in length.

Specifically, we would like you to comment on the following role or identity: [insert self-relevant or not self-relevant self-aspect].

As preparation for your speech, we ask that you come up with FIFTEEN reasons, or pieces of evidence, why the assigned role or identity is important or beneficial to the individual possessing that identity, his or her family and friends, or society as a whole. This exercise will help you later in your speech writing so it is important you generate fifteen well thought-out and concrete examples.

We will now give you 5 minutes to come up with fifteen reasons why the social identity or role below is important or beneficial. Please write them in the space provided below and on the back of this page. Please use the full 5 minutes. If you finish sooner, go back to your responses and try to make them even stronger. The experimenter will come to you when the time is up."

The decision to instruct participants to come up with 15 reasons or pieces of evidence why the given social role or identity is important or beneficial was informed using the results of the study by Schwarz and colleagues (1991) on ease of retrieval as

information. Schwarz and colleagues found that people pay attention to the subjective experience of ease or difficulty of recall in drawing inferences from recalled content. More specifically, the authors found that participants attributed themselves higher assertiveness after recalling six rather than 12 examples of assertive behavior and lower assertiveness after recalling six rather than 12 examples of unassertive behavior. Schwarz and colleagues concluded that it is difficult for participants to conclude that they are assertive (or unassertive) when it is so difficult to recall the requested number of examples. We asked participants to come up with 15 reasons why the given social role or identity is important to make the self-relevant task difficult enough to be stressful and not bolster their association with or positive association with that particular identity before receiving the support manipulation. Participants in the self-relevant domain condition completed the speech task for their first rank ordered identity. Participants in the not self-relevant domain condition completed the speech task for an identity that was in the same basic group as their first identity, but not one provided by the participant nor a clear cut or stereotypical opposite of their self-aspect. These identities and the four "Me" and "Not Me" identities for the implicit centrality to identity and evaluation of identities measure were chosen in the same manner as described in Appendix A.

The experimenter re-entered the room upon hearing the timer go off, marking the end of the speech task. Practical support was offered to participants in the support receipt condition by way of the experimenter offering a strategy suggestion upon re-entering the room. The strategy suggestion was as follows:

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"Okay, your time for this part is up. I don't know if this will be helpful, but a good way to come up with points for the speech is to think about what you would say if you were trying to convince a friend how important the social role or identity is."

This support was intended to be non-evaluative in that the experimenter was instructed not to examine the participants' responses to the speech task before offering the support to participants in this condition. The experimenter then informed all participants that they would be completing some of the same measures they had on the computer earlier before moving on to write and present the speech. After completing the mood, self-evaluation, and implicit centrality to identity and evaluation of identities measures again participants were informed through Qualtrics that they would not have to write and present the speech and that the experiment had reached its conclusion. Upon completing the post-task measures participants were debriefed and thanked.

Results

Analytic Approach

Self-complexity, changes in the centrality of identities in representing the overall self from pre to post, and changes in the evaluation of identities from pre to post were calculated in the same way as described in the Analytic Approach section of Study One. The analyses of Study Two parallel those of Study One with support receipt replacing performance feedback. Similarly, we expected the same pattern of results for Study Two as we did for Study One, again with support receipt replacing performance feedback as a main effect and in the interactions. As in Study One, only the significant results from the

analyses will be described in the Results section. Non-significant results of Study Two can be found in Appendix C.

Results of analyses

Descriptive analyses. The mean number of self-aspects reported by participants in Study Two (M = 6.71) was similar to that in Study One (M = 6.99) with a standard deviation of 2.38. Again, although participants were instructed to list at least four self-aspects the minimum for the range of identities listed was three with the maximum being 15, or the ceiling. Men (M = 6.06) and women (M = 7.15) reported a similar number of identities. Using the self-complexity calculation described in the Analytic Approach of Study One, participants of Study Two had a mean complexity score of 4.58 with a standard deviation of 1.94. The mean and standard deviation for this sample of participants is comparable to the data from the participants of Study One. The range of self-complexity scores for participants in Study Two was 1.62 to 13.61. Men (M= 4.24) and women (M = 4.82) had comparable self-complexity scores, although the ceiling for the range for women (13.61) was a bit higher than that for men (9.00) for men.

Changes in distress. We expected a three-way interaction between self-complexity, self-relevance, and support receipt in predicting changes in distress such that failure feedback in a self-relevant domain would be more impactful for participants low vs. high in self-complexity. Neither the main effects of self-complexity, self-relevance, and support receipt nor their interactions were predictive of change in distress from pre to post (*F*s < 1.47, *p*s <.88). Figure 8 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Changes in self-evaluation. The expected pattern of results for change in self-evaluation from pre to post paralleled those expected for change in distress: a significant three-way interaction between self-complexity, self-relevance, and support receipt wherein participants low in self-complexity would be more impacted by support receipt in a self-relevant domain than would participants low in self-complexity. The results of the analyses indicate no main effect of self-complexity, self-relevance, or support receipt in predicting changes in self-evaluation (Fs < .79, ps < .377). Similarly, none of the two-way interactions or the three-way interaction was significant (Fs < 1.24, ps < .270). Figure 9 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Changes in vigor. We also expected a three-way interaction between self-complexity, self-relevance, and support receipt in predicting changes in vigor. However, we expected the pattern of results for the change in vigor to be opposite of that for the change in distress and self-evaluation – participants high in self-complexity would be less impacted by support receipt in a self-relevant domain than would participants high in self-complexity. Unlike in Study One, none of the main effects or interactions was significant in predicting changes in vigor across the study (Fs < 2.98, ps < .089). Figure 10 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me1 identity in representing the overall self. The change in the centrality of the Me1 identity in representing the overall self and the results that follow were measured using the implicit centrality to identity and evaluation

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of identity task. As in Study One, no predictions were made for the results of the implicit measure. Self-complexity, self-relevance, and support receipt and their interactions were not predictive of the change in the centrality of the Me1 identity from pre to post ($Fs < 3.83$, $ps < .055$). Figure 11 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the Me1 identity. In the analysis performed to examine the change in the evaluation of the Me1 identity from pre to post, the main effect of self-complexity was significant such that participants low in self-complexity experienced a greater decrease in the evaluation of the Me1 identity from pre to post than did participants high in self-complexity ($F (1,67) = 8.30$, $p = .0005$). The two-way interaction between self-complexity and self-relevance was also significant ($F (1,67) = 5.20$, $p = .026$). To better understand this two-way interaction we reran the analyses two times, once with self-complexity centered one standard deviation below its mean and once with self-complexity centered one standard deviation above its mean. The simple main effect of self-relevance was significant for participants low in self-complexity ($F(1,67) = $, $p <.05$) such that participants in the self-relevant domain condition decreased the evaluation of their Me1 identity to a greater degree than did participants in the not self-relevant domain condition. The simple main effect of self-relevance was not significant for participants high in self-complexity ($F(1,67) = $, $p =0.3641$). None of the remaining results were significant ($Fs < 1.51$, $ps < .223$). Figure 12 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self. The change in centrality scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining changes in the centrality of these three identities in representing the self to improve our power to detect a small effect. The results of the analysis indicate a significant main effect of support receipt (F (1,67) = 5.59, p =.021), such that participants who received support increased the centrality of the Me2, Me3, and Me4 identities combined greater than did participants who did not receive support. None of the remaining effects were significant (Fs < .93, ps < .339). Figure 13 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the Me2, Me3, and Me4 identities combined. In the analysis examining predictors of the change in the evaluation of the Me2, Me3, and Me4 identities combined from pre to post, only the three-way interaction was significant (F (1,67) = 4.26, p = .043). To better understand this three-way interaction we first examined whether the simple two-way interaction between self-relevance and support receipt was significant for participants both low and high in self-complexity. The two-way interaction between self-relevance and support receipt was marginally significant for participants high in self-complexity (F(1,67) = 3.54, p=0.064), but it was not significant for participants low in self-complexity (F(1,67) = 1.52, p = 0.222). To further probe this interaction, we examined the simple main effects of feedback for the self-relevant and not self-relevant domain condition for only participants high in self-complexity. The effect of feedback was significant in the not self-relevant domain condition for participants high in

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self-complexity ($F(1, 67)= 4.15$, $p=.046$), such that participants had a greater decrease in the evaluation of the Me2, Me3, and Me4 identities combined associated with failure feedback than with success feedback. The effect of feedback was not significant in the self-relevant domain condition for participants high in self-complexity ($F(1,67) = 0.75$, $p=0.390$). None of the main effects or two-way interactions was predictive of the change in the evaluation of these identities from pre to post (Fs < 1.39, ps < .243). Figure 14 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Discussion

Participants in Study Two, like participants in Study One, reported a range (3-21) and mean number of identities (M = 6.71) similar to the data from past studies of self-complexity (e.g., Linville, 1980, 1987; Brook, Garcia, & Fleming, 2008). These results suggest that the self-complexity measure developed for these two studies was able to elicit a similar range and number of responses from participants in reporting their self-aspects.

The prediction central to this thesis is that individuals low in self-complexity would react more negatively to support receipt in a self-relevant domain that would participants high in self-complexity. Negative reactivity to support receipt in a self-relevant domain was examined both in terms of changes in distress and changes in self-evaluation following the stressful speech task and support manipulation. The three-way interaction between self-complexity, self-relevance, and support receipt was not found to

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be predictive of changes in distress and self-evaluation following the stressful speech task and support manipulation.

As in Study One, another goal of this study was to examine the purported cognitive mechanisms by which self-complexity may results in affective consequences. In examining the results of the implicit task, there was a significant two-way interaction between self-complexity and self-relevance in predicting the change in the evaluation of the Me1 identity. Further exploration of this result revealed that the simple main effect of self-relevance was only significant for participants low as compared to high in self-complexity. Participants low in self-complexity decreased the evaluation of their Me1 identity in the self-relevant domain condition. This result reveals little about the cognitive mechanisms by which self-complexity may operate as there was no significant effect of support receipt. In looking at the change in the centrality of the Me2, Me3, and Me4 identities combined, there was a significant main effect of support receipt such that participants experienced a greater increase in the centrality of these identities following support than if they received no support. Without an interaction with self-relevance this result reveals little about the mechanism by which self-complexity may operate. Finally, there was a significant three-way interaction between self-complexity, self-relevance, and support receipt in predicting the change in the evaluation of the Me2, Me3, and Me4 identities. Further exploration of this interaction revealed that the two-way interaction between self-relevance and support receipt was only marginally significant for participants high in self-complexity. For participants high in self-complexity, the simple main effect of feedback was significant in the not self-relevant domain condition such

that participants experienced a decrease in evaluation associated with support receipt. Thus, while significant effects emerged in the analyses of the results of the implicit task, the pattern of results did not provide a meaningful explanation as to how self-complexity may operate.

The purpose of Study Two was to examine whether self-complexity moderates reactivity to support receipt in self-relevant domains. Additionally, Study Two attempted to examine the cognitive mechanisms by which self-complexity may moderate affective reactions. Similar to Study One, although a few significant effects emerged through data analyses, the patterns were not in the predicted direction nor did they form a meaningful pattern.

General Discussion

The central prediction of this thesis is that self-complexity, a moderator of the relationship between health and well-being, may account for some of the variability in reactivity to support receipt in self-relevant domains. While several studies support the ESI Model (Burke, Ignarri, & Goren, under revision) in that costs of support receipt are more likely to occur in self-relevant domains and that these costs are in part explained by decreased perceptions of self-efficacy, the relationship between support receipt in self-relevant domains and its outcomes is not as clear cut. Burke and Perndorfer (in prep.) found that while, on average, participants reacted more negatively to support receipt in a self-relevant domain than to support receipt in domains for which personal efficacy and autonomy were less important, not all participants experienced costs following this support receipt. That is, while some participants experienced strong costs of support

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receipt in a self-relevant domain, some were still able to experience strong benefits. This begs the question of what gives rise to this variability in support receipt in self-relevant domains. The ESI Model postulates that support receipt in self-relevant domains can be interpreted much like failure feedback, in that it can deliver the sense that one's own efforts and abilities were insufficient. The design and hypotheses of this research flowed from the comparison between failure feedback and support receipt in self-relevant domains that both have the ability to delivery inefficacy cues to the recipient. We hypothesized that participants low in self-complexity would react more negatively to support receipt in self-relevant domains, much like they reacted more negatively to failure feedback in past studies of self-complexity as compared to participants high in self-complexity.

The purpose of Study One was to replicate the results of past studies on self-complexity, namely that participants low in self-complexity react more negatively to failure feedback than do participants high in self-complexity using novel measures, modified procedures, and incorporating a manipulation of self-relevance. Study One did not support the self-complexity affective extremity hypothesis (Linville, 1980). That is, participants low in self-complexity did not report more distress or lowered self-evaluation following failure feedback nor did they report more vigor or increased self-evaluation following success feedback than did participants high in self-complexity. The self-relevance of the domain in which the stress and performance feedback occurred did not alter any of these relationships. Because the results of Study One, which aimed to test the validity of novel measures and a modified procedure within the self-complexity literature,

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did not replicate the results of past studies of self-complexity, it hampered our ability to test the prediction that participants low in self-complexity would react more negatively to support receipt in self-relevant domains. The results of Study Two did not support our hypothesis that individuals low in self-complexity would react more negatively to support receipt in self-relevant domains than would participants high in self-complexity. That the results of Study Two do not support this hypothesis is not surprising given that the novel measures and modified procedures tested in Study One were unable to replicate the results of past studies of self-complexity before introducing the support manipulation.

Another goal of this thesis was to examine the purported cognitive mechanisms by which self-complexity may result in affective reactions. Linville (1980) argues that the perceived relatedness of different aspects, or the degree to which an experience that activates one aspect of the self also activates other aspects, will predict the degree of "spill-over" between different aspects. Roughly defined "spill-over" is the extent to which pleasant or unpleasant feelings about one part of the self result in pleasant or unpleasant feelings about other parts of the self-representation. The actual cognitive mechanism of this "spill-over," however, remained both undefined and unmeasured in the self-complexity literature. We proposed three possible cognitive mechanisms that might explain how self-complexity moderates affective outcomes following failure or success feedback. First, positive or negative feelings about the focal identity may diffuse on to the feelings one has about other self-aspects, thereby affecting overall affect and self-appraisal. This cognitive mechanism most closely resembles the "spill-over" described by Linville (1980). Identities more closely related in terms of both actual and

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perceived covariation are likely to be more affected in this spill-over process than are identities less interrelated with the focal identity. This cognitive mechanism went largely unexamined in this research. While we did measure changes in the evaluation of identities Me2, Me3, and Me4 combined following failure/success feedback or support receipt in self-relevant or not self-relevant domains we did not calculate interrelatedness scores for each of these identities and the focal identity to see if more interrelated identities were more affected than were others. We decided on this course due to the labor-intensive nature of computing these interrelatedness scores and the failure to replicate past research with the more conventional outcome variables. That there was no main effect of performance feedback or support receipt in a self-relevant domain on the change in the evaluation of both the focal and the non-focal identities, however, suggests that this "spill-over" was not demonstrated in these studies.

The second cognitive mechanism we examined as to why self-complexity may moderate affective reactions to negative stressful events is a reorganization of the structure of the self-representation. That is, participants may decrease the centrality of the focal identity and/or increase the centrality of other self-aspects in representing the overall self in response to failure feedback. We predicted that participants high in self-complexity, due to the larger number of self-aspects held within their self-representation, would have more flexibility in this reorganization, which may in part explain why these individuals have been better able to escape the costs of failure feedback in past studies than were individuals low in self-complexity. The results of both Study One and Study Two, however, do not show evidence of this cognitive mechanism being at play.

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Participants did not decrease the centrality of the focal identity in response to failure feedback or support receipt in a self-relevant domain nor did they increase the centrality of the non-focal identities in representing the self.

The third and final cognitive mechanism examined in this research is that of a change in the evaluation of identities. We proposed that following failure feedback or support receipt in a self-relevant domain, participants may increase the positivity of the unaffected domains, thereby buffering the effect the negative event has on overall affect and self-evaluation. Again, participants high in self-complexity were believed to have more flexibility in this process in that they have more identities for which they can increase the positivity of, thereby reducing the effect of the negative event on overall affect and self-evaluation. The results of Study One and Study Two, however, do not suggest that participants changed the evaluation of the focal or three non-focal identities following failure/success feedback or support receipt in a self-relevant domain, no matter their level of self-complexity.

Limitations

The self-complexity measure and procedure for calculating participants' self-complexity were designed for these studies, but loosely based on the traditional card sort sorting task used to measure self-complexity (Dixon & Baumeister, 1991; Linville, 1980, 1987; Luo & Watkins) and more recent forms of assessment (Brook, Garcia, & Fleming, 2008; Rafaeli-Mor, Gotlib, & Revelle, 1999) described in the self-complexity literature. That participants in both Study One and Study Two listed numbers of identities both similar to past studies of self-complexity (e.g., Brook, Garcia, & Fleming, 2008; Linville,

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1980, 1987) and similar to one another suggests that the pilot testing was effective in creating a self-complexity measure that elicited participants' true number of self-aspects. Thus, a limitation in the study may lie in our novel procedure for calculating participants' self-complexity scores.

Many studies of self-complexity utilize Linville's *H* statistic (Linville. 1980) in calculating self-complexity scores. Linville's *H* statistic was defined as the minimum number of independent binary attributes needed to reproduce the trait sort used by Linville (1980. 1987) to measure self-complexity and claimed to assess both the number of self-aspects and their interrelatedness. More recently, however, evaluations of the *H* statistic have revealed this measure to be highly related to the number of aspects, but not indicative of the interrelatedness or overlap of self-aspects (Luo, Watkins, & Lam, 2008; Rafaeli-Mor, Gotlib, & Revelle, 1999). This finding has left researchers of self-complexity in search of a new way of calculating self-complexity that taps both the number of identities in the self-representation and their overlap. We believe that our procedure for calculating self-complexity scores takes into account both the number of self-aspects and their interrelatedness by examining the uniqueness of each identity as compared to others. The uniqueness of each identity was a measure of the uniqueness of the traits chosen to describe that identity. The procedure we devised for calculating self-complexity resulted in a participant with more self-aspects and who used different traits to describe each self-aspect having a higher self-complexity score as compared to a participant with fewer self-aspects and who used the same traits to describe each of these identities.

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Because the procedure we used for calculating self-complexity was novel to this research we also ran our analyses with a more crude measure of self-complexity: number of identities. Past studies of self-complexity have also examined the validity of using the number of identities as a crude measure of self-complexity (Linville. 1987). While, the number of identities fails to adjust for the redundancy of traits chosen to describe those self-aspects, correlation analyses indicated that self-complexity scores and number of identities were highly correlated (r = .848, *p* < .05). Additional analyses were run that parallel those already reported. Analyses utilizing a simple count of the number of identities reported by each participant also did not reveal any significant effects in the predicted directions. Thus, it is unlikely that inability of Study One to replicate the results of past studies of self-complexity due entirely to our novel procedure for calculating participants' self-complexity scores.

Like our novel procedure for calculating self-complexity, we also developed a novel measure of self-complexity for this research. Our measure of self-complexity was more serial in nature in that participants had to first list all of their self-aspects before moving on to define their roles and identities in terms of traits as compared to the holistic nature of the card sorting task used in traditional studies of self-complexity. One possible flaw of our self-complexity measure is that participants did not have the option of returning to their list to add more self-aspects after moving on to the trait selection and importance to identity questions. This means that any additional self-aspects that came to mind during the course of the measure could not be recorded and thus not examined.

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We do not believe, however, that our measure of self-complexity was less valid than forms of measurement used in past research on self-complexity. Two pieces of evidence exist to support our belief: our pilot testing and the data regarding the number of identities reported by participants in past studies of self-complexity. In fact, our original self-complexity measure was more holistic in that participants listed a self-aspect, chose traits for that self aspect, and rated its importance before moving on to define another self-aspect. We found, however, that this form of measurement resulted in participants reporting too few identities, or numbers not comparable to past studies of self-complexity. Using our final measure of self-complexity, participants reported similar numbers of identities to those in past studies of self-complexity (Brook, Garcia, & Fleming, 2008; Linville, 1980, 1987).

A possible limitation of our procedure is that we did not provide a cover story as to why participants were completing the same measures (mood, self-evaluation, implicit to centrality and evaluation of identities) both before and after a stress inducing task. Thus, the nature of our study in that it was measuring changes from pre task to post task may have been apparent to participants. Based on committee input, we decided that a cover story would be too convoluted and may arouse rather than quell suspicion in participants. Instead, we tried to incorporate implicit measures such as the implicit centrality to identity and evaluation of identities measures. We also used sliding visual analog scales as the response scales for the POMS as to detect subtle changes in mood.

Additional limitations include that the task block was not plausible as being a measure of ability in a number of different domains. We first tried to combat this by

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including an eclectic series of tasks, including tasks that resemble real psychological measures into the task block. Next, we tried to combat this by instead of framing the task block as being a measure of that participant's focal identity and then providing traditional failure/success feedback on the tasks, we framed the task block as being a measure of ability in a number of different domains and told participants that their failure/success feedback was a percentile relative to individuals who indicated a certain self-aspect as being a part of their self-representation. Thus, their performance feedback provided either favorable or unfavorable social comparison information relative to a relevant reference group. Past studies of self-complexity have typically examined failure/success feedback in response to an achievement related domain or measure of intelligence. That we are interested in reactivity to support receipt for domains other than academic/achievement related domains to provide a better parallel to the study by Burke and Perndorfer (in prep) necessitated the creation of a stressful task to accommodate the diversity of self-aspects generated by participants.

Similarly, one might argue that the stressful speech task and support manipulation did not successfully manipulate self-relevance. Past studies on the costs of support receipt, however, have used a similar speech task to create a self-relevant stress context (Bolger & Amarel, 2007).

Implications and Future Directions

While the results of our analyses did not replicate the results of past studies of self-complexity nor demonstrate that self-complexity is a moderator of reactivity to support receipt in self-relevant domains, we do believe that our novel measure of self-

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complexity, modified procedure for calculating self-complexity scores, and novel measures of potential cognitive mechanisms by which self-complexity may operate are contributions to the self-complexity literature. Our measure of self-complexity elicited numbers of identities reported by participants similar to those of past studies of self-complexity (e.g., Brook, Garcia, and Fleming, 2008; Linville, 1980, 1987). Our modified procedure for calculating self-complexity took into account both the number of identities in one's self-representation and their uniqueness. Similarly, the self-complexity scores calculated using this procedure were positively and significantly correlated with a more crude measure of self-complexity – number of identities, which has been used in past studies of self-complexity and been shown to produce similar patterns in results as more complex forms of measurement.

While Linville (1980, 1987) often described "spill-over," or the degree to which positive and negative feelings about one aspect of the self "spill-over" on to the evaluation of other self-aspects, thereby affecting overall affect and self-evaluation, the cognitive mechanism of this "spill-over" was never defined nor examined. We have added to the self-complexity literature by better defining this "spill-over" and providing two other cognitive mechanisms by which self-complexity may result in affective consequences. These mechanisms include the change in centrality of identities in representing the self and the change in the evaluation of identities. Additionally, we created a version of the IAT and modified scoring procedure, which allowed for an examination of these cognitive mechanisms. Future studies of self-complexity might utilize the same measures and procedures used in Study One, but restrict the stress

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context and performance feedback to achievement related domains, since past studies of self-complexity have largely examined the moderating effect of self-complexity in response to failure/success feedback for intelligence/academic achievement.

Future studies on support receipt in self-relevant domains might include measures of self-complexity as an individual difference variable. For example, administering and scoring the self-complexity measure used in this research to the sample of pregnant women in Burke and Perndorfer's study (in prep.) may have accounted for some of the variability in reactivity to support receipt in the motherhood-related domain that was observed. Future studies examining the costs of support receipt would be advised to include a measure of self-complexity along with other potential moderators of failure feedback to explain any possible variability in reactivity to support receipt that may result.

In sum, the results of these studies did not replicate the results of past studies of self-complexity nor did they corroborate our hypothesis regarding self-complexity as being a moderator of reactivity to support receipt in self-relevant domains. More specifically, participants low in self-complexity did not react more negatively to failure feedback not support receipt in a self-relevant domain than did participants high in self-complexity. We do not, however, believe that this research disproves the self-complexity affective extremity hypothesis nor discounts the possibility that self-complexity moderates reactivity to support receipt in self-relevant domains. Because no clear pattern of results emerged in either study, it is likely that other factors influencing the study were at play. This research adds to the literature on self-complexity in that we created a novel

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measure for self-complexity, a modified procedure for calculating self-complexity scores, more clearly defined the cognitive mechanisms by which self-complexity may moderate affective reactions to stressful events, and finally devised a measure to examine these purported cognitive mechanisms.

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Appendix A: Identity Organization and Selection for Studies One and Two

As previously mentioned, the data from the self-complexity measure were used to customize the part two materials for each participant. Specifically, the self-aspects listed by participants as being a part of their self-representation and the rank order of these identities was used to decide upon the framing of the task block and failure/success feedback and to create the implicit centrality to identity and evaluation of identities measure. How these identities were chosen for the framing of the task and to be included in the implicit centrality to identity and evaluation of identities measure will be explained below.

The self-complexity measure data were downloaded in the interim 1-2 weeks between participants' completion of the online self-complexity measure and laboratory session. A list of each participant's self-aspects was made in the order of importance in representing the self (i.e., in the order given by participants in the rank order) with the first identity being the identity described as being the most important in representing the overall self. This identity was the identity used for the framing of the task and failure/success feedback for the participants in the self-relevant domain condition. The first identity listed in the rank order was not chosen for the framing of the task block and performance feedback only when that identity was a description of race or gender. We did not want participants to believe that their performance on the task block was being compared to all the members of their race or gender so we avoided these identities whenever possible. Four of the self-aspects provided by each participant were chosen to create the implicit centrality to identity and evaluation of identities measure. Thus, if

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participants listed only four identities in the self-complexity measure, the minimum, then those four identities were chosen as the "Me," or self-relevant identities for the implicit measure. If participants listed more than four self-aspects during the self-complexity measure then four identities were chosen across the rank order to represent the entire span of importance in representing the overall-self. For example, identities 1, 3, 5, and 7 of the rank order may have been chosen as the four "Me," or self-relevant identities for the implicit centrality to identity and evaluation of identities measure for a participant who listed a total of eight identities in the self-complexity measure. This way, the "Me," or self-relevant identities in the implicit measure represented a similar span of importance in representing the self for participants who provided only four identities as compared to those who provided 15. Again, we tried to avoid identities describing race or gender when choosing the four "Me" identities for the implicit measure as we believed that these identities may be more deep rooted and thus have a quality of being easier to categorize as being "Me" or "Not me" during the IAT. Furthermore, we believed that choosing the "Not me" identities for identities representing race and gender would be too stereotypical and thus salient during the implicit measure (e.g., "Man and woman" or "African-American and White").

A composite list of all of the self-aspects provided by participants was compiled during the course of customizing the materials for part two of the study. The composite list was organized according to basic groups of identities (e.g., relational, employment/academics, ethnicity/patriotism, religion, hobbies, political views, social values, traits, miscellaneous). These basic identity groups were not predetermined, but

instead came naturally from the responses given by participants in the self-complexity measure. Examples of identities categorized as being relational include: sister, best friend, boyfriend, older brother, son, grandson, and nephew. Examples of identities categorized as being hobbies include: wrestler, musician, orch-dork, writer, and sorority member. The framing of the task block and failure/success feedback for participants in the not-self relevant domain condition and the four "Not me," or not self-relevant identities, for the implicit measure for all participants were chosen from this composite list. More specifically, if a participant listed a relational identity as being the first identity in their rank order but was assigned to the not self-relevant domain condition, then another identity from the relational group, but not one provided by that particular participant was chosen for the framing of the task and performance feedback. The four "Not me" identities for the implicit centrality of identity and evaluation of identities measure were chosen in a similar manner. These "Not me" identities were chosen from the same basic groups of identities as the four "Me" identities provided by participants, but were identities that other participants had listed and were not similar to the identities provided by that particular participant, but were not clear cut or stereotypical opposites. For example, for a participant with the four "Me" identities "daughter, psychology major, reader, and theater technician," the group of four "Not me" identities for the implicit measure could plausibly be "girlfriend, neuroscience major, pianist, and sorority member." These "Not me" identities are from the same basic groups of identities (relational, employment/academic, and hobbies), but were not listed by the particular participant and are not clear cut or stereotypical opposites (such as choosing "athlete" as

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the "Not me" for "reader"). In sum, for participants in the self-relevant domain condition the task block and performance feedback was framed in terms of the first identity provided in the rank order in the self-complexity measure. For participants in the not-self relevant domain condition, the framing of the task block and performance feedback was for an identity from the same basic group as the identity listed first in the rank order by that participant, but not one listed by that participant, and not a clear cut or stereotypical opposite. The four "Me" identities for the implicit measure were chosen to represent the span of importance in representing the overall self. The four "Not me" identities were chosen from the same basic identity groups as the four "Me" identities, but were again not identities listed by that particular participant and were not clear-cut or stereotypical opposites to the "Me" identities.

Appendix B: Complete Results from Study One

Change in distress. The results of the analyses indicate that there was no main effect of self-complexity ($F(1,67) = 1.26$, $p = .266$), no main effect of self-relevance ($F(1,67) = 0.03$, $p = .873$), and no main effect of performance feedback ($F(1,67) = 3.04$, $p = .086$) in predicting change in distress. The two-way interactions between self-complexity and self-relevance ($F(1,67) = 0.38$, $p = .542$), self-complexity and performance feedback ($F(1,67) = 0.00$, $p = .957$), and performance feedback and self-relevance ($F(1,67) = 0.66$, $p = .419$) were also not significant. Finally, the three-way interaction between self-complexity, self-relevance, and performance feedback was not significant ($F(1,67) = 0.33$, $p = .568$). Figure 1 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in self-evaluation. The results of the analyses indicate that there was no main effect of self-complexity ($F(1,67) = 1.28$, $p = .263$), no main effect of self-relevance ($F(1,67) = 0.76$, $p = .388$), and no main effect of performance feedback ($F(1,67) = 1.33$, $p = .253$) in predicting changes in self-evaluation. The two-way interactions between self-complexity and self-relevance ($F(1,67) = 0.14$, $p = .705$), self-complexity and performance feedback ($F(1,67) = 0.00$, $p = .980$), and performance feedback and self-relevance ($F(1,67) = 0.00$, $p = .963$) were also not significant. Finally, the three-way interaction between self-complexity, self-relevance, and performance feedback was not significant ($F (1,67) = 0.04$, $p = .836$). Figure 2 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Change in vigor. The main effects of self-complexity ($F(1,67) = 0.34$, $p = .560$), self-relevance ($F(1,67) = 0.10$, $p = .750$), and performance feedback ($F(1,67) = 0.26$, $p = .615$) were not significant in the model. The two-way interactions between self-complexity and self-relevance ($F(1,67) = 0.56$, $p = .456$) and that between self-relevance and performance feedback ($F(1,67) = 1.21$, $p = .276$) were not significant. The two-way interaction, however, between self-complexity and performance feedback ($F(1,67) = 11.24$, $p < .05$) was significant. Similarly, the three-way interaction between self-complexity, self-relevance, and performance feedback ($F(1,67) = 19.81$, $p < .05$) was significant in predicting changes in vigor across the study. Figure 3 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me1 identity in representing the overall self. The main effects of self-complexity ($F(1,67) = 0.01$, $p = .910$), self-relevance ($F(1,67) = 0.22$, $p = .641$), and performance feedback ($F(1,67) = 0.29$, $p = .595$) on change in the centrality of the Me1 identity in representing the overall self from pre to post were not significant. The two-way interactions between self-complexity and self-relevance ($F(1,67) = 0.00$, $p = .967$), self-complexity and performance feedback ($F(1,67) = 2.67$, $p = .107$), and self-relevance and performance feedback ($F(1,67) = 0.69$, $p = .408$) were not significant. Finally, the three-way interaction between self-complexity, self-relevance, and performance feedback was not predictive of the change in the centrality of the Me1 identity from pre to post ($F(1,67) = 0.23$, $p = .636$). Figure 4 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Change in the evaluation of the Me1 identity. The main effects of self-complexity (F (1,67) = 0.59, p = .445), self-relevance (F (1,67) = 0.07, p = .791) and performance feedback (F (1,67) = 3.04, p = .086) on change in the evaluation of the Me1 identity from pre to post were not significant. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.76, p = .388), self-complexity and performance feedback (F (1,67) = 0.39, p = .537), and self-relevance and performance feedback (F (1,67) = 1.40, p = .242) were not significant. Finally, the three-way interaction between self-complexity, self-relevance, and performance feedback was not predictive of the change in evaluation of the Me1 identity from pre to post (F (1,67) = 0.61, p = .437). Figure 5 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self. The change in centrality scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining changes in the centrality of these three identities in representing the self to improve our power to detect a small effect. The results of the analyses indicate that the main effects of self-complexity (F (1,67) = 0.10, p = .747), self-relevance (F (1,67) = 0.20, p = .659), and performance feedback (F (1,67) = 3.48, p =.067) were not significant in predicting changes in the centrality of these three identities in representing the self from pre to post. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.08, p = .774), self-complexity and performance feedback (F (1,67) = 0.15, p = .702), and self-relevance and performance feedback (F (1,67) = 0.12, p = .733) were not significant nor was the three-

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way interaction (F (1,67) = 2.02, p = .160). Figure 6 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the M2, Me3, and Me4 identities combined.

Similarly, the change in the evaluation scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining the changes in the evaluation of these non-focal identities. The results reveal that the main effects of self-complexity (F (1,67) = 0.13, p = .717) and self-relevance, [F(1,67) = 2.39, p = .137)] were not significant. The main effect of performance feedback was significant (F (1,67) = 5.04, p < .05). The two-way interactions between self-complexity and self-relevance (F (1,67) = 1.98, p = .164), self-complexity and performance feedback (F (1,67) = 1.10, p = .298), and self-relevance and performance feedback (F (1,67) = 0.24, p = .627) were not significant. The three-way interaction between self-complexity, self-relevance, and performance feedback (F (1,67) = 0.19, p = .663) was also not significant in predicting changes in the evaluation of identities Me2, Me3, and Me4 from pre to post. Figure 7 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Appendix C: Complete Results for Study Two

Changes in distress. The results of the analyses indicate that there was no main effect of self-complexity (F (1,67) = 0.00, p = .998), no main effect of self-relevance (F (1,67) = 1.47, p = .230), and no main effect of support receipt (F (1,67) = 0.14, p = .705) in predicting change in distress. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.88, p = .351), self-complexity and support receipt (F (1,67) = 0.03, p = .868), and support receipt and self-relevance (F (1,67) = , p = .998) were also not significant. Finally, the three-way interaction between self-complexity, self-relevance, and support receipt was not significant (F (1,67) = 0.40, p = .531). Figure 8 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Changes in self-evaluation. The results of the analyses indicate that there was no main effect of self-complexity (F (1,67) = 0.30, p = .587), no main effect of self-relevance (F (1,67) = 0.79, p = .377), and no main effect of support receipt (F (1,67) = 0.32, p = .571) in predicting changes in self-evaluation. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.06, p = .806), self-complexity and support receipt (F (1,67) = 1.24, p = .270), and support receipt and self-relevance (F (1,67) = 0.13, p = .724) were also not significant. Finally, the three-way interaction between self-complexity, self-relevance, and support receipt was not significant (F (1,67) = 0.08, p = .773). Figure 9 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

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Changes in vigor. The main effects of self-complexity (F (1,67) = 2.98, p = .089), self-relevance (F (1,67) = 0.36, p = .551), and support receipt (F (1,67) = 1.46, p = .231) were not significant in the model. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.67, p = .417), self-complexity and support receipt (F (1,67) = 0.39, p = .533), and that between self-relevance and support receipt (F (1,67) = 0.00, p = .969) nor was the three-way interaction between self-complexity, self-relevance, and support receipt (F (1,67) = 0.53, p = .468) significant in predicting changes in vigor across the study. Figure 10 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me1 identity in representing the overall self. The main effects of self-complexity (F (1,67) = 2.16, p = .147), self-relevance (F (1,67) = 3.83, p = .055), and support receipt (F (1,67) = 1.42, p = .238) on change in the centrality of the Me1 identity in representing the overall self from pre to post were not significant. The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.42, p = .521), self-complexity and support receipt (F (1,67) = 0.00, p = .965), and self-relevance and support receipt (F (1,67) = 0.33, p = .568) were not significant. Finally, the three-way interaction between self-complexity, self-relevance, and support receipt was not predictive of the change in the centrality of the Me1 identity from pre to post (F (1,67) = 0.09, p = .765). Figure 11 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the Me1 identity. The main effect of self-complexity on the change in the evaluation of the Me1 identity from pre to post was

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significant (F (1,67) = 8.30, $p < .05$). The main effects of self-relevance (F (1,67) = 1.51, $p = .223$) and support receipt (F(1,67) = 0.00, $p = .959$) on change in the evaluation of the Me1 identity from pre to post were not significant. The two-way interaction between self-complexity and self-relevance in predicting the change in the evaluation of the Me1 identity was significant (F (1,67) = 5.20, $p < .05$). The two-way interactions between self-complexity and support receipt (F (1,67) = 1.19, $p = .280$), however, and self-relevance and support receipt (F (1,67) = 0.00, $p = .977$) were not significant. Finally, the three-way interaction between self-complexity, self-relevance, and support receipt was not predictive of the change in evaluation of the Me1 identity from pre to post (F (1,67) = 0.53, $p = .470$). Figure 12 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self. The change in centrality scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining changes in the centrality of these three identities in representing the self to improve our power to detect a small effect. The results of the analyses indicate that the main effects of self-complexity (F (1,67) = 0.93, $p = .339$) and self-relevance (F (1,67) = 0.47, $p = .498$) were not significant in predicting changes in the centrality of these three identities in representing the self from pre to post. The main effect of support receipt was, however, significant in predicting changes in the centrality of the Me2, Me3, and Me4 identities from pre to post (F (1,67) = 5.59, $p <.05$). The two-way interactions between self-complexity and self-relevance (F (1,67) = 0.32, $p = .571$), self-complexity and support receipt (F (1,67) =

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0.07, p = .788), and self-relevance and support receipt (F (1,67) = 0.27, p = .606) were all not significant. The three-way interaction was also not significant (F (1,67) = 0.08, p = .776). Figure 13 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Change in the evaluation of the Me2, Me3, and Me4 identities combined.

Similarly, the change in the evaluation scores for identities Me2, Me3, and Me4 were averaged together instead of individually examining the changes in the evaluation of these non-focal identities. The results of the analyses examining the effects of self-complexity, self-relevance, and support receipt and their interactions on the change in the evaluation of identities Me2, Me3, and Me4 from pre to post reveals that the main effects of self-complexity (F (1,67) = 1.13, p = .293), self-relevance, (F (1,67) = 0.01, p = .942), and support receipt (F (1,67) = 0.52, p = .475) were not significant. The two-way interactions between self-complexity and self-relevance (F (1,67) = 1.39, p = .243), self-complexity and support receipt (F (1,67) = 0.00, p = .960), and self-relevance and support receipt (F (1,67) = 0.32, p = .575). The three-way interaction between self-complexity, self-relevance, and support receipt (F (1,67) = 4.26, p < .05) was found to be significant in predicting changes in the evaluation of identities Me2, Me3, and Me4 from pre to post. Figure 14 shows the pattern of results for individuals low (-1 SD) and high (+1 SD) on self-complexity.

Figures
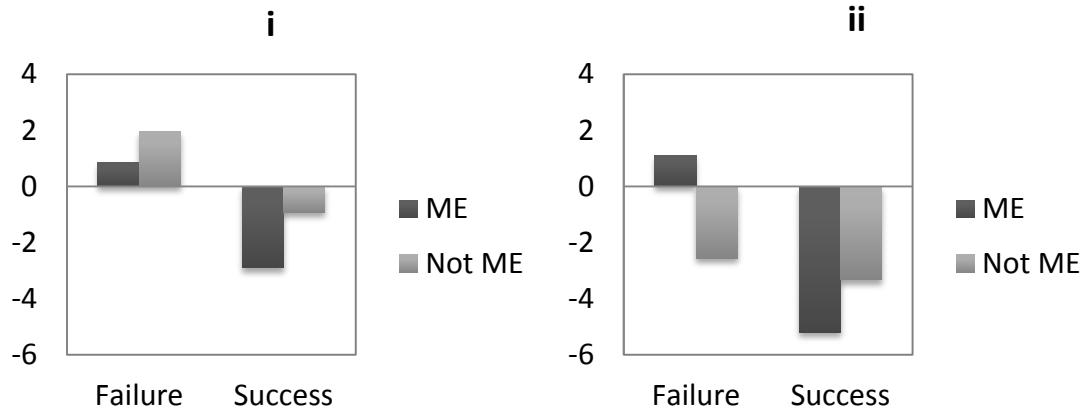
Figure 1. Change in distress as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.
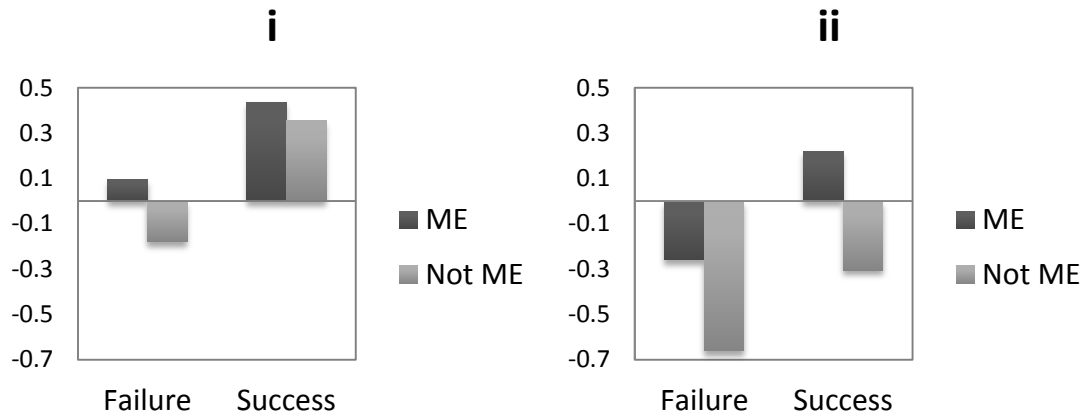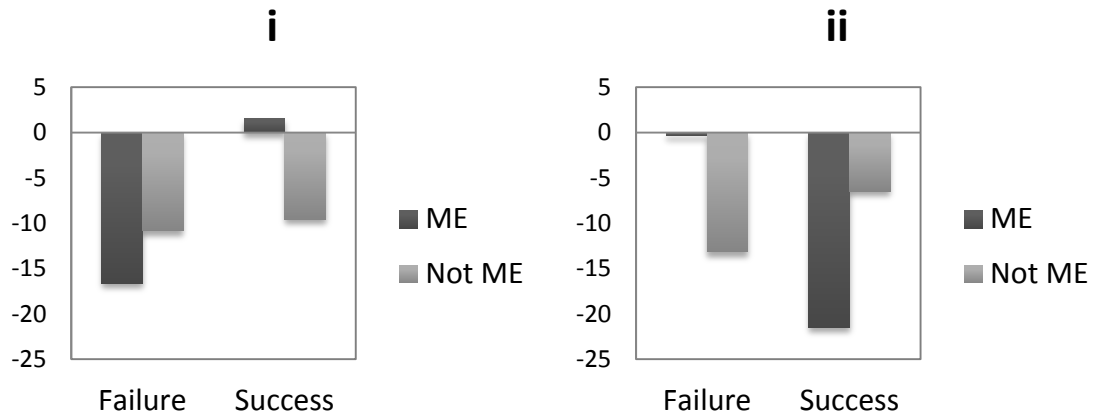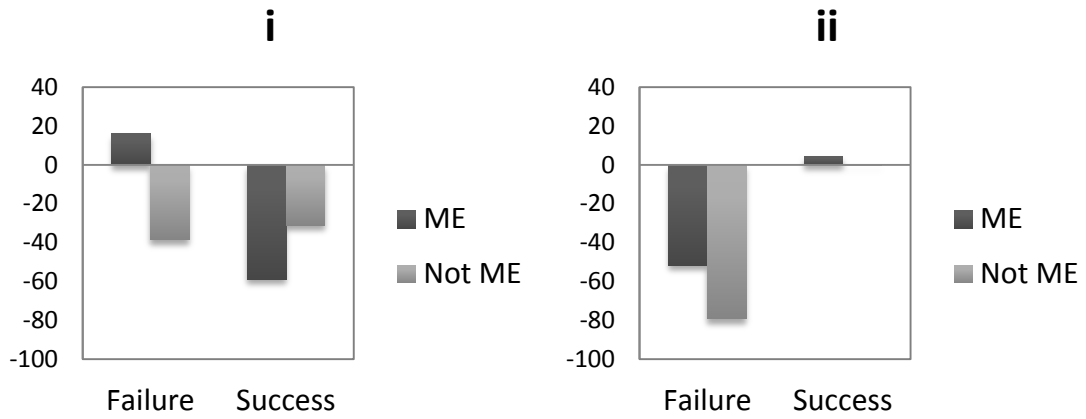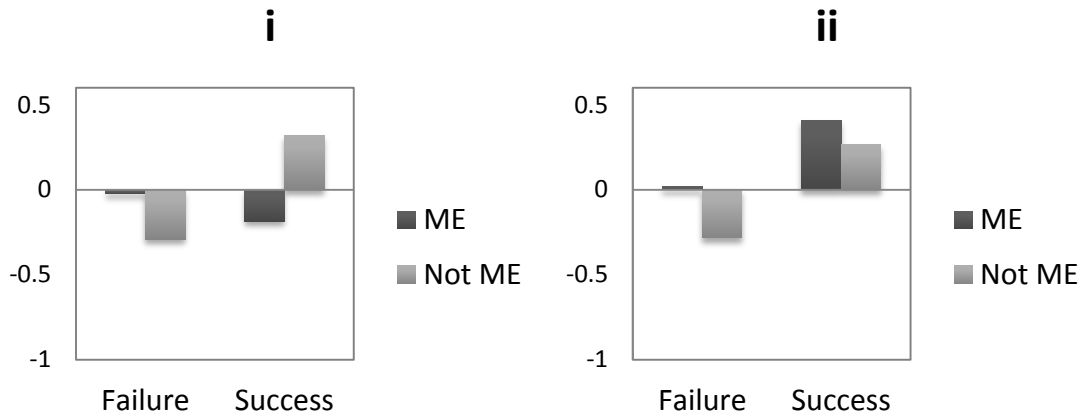
Figure 2. Change in self-esteem as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.
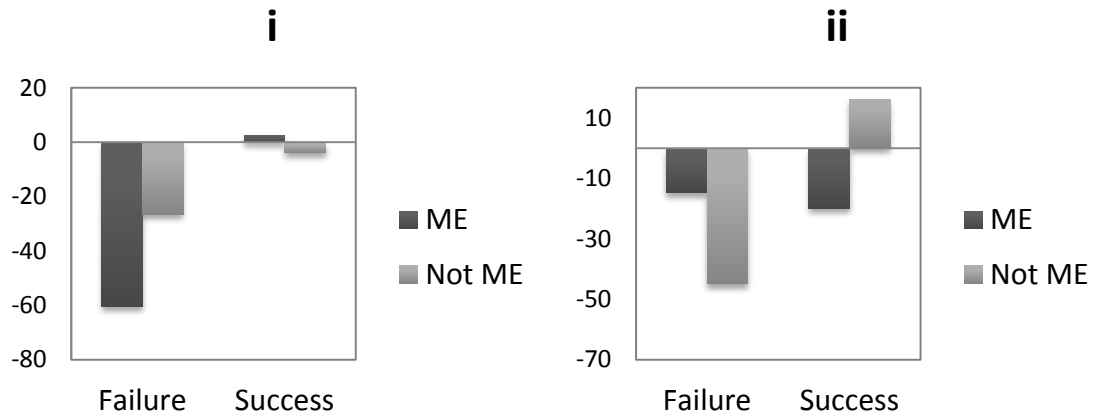
Figure 3. Change in vigor as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.

Figure 4. Change in the centrality of the Me1 identity in representing the overall self as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.
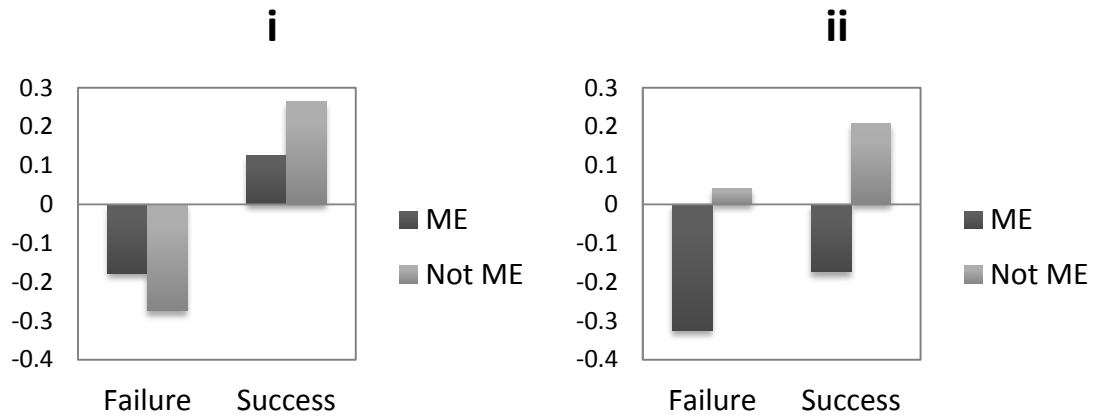
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Figure 5. Change in the evaluation of the Me1 identity as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.

Figure 6. Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.
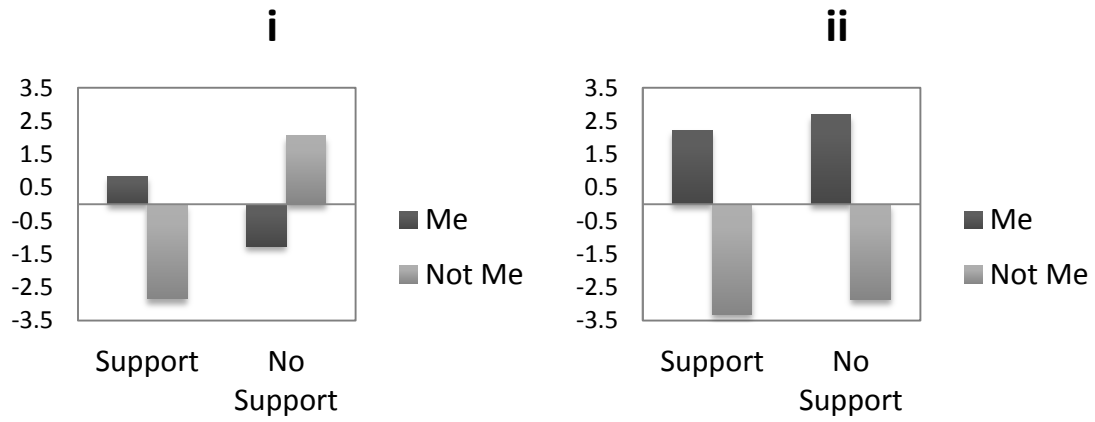
Figure 7. Change in the evaluation of the Me2, Me3, and Me4 identities combined as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study One.

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Figure 8. Change in distress as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.
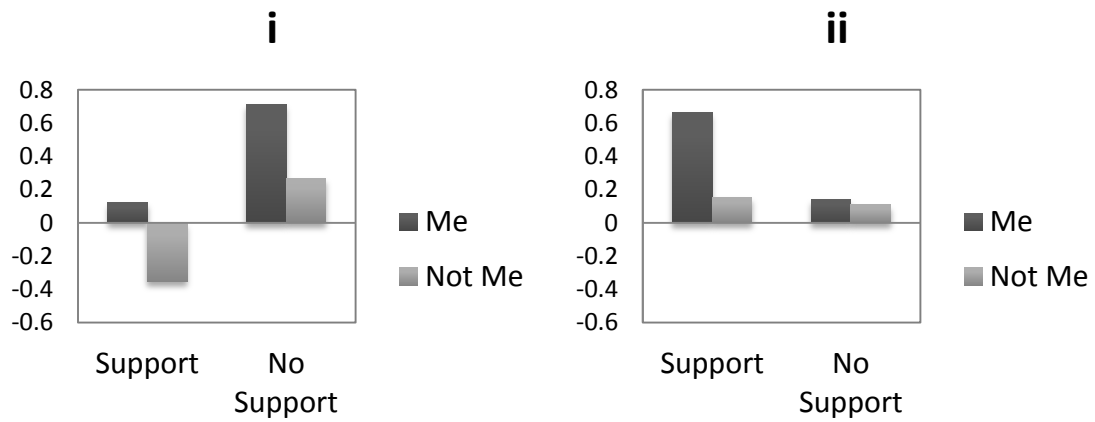
Figure 9. Change in self-esteem as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.
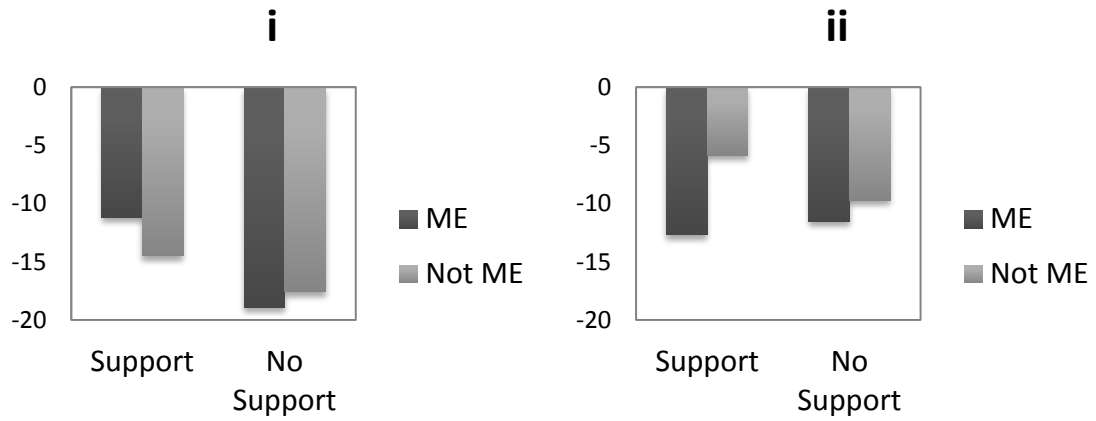
Figure 10. Change in vigor as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.

Figure 11. Change in the centrality of the Me1 identity in representing the overall self as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.
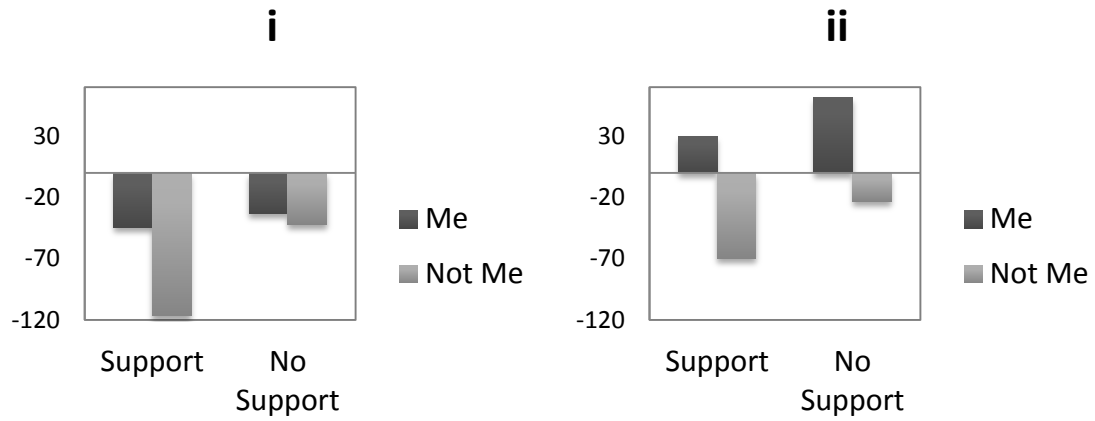
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Figure 12. Change in the evaluation of the Me1 identity as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.
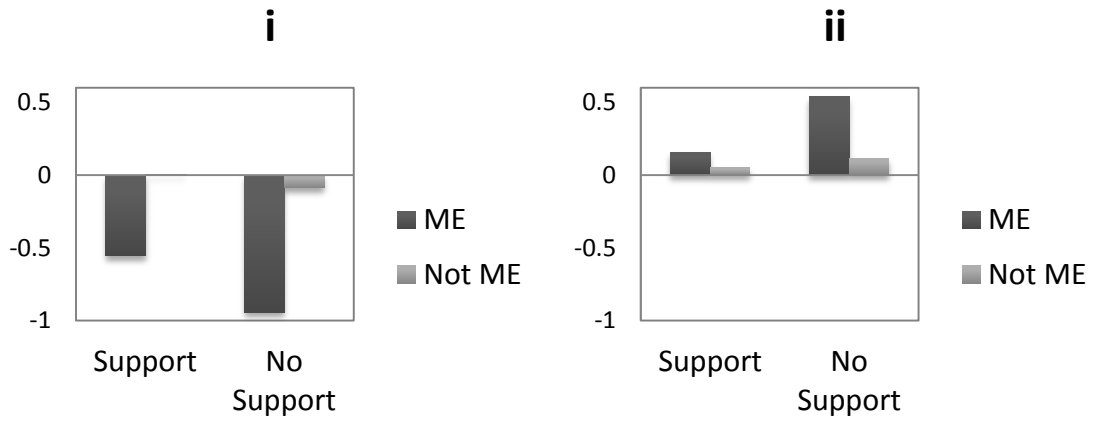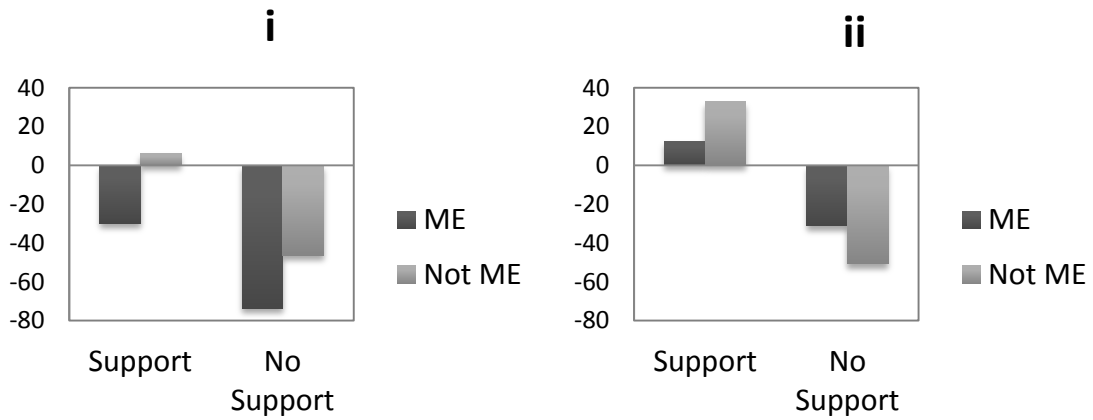
Figure 13. Change in the centrality of the Me2, Me3, and Me4 identities combined in representing the overall self as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.

Figure 14. Change in the evaluation of the Me2, Me3, and Me4 identities combined as a function of feedback (failure vs. success) and identity ("Me" vs. "Not Me") for (i) individuals low (-1 SD from the mean) and (ii) high (+1 SD from the mean) on self-complexity in Study Two.
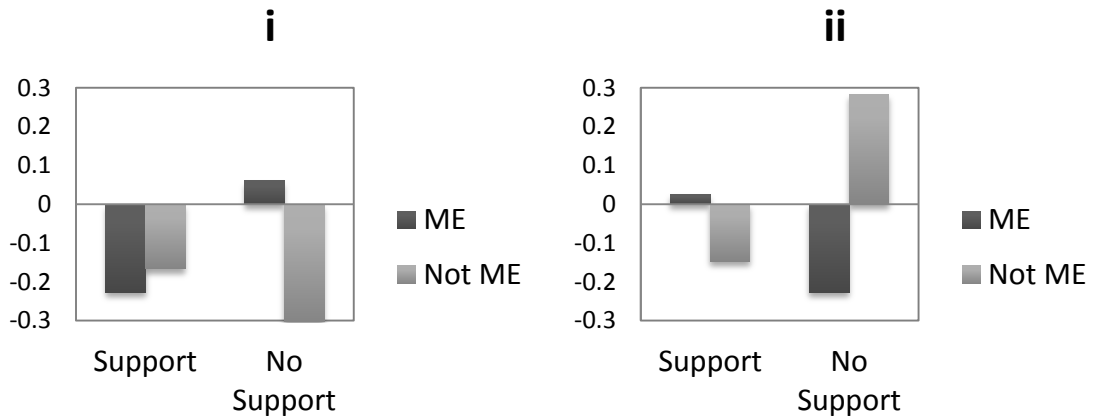
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Education

2012 – Present	Enrolled M.S. Program, Psychology, Lehigh University; Bethlehem, PA
	Expected Graduation: January, 2014
	Concentration: Social Psychology
	Advisor: Christopher T. Burke, Ph.D.
	Current GPA: 3.94
2008 - 2012	B.S. Psychology, Lehigh University; Bethlehem, PA
	January, 2012
	Concentration: Clinical Psychology
	GPA: 3.79
	Minor: Spanish

Current Research

I am deeply interested in better understanding the influence of social support interactions on both daily and important long term outcomes such as physiological and mental health. My research investigates why support receipt can be associated with costs whereas perceived support is almost unequivocally associated with positive outcomes. Specifically, I am interested in the influence that daily reactivity to support receipt has on both physiological and mental health. My current research focuses on the influence support receipt during pregnancy has on daily mood outcomes and how these effects are related to risk for negative outcomes like postpartum depression. I am also interested in examining why some individuals react more negatively to receiving help than do others. Specifically, my research examines self-complexity as a within-person factor that may explain some of this variability.

Papers and Presentations

Burke, C.T. & Perndorfer, C. (In prep). *Social Support Receipt during Pregnancy and Risk for Postpartum Depression.*

Perndorfer, C. & Burke, C.T. (2013, May). *Reactivity to motherhood-related social support receipt during pregnancy and risk for PPD.* Poster presented at the 25th annual meeting of the Association for Psychological Science, Washington, D.C.

Perndorfer, C. & Burke, C.T. (2013, March). *Reactivity to support receipt during pregnancy and postpartum.* Poster presented at the 2013 Exhibition of Student Research and Scholarship, Lehigh University.

Perndorfer, C. & Burke, C.T. (2013, January). *Reactivity to support receipt during pregnancy and postpartum.* Poster presented at the 14th annual meeting of the Society for Personality and Social Psychology, New Orleans, LA.

Burke, C.T., Perndorfer, C., & Goren, J. (2013, January). *Social support receipt, loving acts, and risk for postpartum depression.* Symposium *What others say, do, and think: how partner and family support, health values and individual differences influence major medical outcomes throughout life* at the 14th annual meeting of the Society for Personality and Social Psychology, New Orleans, LA.

Perndorfer, C. (October, 2012) *Reactivity to social support receipt and risk for postpartum depression.* Talk presented at Psychology Department meeting, Lehigh University.

Research Experience

2012   Master's Thesis
       Department of Psychology, Lehigh University
       Self-complexity: a potential moderator of reactivity to social support receipt
       Description: Investigate self-complexity as a within-person factor that may explain why some individuals react more negatively to receiving help than do others
       Design: Pilot and primary study with both studies being two-part studies consisting of an online survey and in lab session
       Responsibilities: literature review and proposal, IRB approval, participant recruitment, communication and credit, creation of study materials, train and

oversee RAs in study procedure, running of over 200 participants, data collection and analysis, and written formal report.

2012   PA Cure Award
        (P.I.: Christopher T. Burke) Department of Psychology, Lehigh University
        Examining the interactions of cortisol, estradiol, and psychosocial stress as predictors of postpartum depressive symptoms
        Description: Grant awarded to my adviser, Christopher T. Burke, after which I took on the project
        Design: Longitudinal study utilizing a daily diary design that follows pregnant women from the sixth month of pregnancy to 5 weeks postpartum
        Responsibilities: recruitment of 40+ pregnant women from the community, participant enrollment, communication, and compensation, training of saliva collection procedures with participants, pick-up, handling, and shipment of saliva samples

2012   First-Year Research Project
        Department of Psychology, Lehigh University
        Reactivity to social support receipt and risk for postpartum depression.
        Description: Examined reactivity to support receipt in personally relevant (motherhood-related) as compared to less salient domains and how this reactivity predicts long term outcomes such as risk for postpartum depression
        Design: Longitudinal study utilizing a daily diary design that followed pregnant women from the sixth month of pregnancy to six weeks postpartum
        Responsibilities: literature review and proposal, IRB approval, recruitment of 30+ pregnant women from the community, participant communication and compensation, coding of data, data analysis, and written formal report.

2011   Senior Honors Thesis
        Department of Psychology, Lehigh University
        Influence of Intensive Mothering Beliefs on Role importance, Role satisfaction, and Peripartum Depression.

2010-2011   Center for Promoting Research to Practice, College of Education, Lehigh University; Bethlehem, PA – Research assistant to George J. DuPaul, Ph.D.

Teaching Experience

2012- 2013   Graduate Teaching Assistant – Statistical Analysis of Behavioral Data, Personality Psychology, Adulthood and Aging, Lehigh University; Bethlehem, PA

Created lesson plans and taught weekly Statistics lab for SPSS and Excel; planned and taught a lecture for both Statistics and Personality Psychology; met weekly with students during office hours; graded weekly homework assignments and exams

Summer 2013 & 2013 Course Assistant – Introduction to Psychology, Lehigh University; Bethlehem, PA

2012 Teacher Development Series – Attend biweekly seminar on cultivating teaching skills

2011 Apprentice Teaching – Abnormal Psychology, Lehigh University; Bethlehem, PA

Clinical Experience

2011 – Present   Technician – David S. Glosser Neuropsychology & Behavioral Medicine; Allentown, PA

Trained to administer and score wide range of neuropsychological assessments including but not limited to the: Wechsler Adult Intelligence Scale IV, Cross Cultural Cognitive Examination, Wechsler Memory Scale III & IV, Wide Range Achievement Test IV, Biber Figure Learning Test, California Verbal Learning Test, Rey-Osterrieth Complex Figure Test, Receptive One-Word Picture Vocabulary Test, Instrumental Activities of Daily Living Scale, Parkinson's Disease Quality of Life Scale

Honors, Accomplishments, and Professional Memberships

2013 Association for Psychological Science

2012 APA Division 38 Health Psychology

2012 Society for Personality and Social Psychology

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2012   Presidential Scholarship, Lehigh University; Bethlehem, PA
        Recognizes outstanding academic achievement
        5th year of study provided free of tuition

2012 Level II Certificate for Lehigh University Teacher Development Program

2011 Inducted – Phi Beta Kappa

2010 Inducted – Psi Chi

Dean's List, Lehigh University; Bethlehem, PA

University Service	
2012 – 2013	Psychology Department Brown Bag Coordinator
	Organize weekly speaker series for the department
2011 – 2012	Psychology Club President
2009 – 2010	Psychology Club Vice President

Skills

- Proficient in Microsoft Office
- R, SAS, and SPSS Statistical Software
- SurveyMonkey and Qualtrics
- German fluency
- Spanish proficiency