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Adaptive decision-making as a mediator between self-complexity and stress

Jeremy L. Foust
Kent State University, jeremy.foust33@gmail.com

Stephanie B. Richman
Baldwin Wallace University, srichman@bw.edu

Abstract

Empirical studies have indicated a relationship between self-complexity and stress, such that greater self-complexity is associated with reduced stress. In addition, previous research has suggested that greater self-complexity allows for more advantageous decisions. Finally, previous studies have demonstrated a bidirectional relationship between adaptive decision-making and stress, such that increased stress is associated with a decreased ability to make adaptive decisions, which, in turn, increases future stress. However, no research to date has examined the mechanism behind these relationships. We hypothesized that greater self-complexity would lead to less stress and this relationship would be mediated by increased adaptive decision-making. Fifty-six college students at a private Midwestern university took part in the study. We manipulated self-complexity by asking participants to assign traits to their future self according to three (low complexity) or seven (high complexity) different self-aspects, consistent with a previous manipulation of self-complexity by Setterlund (1994). Next, participants underwent a task—used previously by Levin et al. (2007)—to measure their adaptive decision-making in which they selected either one cup for a guaranteed amount of money, or a set of cups, which would statistically yield a greater or lesser sum of money. Finally, participants took a college student stress scale. The main hypothesis was not supported, as the present study did not find that adaptive decision-making mediated the relationship between self-complexity and stress. However, self-complexity did significantly predict adaptive decision-making for the “risky loss” trials. No other paths yielded significant relationships.

Keywords: Self-complexity; Adaptive decision-making; Stress; Self-aspects

Adaptive decision-making as a mediator between self-complexity and stress

Every person experiences stress in some capacity. Stress affects how individuals are able to assess consequences, and therefore also impacts their ability to make adaptive decisions (Wemm & Wulfert, 2017). Research by Linville (1987) suggests that self-complexity can act as a buffer against stress and depression. Linville (1985) defined self-complexity as a representation of the amount of unique self-aspects—cognitive structures that individuals have about themselves for the roles they play and their interpersonal relationships—that one has, as well as the degree of differentiation between these different aspects in the framework of one's life. Just as self-complexity relates to stress, self-complexity has been shown to influence one's adaptive decision-making, such that those who are higher in self-complexity tend to be better equipped to adapt their decision-making strategy to be more advantageous (Hannah et al., 2013). While one's self-complexity is often measured as an individual difference variable, some prior studies have manipulated self-complexity (Margolin & Niedenthal, 2000; Setterlund, 1994), with one study suggesting manipulating self-complexity is associated with decision-making (Halberstadt et al., 1996). The current research examines the potential mediating role of adaptive decision-making between self-complexity and stress.

Self-Complexity and Stress

The amount of self-complexity that one has affects the amount of stress that they feel. The self-complexity buffering hypothesis would suggest that for those higher in self-complexity, a stressor would only affect the self-aspects triggered by the life event associated with that particular stressor (Linville, 1987). For instance, suppose someone represents themselves in terms of eight self-aspects: their student-self, athlete-self, social-self, child-self, brother-self, research-self, advisee-self, and coach-self. Furthermore, each aspect that this person has is highly

independent of each other aspect. Thus, there is very little, if any, overlap between the different self-aspects. This person would have a high level of self-complexity since they represent themself in terms of a higher number of self-aspects and maintain a greater distinction between these diverse aspects (Linville, 1987). According to the self-complexity buffering hypothesis, if this person with high self-complexity is feeling stressed in one aspect of their life then there may be little, if any, stress spillover to other aspects of their life due to their higher number of self-aspects and greater distinction between them (Linville, 1987).

Likewise, suppose another person represents themselves in terms of just two self-aspects: their student-self and their athlete-self. Moreover, these two aspects are highly related to one another, such that there is a high degree of overlap between the two different self-aspects. This person would have a low level of self-complexity since they represent themself in terms of a lower number of self-aspects and do not maintain a great degree of overlap between these aspects (Linville, 1987). According to the self-complexity buffering hypothesis, if one aspect of this person's self is experiencing stress, there may be a great deal of spillover to the other aspect due to their smaller number of self-aspects and smaller distinction between them (Linville, 1987).

Thus, low self-complexity can lead to an "affective spillover"—a situation in which thoughts and feelings, including stress, will carry over from one self-aspect to another—whereas high self-complexity can act to shield an individual from this phenomenon (Linville, 1987). Therefore, self-complexity serves as a buffer for stress.

More recently, research has highlighted the role that self-complexity plays in emotion-regulation. Perry and colleagues (2019) found that lower self-complexity corresponds with less effective emotion-regulation outcomes for individuals who did not have a date on Valentine's

Day. Thus, self-complexity serves as a buffer for those who experience a stressful situation in a dating context. This is consistent with the self-complexity buffering hypothesis in that a broader range of social roles may lessen a negative event's impact. Mavor et al. (2014) proposed a model which highlighted the interaction between self-complexity and group identity in buffering stress and promoting well-being in medical students. Specifically, having a diverse set of interests, which would correspond to higher self-complexity, buffers against stress. Yet, medical students are also pressured to adhere to the norms and identify strongly with being a medical practitioner, which may undermine a global sense of well-being. This model proposes that self-complexity and group identity are competing forces, and the biggest benefit to medical students would be to strike the right balance, such that self-complexity can reduce the stressful influence of strongly identifying as a medical practitioner in medical school.

Furthermore, Rothermund and Meiniger (2004) found a significant interaction between the number of negative events that one experiences and the number of self-aspects in predicting changes in depression. The interaction suggested that for a small number of self-aspects, the relationship between negative events and depression was positive, whereas when one possessed a greater number of self-aspects, the relationship between negative events and depression was greatly reduced and no longer statistically significant. This again demonstrates the importance of a greater number of self-aspects in weakening the relationship between negative life events and depression.

Finally, Cohen et al. (2014) assessed self-complexity and depressive symptoms in a longitudinal study, where depressive symptoms and negative events were assessed for two years in three month intervals after a baseline measure of self-complexity, depressive symptoms, and negative events were recorded. The researchers found that a higher (as opposed to lower) number

of self-aspects was associated with slightly lower levels of depressive symptoms when faced with high stressors. Thus, self-complexity (specifically the number of self-aspects that one possesses) is able to buffer people from feeling depressed under stressful situations over a period of time.

These findings are all consistent with the self-complexity buffering hypothesis, specifically with regard to emotion regulation and depressive symptoms. While self-complexity's buffering features have been examined correlationally, no study has yet to manipulate self-complexity and test its effects on stress. The present study does just that, using a paradigm established by Setterlund (1994).

Adaptive Decision-Making and Stress

Individuals make a variety of decisions, varying in magnitude, on a daily basis. These range from whether to wear a blue shirt or a red shirt, to where to buy the house to raise a family in. In each scenario, individuals will select an option from a variety of alternatives using a decision-making strategy (Payne et al., 1988). Altering one's decision strategy to suit the situation at hand in order to make the best decision possible is the basis of adaptive decision-making. Some examples of decision-making strategies, ranging from minimal effort to very exhaustive, are described by Payne and colleagues (1988). For instance, the Weighted Additive (WADD) approach is an exhaustive approach in which the decision-maker considers each alternative on each relevant attribute and then multiplies that value by the probability of that alternative occurring. The Random (RAN) approach requires the minimum effort possible, as an alternative is chosen at random. Other strategies fall somewhere between these two strategies in terms of effort required. For instance, the Satisficing (SAT) approach (Simon, 1955) looks at all the alternatives in the order in which they appear in the set and compares each attribute to a

predetermined cutoff value. If any attribute for the given alternative is below the cutoff, the alternative is rejected. The first alternative that passes all of the cutoffs is selected, even if all of the alternatives have not been assessed. One's ability to choose a strategy, such as the ones discussed above, that is efficient in terms of accuracy and effort based on context is referred to as adaptive decision-making (Payne et al., 1988).

It may seem logical to assume that an exhaustive strategy would yield better results as compared to a strategy that does not take every factor into account, such as the Random or Satisficing approach. However, in environments in which there are time constraints, a heuristic—a mental shortcut taken by an individual to arrive at a sufficient decision—may be better than an exhaustive strategy because the decision process using a heuristic approach may be "further along" when time runs out (Payne et al., 1988). Therefore, there are circumstances in which a less exhaustive strategy would yield better results, and thus be a more adaptive decision. For instance, one decision strategy—the lexicographic rule—achieves 90% accuracy relative to the most exhaustive strategy, with only about 40% of the effort (Payne et al, 1988). In situations in which time is limited, reducing effort by 60% is more advantageous; however, in situations in which time and resources are not a priority, it would be advantageous to achieve 100% accuracy and employ the most exhaustive strategy. Thus, different situations may require the use of different decision strategies, and it would be important for one to be more adaptive in their decision-making in order to make the best possible decision given the context.

Time is one resource that may be limited, and a restriction of time may require the use of alternative decision-making strategies. When time constraints are placed upon an individual, stress may manifest (Preston et al., 2007). Furthermore, the relationship between stress and adaptive decision-making is bidirectional, meaning that decisions made under time constraints

not only lead to stress, but the stress then leads to slower recognition of the most optimal strategy. The relationship between stress and adaptive decision-making then creates a cycle of increased stress and poor decision selection (Preston et al., 2007). Under conditions of stress, it would therefore be even more important to choose the right decision framework in order to minimize one's overall stress. In this way, better adaptive decision-making can act to decrease stress, consistent with the hypothesis of the present study.

Wemm and Wulfert (2017) conducted a study to further investigate the relationship between stress and adaptive decision-making. Participants wore a heart rate monitor to measure their heart rate at different intervals throughout a series of tasks. For the stress condition, participants took an adapted version of the Trier Social Stress Test (Kirschbaum et al., 1993). As part of this task, participants were given three minutes to prepare a five-minute speech for a mock job interview, in which they had to convince two judges that they were the best person for the job. After this, participants provided subjective ratings of their stress. In addition, the researchers recorded the participants' heart rates. After, participants attempted a challenging mental arithmetic task. Then, subjective stress and heart rates were measured again. For the control condition, participants read an informative article while wearing the heart rate monitor for the same amount of time as the experimental group and had measurements of their heart rate taken at the same time as well. Then, both groups were instructed to complete the Iowa Gambling Task (Bechara et al., 1994) as a measure of their adaptive decision-making. For the Iowa Gambling Task, participants are presented with four decks of cards that either monetarily reward or punish them and are instructed to choose a deck on each trial in order to win as much money as possible. Some decks are more advantageous than others, but the participant is not told that ahead of time. Wemm and Wulfert (2017) found that participants in the stress condition with

higher physiological arousal (i.e. increased heart rate) demonstrated a lesser ability to make adaptive decisions compared to control participants. Consequently, adaptive decision-making has a negative relationship with stress, with higher levels of stress resulting in an inability to adequately assess all of the consequences of a decision (Wemm & Wulfert, 2017).

Previous research has demonstrated a bidirectional relationship between adaptive decision-making and stress (Preston et al., 2007). Adaptive decision-making can lead to feelings of stress, especially in situations in which time constraints are present, showing how adaptive decision-making can cause stress. In turn, this stress makes it more difficult to quickly identify the optimal decision-making strategy, showing how stress can cause poorer decision-making. This, in turn, compounds one's stress, and leads to a vicious cycle (Preston et al., 2007). When assessing a potential mediating role of adaptive decision-making between self-complexity and stress, it is important to understand the relationship between adaptive decision-making and stress (e.g. Wemm & Wulfert, 2017).

Self-Complexity and Adaptive Decision-Making

Previous research has also demonstrated a relationship between self-complexity and adaptive decision-making in leaders. Leaders are tasked with making important decisions in environments that are always changing and effective leaders demonstrate an ability to adapt their decision-making to respond effectively to the situation (Denison et al., 1995). Hannah and colleagues (2013) investigated the role of "leader self-complexity" in adaptive decision-making. Leader self-complexity is defined as the ability of a leader to manage their internal processes (i.e. identity) and their interactions in dynamic social environments. The participants in the study all had military leadership experience and were recruited from an Army base in the Eastern United States. In order to measure leader adaptability, the participants were put though a four-part

tactical military scenario and given free response questions to answer in order to assess their understanding of the situation and how they would respond to it. In order to measure leader self-complexity, the researchers had participants imagine themselves leading a unit in combat and wrote down the various roles that they saw themselves in. Hannah and colleagues (2013) found that leaders higher in self-complexity demonstrated greater decisiveness in tactical scenarios and greater adaptive thinking when responding to these evolving scenarios. Leaders are often very proficient when it comes to adaptive decision-making, and this may be a byproduct of their higher levels of self-complexity and the different roles they need to have, demonstrating the role that self-complexity may play in making adaptive decisions.

The Present Study

Previous research has demonstrated a significant relationship between self-complexity and adaptive decision-making, such that those who are higher in self-complexity tend to be better equipped to adapt their decision-making strategy to be more advantageous (Hannah et al., 2013). Evidence has also highlighted the relationship between adaptive decision-making and stress, such that those who have higher levels of stress may be unable to assess all of the consequences of a decision, and thus make less adaptive decisions (Wemm & Wulfert, 2017). Finally, the relationship between self-complexity and stress has been demonstrated, such that higher levels of self-complexity act as a buffer against the negative effects of stress (Linville, 1987). The present study assesses each of these relationships, as well as tests the potential mediating role of adaptive decision-making between self-complexity and stress (See Figure 1).

Method

Participants

There were 56 total participants from a private liberal arts university in the Midwest. With regard to gender, 57.9% of participants were male, 40.4% were female, and 1.8% did not answer. With regard to race/ethnicity, 84.2% were Caucasian, 5.3% were African American, 1.8% were Biracial, 5.3% were Latino(a)/Hispanic/Non-white, and 3.5% did not answer. The average age was 20.17 with a standard deviation of 5.58. However, due to one outlier who was 60, the median age of 19.0 is more representative of the sample. With regard to year in school, 49.1% were freshmen, 10.5% were sophomores, 15.8% were juniors, 19.3% were seniors, and 5.3% did not answer. As for organization involvement, 3.5% did not participate in any organizations, 38.6% participated in one organization, 17.5% participated in two organizations, 22.8% participated in three organizations, 7.0% participated in four organizations, 3.5% participated in five organizations, 1.8% participated in six organizations, and 5.3% did not answer. Participants were recruited via email and social media. Participants were entered to potentially win one of two $25 gift cards to either Chipotle or Starbucks.

Measures

Self-Complexity

The manipulation used in the present study was taken directly from Setterlund (1994) in which self-complexity was successfully manipulated. This manipulation was chosen since it was originally conducted with a university sample, could be carried out using an online survey tool, and was successfully carried out by a previous researcher. For the task, one group was tasked with sorting a list of 39 traits into three pre-defined self-aspects (the “low complexity group”), while the other was tasked with sorting the same list of traits into seven self-aspects (the “high complexity group”). Those in the low complexity group saw the three self-aspects of “as a parent,” “in your job/career,” and “with your significant other.” Those in the high complexity

group saw the same three self-aspects as the low complexity group, but also saw four additional self-aspects: “future education,” “on your own,” “physically,” “as a volunteer or activist.” The goal was to sort the traits in a manner consistent with your “future self.” Participants could assign as many or as few traits to any particular self-aspect. In addition, traits could be used as many or as few times as necessary to complete the task to the participant’s best ability. For instance, the trait “relaxed” could be applied to just one self-aspect, multiple self-aspects, or none of the self-aspects (See Figure 2).

There were only three small deviations in the current measure from the one used by Setterlund (1994). First, the present study was conducted online, rather than using paper and pencil. Second, the present study used the future self-aspect of “as a parent” instead of “as a mother” in order to ensure a more realistic manipulation for male participants. Third, participants were told by Setterlund that they had 15 minutes to complete the task, whereas there were no temporal guidelines provided in the present study. In the present study, 29 participants were part of the “low complexity group” and 27 participants were part of the “high complexity group.”

Adaptive Decision-Making

The “cups task” was used to measure adaptive decision-making (Levin et al., 2007). This paradigm contains several trials, with the goal of making as much money as possible. Each participant underwent a series of “gain” trials, in which they picked between one cup, where they had the option to gain a guaranteed sum, or a group of other cups, where they could either gain a greater sum or nothing (see Figure 3). In addition to the “gain” trials, the process was repeated with “loss” trials, in which participants picked between one cup, where they had the option to lose a guaranteed sum, or a group of other cups, where they could either lose a greater sum or nothing. Adaptive decision-making was measured in three different ways (Levin et al., 2007).

The first way was taking the sum of the number of risky choices on "gain" trials and risky choices on the "loss" trials, then dividing by the difference of the two scores. This gave an overall statistic that was used in measuring overall adaptive decision-making, referred to as "Risky Overall." The second way was measured by calculating the difference of total number of risky choices on risk advantageous trials and total number of risky choices on the risk disadvantageous trials. This was only done for the "gain" trials and referred to as "Risky Gain" in the present study. The third way of measuring adaptive decision-making was doing this same process for the "loss" trials and was referred to as "Risky Loss."

Stress

The College Student Stress Scale (Feldt, 2008) is an 11-item five-point Likert scale ranging from "Never" to "Very Often" that was used to assess the stress of the participants. An example item is, "Felt anxious or distressed about academic matters." The measure demonstrated good reliability, $\alpha = .85$.

Procedure

Participants began by completing the informed consent form. Subsequently, participants were randomly assigned to one of two groups in order to complete the self-complexity manipulation (Setterlund, 1994). Following that, participants completed the adaptive decision-making cups task (Levin et al., 2007). Finally, participants took the College Student Stress Scale (Feldt, 2008) and completed a series of demographic questions.

Results

Using the PROCESS macro (Hayes, 2017), a bootstrap mediation (10,000 resamples) did not find a significant indirect effect of self-complexity on stress through adaptive decision-making when using the Risky Overall adaptive decision-making statistic, 95% CI: [-.08, .13].

Furthermore, each of the three paths was analyzed. The effect of self-complexity on adaptive decision-making was not statistically significant, $t(55) = 1.56$, $p = .12$. The effect of adaptive decision-making on stress was not statistically significant, $t(55) = -.05$, $p = .96$. The effect of self-complexity on stress was not statistically significant, $t(55) = -.54$, $p = .59$.

Furthermore, the same bootstrap mediation (10,000 resamples) was run again using the PROCESS macro (Hayes, 2017) using the Risky Gain statistic. There was not a significant indirect effect of self-complexity on stress through adaptive decision-making, 95% CI: [-.06, .12]. Furthermore, each of the three paths was analyzed. The effect of self-complexity on adaptive decision-making was not statistically significant $t(55) = .38$, $p = .70$. The effect of adaptive decision-making on stress was not statistically significant $t(55) = 1.35$, $p = .18$. The effect of self-complexity on stress was not statistically significant, $t(55) = -.62$, $p = .54$.

Finally, the same bootstrap mediation (10,000 resamples) was run using the PROCESS macro (Hayes, 2017) using the Risky Loss statistic. There was not a significant indirect effect of self-complexity on stress through adaptive decision-making, 95% CI: [-.08, .17]. Furthermore, each of the three paths was analyzed. The effect of adaptive decision-making on stress was not statistically significant, $t(55) = .61$, $p = .54$. The effect of self-complexity on stress was not statistically significant $t(55) = -.69$, $p = .49$. However, there was a significant positive effect of self-complexity on adaptive decision-making, $t(55) = 2.05$, $p = .045$.

Discussion

Previous literature found a positive relationship between self-complexity and adaptive decision-making, such that those who have a higher level of self-complexity may be better able to adapt their decision-making strategy, and thus make more advantageous decisions (Hannah et al., 2013). Previous research also found a negative relationship between stress and adaptive

decision-making, such that when individuals are under stress, they are less able to assess consequences, and thus are not as proficient at making adaptive decisions (e.g. Wemm & Wulfert, 2017). Finally, previous literature found a negative relationship between self-complexity and stress, as stress and depression could be buffered by high levels of self-complexity (e.g. Linville, 1987). However, despite previous research demonstrating these relationships, the only significant relationship found within the sample in the present study was between self-complexity and adaptive decision-making for only the "risky loss" trials. Overall, the hypothesis that adaptive decision-making mediates the relationship between self-complexity and stress was not supported.

There are several possible explanations for this study failing to replicate previous results. One such explanation is about the different ways in which self-complexity can be conceptualized. Linville (1985) noted two different ways in which individuals can conceptualize the relatedness of their self-aspects: actual and cognitive. On the one hand, actual events in the real world may be responsible for the relationship between two different self-aspects. For example, say an individual has two very strong self-aspects: their profession and their relationship with their spouse. If their spouse is at least partially dependent on their income, then a professional failure may adversely affect the relationship with their spouse.

On the other hand, there may be a "cognitive correlation" between different aspects. That is, there is a perception that they are related. For instance, suppose an individual believes that their ability to understand their professors in the classroom as part of their student-self is contingent upon their ability to carry out instructions given by a coach as part of their athlete-self. Then, any failure in carrying out instructions given by a coach may adversely affect their ability to comprehend lecture material from a professor. Unlike actual correlations between self-

aspects, cognitive correlations are only the result of perceived relationships between aspects. Linville (1985) hypothesized that both the "actual correlation" and the "cognitive correlation" are factors in the mental differentiation of self-aspects.

In the present study's manipulation of self-complexity, a cognitive correlation between self-aspects may have been activated rather than an actual correlation. A participant would not have been able to connect two self-aspects through real world events (i.e., an actual correlation), since the future self-aspects are theoretical and not tied to actual events occurring in day-to-day life. Instead, a participant would need to think about how these different self-aspects would relate to one another in the future (i.e., a cognitive correlation). Linville (1985) hypothesized that both cognitive and actual correlations between self-aspects are factors in mental differentiation; however, previous research may have measured or manipulated actual correlations between self-aspects, rather than cognitive correlations between self-aspects. For instance, Rothermund and Meiniger (2004) measured self-complexity by having participants sort attributes to describe different self-aspects. Of note, participants in this study identified attributes of current self-aspects. By describing current self-aspects, participants could draw on actual correlations between self-aspects. This is different from the present study, in which participants identified attributes of future self-aspects.

This potential discrepancy between cognitive and actual correlations could explain a difference in findings. Future research should look to further investigate the relationship between actual and cognitive correlations of self-aspects. In addition, future research could assess the strength of actual and cognitive correlations. If one type of correlation between self-aspects is consistently stronger than the other type, then that may present a platform to measure and/or manipulate self-complexity in the future. Finally, perhaps one's current self-aspects are more

important than one's future self-aspects. Future research employing self-complexity manipulations may assess the difference between current self-aspect manipulation and future self-aspect manipulation.

With regard to stress, the survey given in our study asked the participants how often each event occurred during the course of the current semester, rather than their stress in the moment. Using a survey that had participants self-report their current stress may have yielded different results than those in the present study. Furthermore, the previous studies that have investigated the relationship between self-complexity and stress (Perry et al., 2019) and adaptive decision-making and stress (Wemm & Wulfert, 2017) have used measures of acute stress, rather than ongoing stress. The stress scale used in the present study was a measure of ongoing stress over the course of a semester, rather than a feeling of acute stress. Perhaps a reason for the incongruent findings compared to previous research is due to differences in acute vs. ongoing stress. In other words, self-complexity and adaptive decision-making may be related to acute stress, but not ongoing stress.

Finally, with regard to adaptive decision-making, the present study utilized the cups task, however different tasks may be distinct in how they measure adaptive decision-making. For instance, the Iowa Gambling Task (Bechara et al., 1994) can also be used to measure adaptive decision-making. However, the cups task has more variation between rounds, and thus is a better indicator of adaptive decision-making. Once the participant determines which deck is risky or not, then the Iowa Gambling Task is just measuring their risk in decision-making, not their ability to change their decision-making per trial. The cups task randomly displays different amounts of cups and different monetary values for each round, therefore there is always a different advantageous decision. Perhaps using a different adaptive decision-making task, such

as the Iowa Gambling Task, would have led to different results. However, the cups task that was used in the present study seemed to be a better indicator of adaptive decision-making.

Limitations and Future Directions

The sample in the present study consisted of exclusively college students from a private midwestern university. College students and other WEIRD—Western, Educated, Industrialized, Rich, and Democratic—samples tend to have particular characteristics that make them unique from the rest of the population (e.g. Henrich et al., 2010). Specifically, college students have high levels of anxiety, depression, and psychological distress, as well as low levels of self-esteem. The proportion of these psychological problems may not be comparable to the general population (Saleh et al., 2017). This fairly nonrepresentative sample is a limitation that should be taken into account when making any conclusions regarding the generalizability of the results.

In addition, another limitation may be the attempt of the present study to manipulate rather than measure self-complexity. Few empirical works have attempted to manipulate self-complexity (Margolin & Niedenthal, 2000; Setterlund, 1994). The present study used the same experimental manipulation as Setterlund (1994), and while the author was able to manipulate self-complexity successfully with university students imagining their future self-aspects, this is one of only a few studies to use an experimental manipulation. With the current manipulation, some people may be unable to imagine themselves possessing a certain self-aspect in the future. For instance, one of the future aspects prescribed to both groups was “as a parent.” Yet some individuals may not want to or may not be able to see themselves having children, and thus it would seem unrealistic to them to imagine that self-aspect. Overall, these factors may make a self-complexity manipulation difficult. Thus, it is possible that the manipulation in the present study was not successful.

Because there was no manipulation check, we cannot be certain if the self-complexity manipulation was valid. The way to measure self-complexity is by utilizing a trait sort task (similar to the one conducted in the present study) in which participants would think of themselves according to however many self-aspects they chose. Those aspects would be counted and their self-complexity determined based on this number. Given that this was a part of the manipulation, we could not use it as a manipulation check. Furthermore, unlike conducting a manipulation check on a more commonly understood variable (i.e. happiness, stress, adventurousness), many people are unfamiliar with what self-complexity is, and therefore it would not be effective to simply ask them how self-complex they are.

In the present study, the self-complexity manipulation was followed by a lengthy adaptive decision-making task, which may have negated or minimized the effect of the manipulation. While self-complexity may have been manipulated successfully in the short term, the participant may have regressed back to their normal self-complexity level by the time they finished taking the adaptive decision-making task and subsequent stress inventory. Therefore, it could be argued that the time delay in between the complexity task and the stress inventory led to a regression of the participant back to their baseline state of self-complexity. Future research could investigate whether self-complexity can be manipulated over long periods of time.

In addition, understanding the potential role of self-complexity in other real-world settings would be valuable. Previous research has investigated self-complexity in leadership settings (Hannah et al., 2013), with regard to mental health (Linville, 1987), and in terms of exposure to political violence (Slone & Roziner, 2013) to name a few. However, understanding how self-complexity may play a role in other contexts may help us further understand how self-aspects form and when they are likely to alter our thoughts or behavior.

Finally, future research should investigate the individual variables in order to further assess their respective relationships. While previous research (e.g. Hannah et al., 2013) outlined above demonstrated relationships between each of the variables in this present study, the present study was unable to replicate these effects. More research could be conducted to further understand these different relationships, and potentially discern various contexts in which the relationships are more strongly demonstrated.

Conclusion

Ultimately, adaptive decision-making did not mediate the relationship between self-complexity and stress. Whereas previous research has indicated relationships between self-complexity and adaptive decision-making, adaptive decision-making and stress, and self-complexity and stress, the present study only found a significant relationship between self-complexity and adaptive decision-making for the "risky loss" trials. No other paths yielded significant relationships. This could have been because self-complexity can be conceptualized as either an actual or cognitive relatedness between self-aspects (Linville, 1985). The present study may have measured cognitive correlation, whereas previous research may have measured actual correlation. Investigating other robust ways to manipulate self-complexity, as well as further investigating the different pathways of the model (e.g. the relationship between adaptive decision-making and stress) are avenues for future research. In addition, understanding the role of self-complexity in other real-world settings would be important in our understanding both of self-complexity, and self-aspects in general.

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Figure 1

Adaptive decision-making as a mediator between self-complexity and stress.

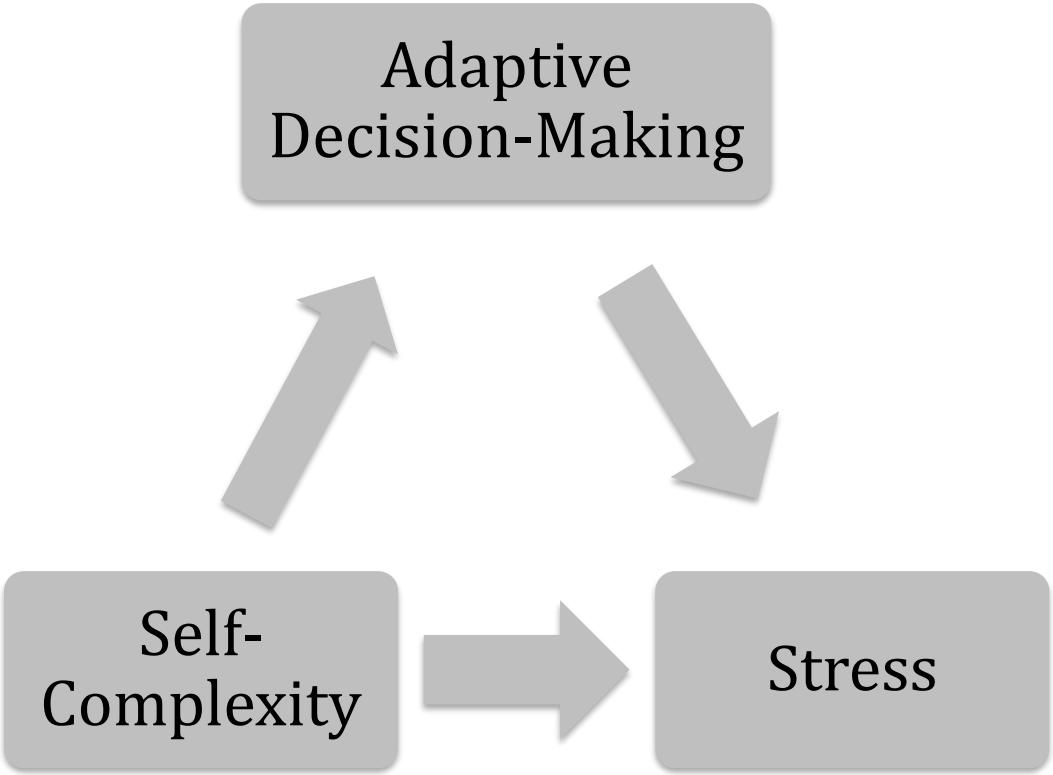
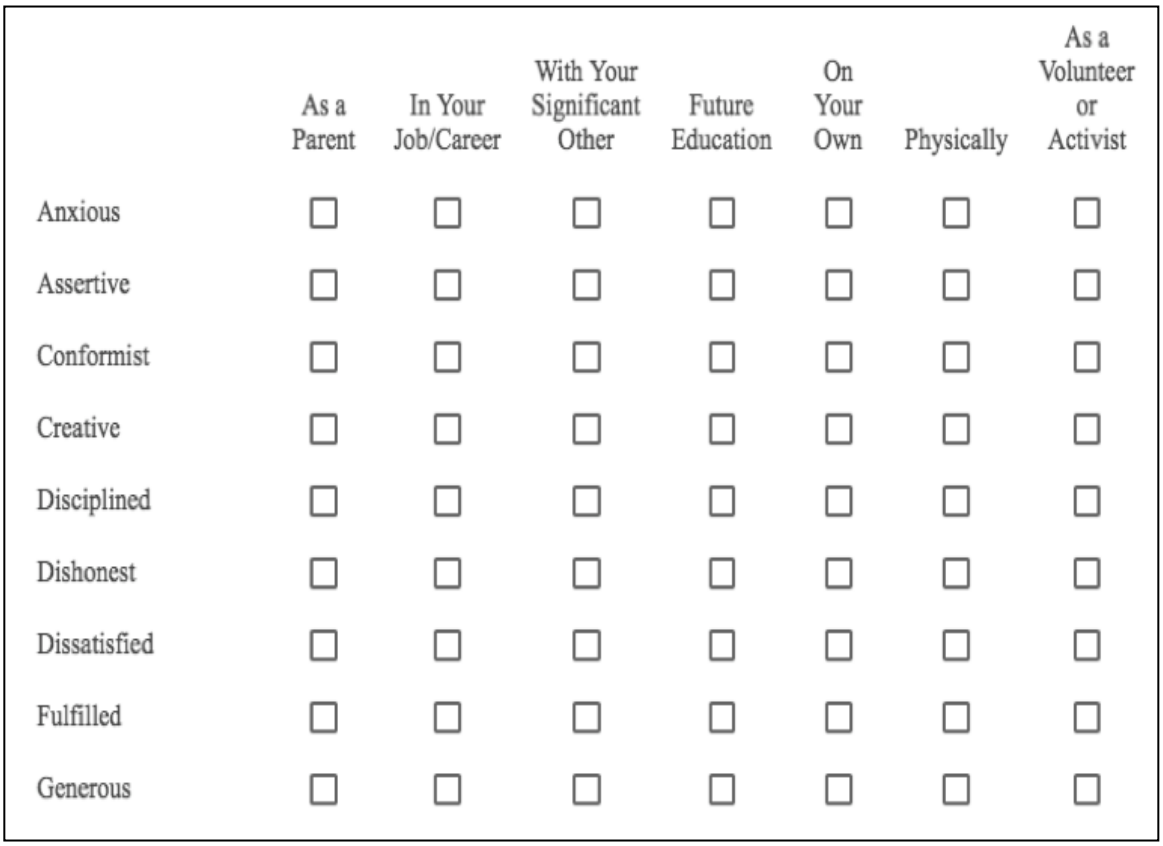


Figure 2

First 9 out of 39 items of the self-complexity task for the "high complexity" group.



	As a Parent	In Your Job/Career	With Your Significant Other	Future Education	On Your Own	Physically	As a Volunteer or Activist
Anxious	☐	☐	☐	☐	☐	☐	☐
Assertive	☐	☐	☐	☐	☐	☐	☐
Conformist	☐	☐	☐	☐	☐	☐	☐
Creative	☐	☐	☐	☐	☐	☐	☐
Disciplined	☐	☐	☐	☐	☐	☐	☐
Dishonest	☐	☐	☐	☐	☐	☐	☐
Dissatisfied	☐	☐	☐	☐	☐	☐	☐
Fulfilled	☐	☐	☐	☐	☐	☐	☐
Generous	☐	☐	☐	☐	☐	☐	☐

Figure 3

Image that participants would see prior to the onset of the task.