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The Development of the Preference for Complexity Scale

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Author's Note

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What draws a person to like the things that they like? For example, why do some people like more abstract artwork whereas others prefer much more realistic images? We hypothesize that many of our preferences in life are determined by our inherent tolerance for complexity. In other words, why we like the things we like is dependent on our individualistic preference for an optimal level of complexity or unpredictability in a given stimulus. Considering music, for example, why do some people prefer music with a more simplistic design such as pop music (i.e., a simple rhythm pattern and minimal intertwining variables such as instruments, harmonies, etc.), while others prefer more complex music, like jazz. This relationship can be seen across a variety of different stimuli (e.g., music, television, literature, artwork, interpersonal relationships, etc.). North and Hargreaves (1995), for instance, found that an individual's liking of a given song correlated with the level of complexity it possesses. Generally, they found that one's optimal level of enjoyment of a given song occurs when the song is of a moderate level of complexity. We believe that one's individual preferences can vary from situation to situation but our overall liking/enjoyment of a stimulus is ultimately dependent on the level of complexity which it possesses. This paper is focused on examining the interaction between the complexity of a given stimuli and the individual differences in our preferences to experience that complexity.

Silvia (2005) argues that one of the most important components of the appraisal process is dependent on a stimulus that is "ambiguous, complex, obscure, uncertain, mysterious, contradictory, unexpected, or otherwise, not understandable" (as cited in Armstrong and Detweiler-Bedell, 2008, p. 322). In other words, what makes something interesting is the level of complexity or uncertainty of a given stimulus. For example, when considering a work of art,

beauty is not necessarily defined as the more straightforward pieces but rather ones having more depth. This does not mean that the work of Picasso, though abstract, is necessarily the most interesting but rather, art that reaches the optimal level of complexity holds the average person's interest. North and Hargreaves (1999) found that overall, higher complexity music was considered less enjoyable in comparison to moderate or low level of complexity music. While this study indicated that moderate to low level complexity was preferred by their participants, the average person, arguably, will tend to seek out a moderate level of complexity. Nonetheless, as North and Hargreaves (1999) confirmed, some people do prefer more complexity, while others prefer less complexity.

According to Berlyne (1960), complexity refers to the level of "variety or diversity in a stimulus pattern" (p. 38). In other words, complexity is the variability of a given stimulus. For example, one can see the level of complexity of a storyline in a film. A movie with multiple intertwining variables such as having numerous plot twists, ambiguous characters, and intricate plot lines can be considered complex because it is dynamic and unpredictable. Arguably, each person has an optimal level of enjoyment of a given stimulus with regards to its complexity. Similar to the example of music and complexity, some people like movies which are more complex (i.e., "Inception") while others prefer more straight forwards movies (i.e., "Mamma Mia!"). Generally speaking, too much complexity decreases enjoyment while not enough complexity can also decrease pleasure of the stimulus. When the stimulus is too complex, the individual becomes overstimulated or frustrated with the experience. On the other hand, if the stimulus is not complicated enough, the individual may find the stimulus to be boring. Essentially there is a curvilinear relationship, or "inverted-U relationship" between complexity

and likeability. The “inverted-U” indicates that the optimal level of stimulus enjoyment falls at a moderate level of complexity (North & Hargreaves, 1995).

As mentioned previously, this relationship is evident in one’s preference for music. If one listens to a song that is too simple, or lacking variation or complexity, one may not find it as enjoyable. The more simplistic song could be perceived as too predictable and lacking novelty. On the other hand, if a song has too much intricacy, such as numerous instruments or variables, that person would equally find it less enjoyable. The added variables to the music could be overpowering the song or adding too many different elements that prevent one from enjoying the song. When faced with a complex stimulus, we often produce a sense of uncertainty as a cognitive/emotional response to the experience. Essentially, as the complexity of a situation increases, more individual processing power is necessary when dealing with the level of complexity which results in a feeling of uncertainty. How a person handles the emotion of uncertainty is dependent on an individual’s personality.

A basic human motivation is to reduce or solve uncertainty in our lives (Arkin, Oleson, & Carroll, 2010). Actively trying to reduce the uncertainty of a situation is often associated with negative emotions such as anxiety and tension. Uncertainty reduction helps to motivate us to end our negative emotions by resolving/moving toward the resolution of said negative emotion (ambiguity, uncertainty, unknown, etc.). There are many personality measures that are predictive of this need to reduce uncertainty in life. For example, according to Hogg (2007), the need for cognitive closure refers to one’s driving desire to reduce the uncertainty in one’s life quickly without worrying about whether they are right or wrong. This construct has been referred to as need for closure (Neuberg, Judice, & West, 1997) and closed-mindedness (Kruglanski, 2004), a willingness to sacrifice something that could be potentially interesting or

fascinating. As a result, a person may only allow themselves limited experiences. In other words, those who are high in a need for closure prefer to experience a high level of certainty. Therefore, we would expect someone low in need for closure to prefer more complex music, film, etc., while those who are high in need for closure to gravitate towards more simplistic stimuli (music, film, etc.). This phenomenon can also be seen in the relationship between curiosity and the level of uncertainty a stimulus possessed. Many researchers have put forth the idea that an individual's curiosity and the desire to seek out uncertainty is a result that organisms seek out stimuli that produces an optimal arousal to which they find pleasurable. However, a stimulus which causes an organism to be either underaroused or overaroused produces a less pleasurable or even unpleasant experience (Berlyne, 1967; Hebb, 1955; Leuba 1955 as cited in Litman & Jimerson, 2004). Essentially, the amount of uncertainty we choose to seek out or are curious about reaches that optimal level. Some prefer more uncertainty, while others prefer less certainty; however on average, people are more curious about a stimulus that is not too predictable or boring or having too much uncertainty or anxiety-inducing properties. Past research contends that the exploration behavior of seeking out uncertain stimuli is aimed at increasing arousal because it leads to positive emotion (Knobloch-Westerwick & Kepling, 2006).

That being said, what makes someone more equipped to handle complexity and the resultant uncertainty that accompanies that complexity? It is possible that individual differences in one's cognitive resources may predict one's tolerance for complex situations. Webster-Nelson, Klein, and Irvin (2003) examined how diminished cognitive resources and need for closure affect empathy. Participants who were high in a need for closure and under cognitive strain (mental fatigue) were asked to observe a target's response to a negative experience (becoming either guilty or disappointed at failing socialization) and then rate their opinion of the target's

responses. Targets, in this study, were individuals who were described as either sharing the same beliefs as the participants or as holding opposing beliefs. The results were that the participants tended to be more compassionate towards the targets who shared their beliefs and less empathetic towards those who were different. Also noteworthy, participants were less likely to show empathy to those different from them when under mental fatigue. That effect was not seen toward the targets that were similar (as cited in Kruglanski, 2007). Essentially, the participants who were high in a need for closure were more likely to find the person with similar beliefs to be more relatable, were more certain about these people, and thus, more supportive about their choices. The opposite was found with the targets that had differing beliefs. Those targets were considered to be different, were perceived to be more complex, and the participants were less trusting of their decisions and uncertain about their stance on issues. When under mental fatigue, the participants who were high in a need for closure were especially likely to use heuristics (mental shortcuts) or stereotypes to bring an end to the uncertainty of the situation. A high need for closure indicates a low need for cognition or desire to think where as an individual who is low in need for closure will be higher in need for cognition, preferring more mental stimulation (Onraet, Van Hiel, Roets, & Cornelis, 2010). People who are high in a need for closure tend to have less cognitive resources which make processing complexity difficult and thus, they tend to prefer simpler stimuli. The opposite is also true for people who are low in need for closure. Those individuals, even while under mental strain, will prefer complexity due to having more cognitive resources. This tells us that someone's cognitive resources can be a determining factor in one's preferences for complexity. A variable that correlates with individual differences in cognitive resources is found in Cacioppo and Petty's need for cognition scale.

Cacioppo, Petty, and Kao (1984) describe need for cognition as “an individual’s tendency to engage in and enjoy effortful cognitive endeavors” (p. 306). In other words, need for cognition is understood as one’s desire for mental stimulation. A person who is high in a need for cognition tends to be more curious or excited about complexity and is more stimulated and responsive when placed in a more uncertain situation or given a more complex stimulus. People who are higher in a need for cognition have been shown to prefer more difficult to understand books, music, movies, etc., those that are more complex in nature, more so than someone who is low in a need for cognition. Knobloch-Westerwick and Kepling (2008) found that participants with a high need for cognition enjoyed mystery stories the most when the plot exhibited a moderate level of complexity. Their results indicated a significant interaction between need for cognition and complexity of a mystery story. Those high in need for cognition liked the medium complexity the most followed by high then low complexity, whereas those with low and moderate levels of need for cognition overall preferred the lowest complexity mystery the most with their liking of the mystery decreasing as the complexity level increased. In other words, generally speaking, the majority of participants preferred the simpler story; nonetheless, those with a high need for cognition follow the predicted inverted-U relationship between enjoyment and complexity. These results, along with previously mentioned research, indicate the necessity for measuring individual differences in one’s tolerance for complex situations and stimuli. One of the most commonly studied influences on one’s tolerance for different and, arguably, more complex situations/stimuli can be found in the Big Five Inventory: Openness to experience.

Openness to experience is “conceived of as a broad and general dimension that manifests itself in the vividness of fantasy, artistic sensitivity, depth of feeling, behavioral flexibility, intellectual curiosity, and unconventional attitudes...” (NEO-PI-R; Costa & McCrae, 1992, as

cited in Kruglanski, 2007, p. 53). Arguably, a person who is high in openness to experience should be more able to tolerate complexity. Openness has been found to be predictive of one's ability to better handle new stimuli (Digman, 1990; John, 1990). On average, studies (Costa & McCrae, 1992) have shown that people who are high in openness tend to be better equipped to cope with "novelty, variety, and intense experience" where as those who are low in openness prefer "familiarity, routine and tradition" (as cited in Onraet, Van Hiel, Roets, & Cornelis, 2010, p. 184). Further, Costa & McCrae's (1992) NEO-questionnaire (which divides openness to experience into six facets) describes a factor of "openness" to be openness to ideas or intellectual curiosity (as cited in Onraet, Van Hiel, Roets, & Cornelis, 2010, p. 184). As mentioned previously, a preference for complexity may be correlated with one's need for cognition or preference for mental stimulation. Therefore, it can be argued that a person who is high in openness to experience, and thus more intellectually curious, may prefer more complex stimuli. As a result, the opposite could be argued as well, namely, a person who is low in openness would be less intellectually curious and, therefore, less likely to prefer complexity. This preference for complexity, as previously discussed, may then be dependent on the individual themselves or their situation/environment. Furthermore, preference for complexity may be experienced as an ability to handle higher levels of uncertainty in those situations and environments.

According to Wilson, Centerbar, Kermer, and Gilbert (2005), one's natural response to uncertainty is referred to as the "Pleasure Paradox." This paradox explains that when the level of uncertainty increases, one's pleasure or enjoyment of the situation also increases; when the uncertainty level decreases, one's pleasure of the experience also decreases. For example, when going on a blind-date, the less information known about the person tends to create a higher level of anxiety. This desire to find out more about the individual tends to increase one's pleasure of

the experience. This is different from a date with a familiar partner where low levels of uncertainty about the outcome of the encounter creates a less pleasurable experience due to the lack of new information gained from the interaction. In fact, this same study found that despite participants overall perception that they would be happier in a more certain situation, results indicated the exact opposite, namely, people were happier (and that effect lasted longer) when experiencing a more uncertain situation.

Again, we see the pattern of results that individuals prefer to seek out the optimal level of tolerable complexity or the optimal level of uncertain stimuli which in turn affects how we perceive it. However, this level varies from person to person due to our individual differences (e.g., need for cognition, need for closure, open/closed mindedness, etc.). With a few exceptions, there has not been any research conducted which has linked these ideas together. As noted earlier, one exception can be found in the research of Knobloch-Westerwick and Keplinger (2008). Nonetheless, all of the constructs have been designed for specific areas of study and their instruments (i.e., scales) have been designed to measure that specific area. We contend that these elements are pieces of a larger theoretical construct of preference for complexity. While similar to the constructs of need for closure, openness to experience, and need for cognition, our scale is designed to be independent and more general in predicting one's individual preference for complexity.

These stimuli are not only complex but are dynamic in the sense that they are constantly changing over time. Often what we are interested in is a pattern or rhythm that continues throughout the different stages of life. Essentially, complexity is not just a snapshot of time or a specific instance or stimuli but is more of an interaction or pattern throughout a person's experience. As a result, our brain is interested in or drawn to these patterns or interesting

complex stimuli. According to Nowak, Vallacher, and Zochowski (2001), our mind is a complex system. For our purposes, complex systems refer to the concept that “individuals are not static or passive entities but rather can be viewed as separate systems capable of displaying complex patterns of thought and behavior over time” (p. 293). In other words, the complex system of the human mind is constantly changing and adapting over time and responds to different situations in life through complex patterns of ideas and thoughts. These patterns and thoughts are highly focused on the idea of synchronization (Nowak, Vallacher, & Zochowski, 2001). These researchers define synchronization as referring “to the fact that the actions, thoughts, and feelings of one person are temporarily related to the actions, thoughts, and feelings of one or more other people” (p. 295). In their research, they relate this construct to the concept of uncertainty. Synchronization patterns, when trying to connect in behavior with others, can produce a feeling of discomfort until both are finally able to synchronize. This synchronization produces a positive experience in the process of solving uncertainty. The individual is at a constant state of trying to synchronize, whether it is with a person, situation, or stimulus (i.e., music, film, literature, etc.). For example, when working with another person, one might need to change his or her approach in order to be most effective. A study by Nowak, Vallacher, and Zochowski (2001) found that the bond formed between similar others tends to be easier to accomplish when the similar behaviors, patterns, and personalities of individuals are involved. When working with a person who is different, the synchronization takes longer and requires more work and change to adapt to different perspectives and approaches. In another variation of their study, they also found that there were stronger bonds formed when one participant had to adjust to match his or her partner more so than was seen when the participants were similar (Nowak, Vallacher, and Zochowski, 2001). This occurred because the dissimilar partners had to

undergo change and work harder together, creating a stronger bond. This effect did not happen as much with those who were similar due to the fact that it took less effort to create a bond. This relationship follows a similar pattern to the example of complex music. When listening to a more complex song, oftentimes it takes longer to process to enjoy. This process often produces a greater (and enjoyable) experience. Csikszentmihalyi (1999) describes a similar experience through the interaction between the optimal level of complexity and one's level of skill: "flow."

According to Csikszentmihalyi (1999), "flow" experience is defined as "the state of total involvement in an activity that requires complete concentration." Essentially, "flow" refers to enjoyment and is the optimal level of task difficulty paired with the optimal level of an individual's skill/abilities. For example, when playing a guitar, each musician has a different skill level, a beginner who has been playing for a few weeks all the way to Eric Clapton, who has been a guitarist over fifty years (Gulla, 2008). In order for any musician to experience flow, a piece of music has to be at different levels of difficulty. While learning "Country Roads" may be enjoyable to the guitarist of a few weeks, learning to play such a song would be tedious for Eric Clapton. The same could be said in reverse. Learning to play a Spanish classical piece might be more enjoyable for Eric Clapton due to the difficulty level of that song and would be less pleasurable and nearly impossible for the newer musician. Nakamura and Csikszentmihalyi (2002), examined the relationship between the difficulty of a task and one's capabilities and found that when the task difficulty and individual skill levels do not match, the result is often anxiety (if the task is too difficult) or boredom (if the task is too easy). However, when the optimal level of difficulties and skills are reached, one gains a feeling of being "in the zone."

Flow seems to follow the larger construct of preference for complexity. We hypothesize that each person falls on a continuum of preference for complexity and that preference is related

to the level of complexity of a given stimulus. We predict there to be a similar relationship as found in flow:

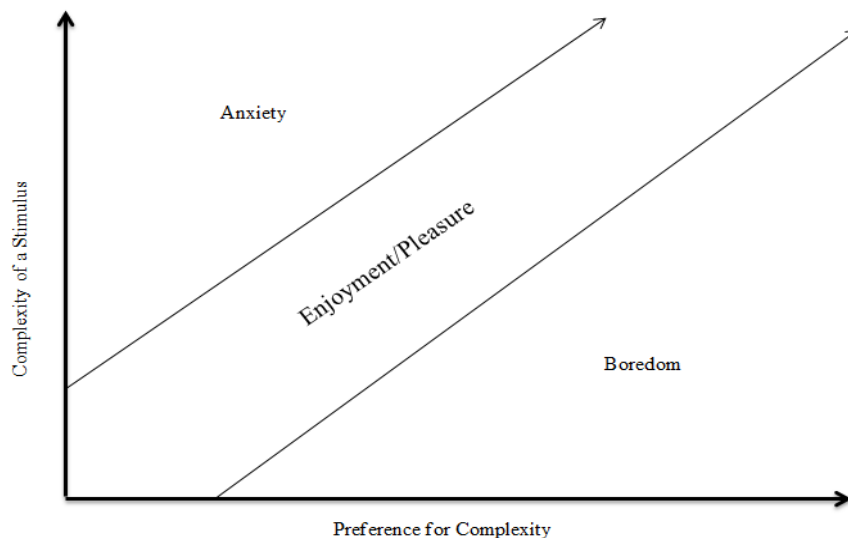


Figure 1. Relationship between Preference for Complexity and the complexity of a stimulus (Urecki & Buchholz, 2012).

As the graph indicates, we hypothesize that preference for complexity or uncertainty varies from person to person depending on a given stimulus.

In summary, we contend that there is a phenomenon that involves the complexity of a situation and one's specific personality qualities. Each person has a unique level of tolerance for complexity of a situation, person, or stimuli which we believe is connected to some of our innate personality variables. Those variables are referred to as the constructs such as need for closure, openness to experience, and need for cognition but each of those constructs focuses only on what they were designed to emphasize (i.e., need for cognition which only focuses on one's need/preference for cognition). This scale is designed to be more inclusive of not only the aforementioned constructs but also hopes to cover a broader range of personality. Not only do the properties of stimuli (i.e., complexity, simplicity) affect our reaction to said stimuli, but there

appears to be individual differences that determine what level of complexity is optimal for each individual. The development of the preference of complexity scale is designed to measure where a person falls on the continuum of preference for complexity/uncertainty.

The preference for complexity scale is intended to replace the need for multiple personality measures in our research, more specifically, Big Five Inventory, Need for Closure, Need for Cognition, and Uncertainty Response Scale. We hope that our scale will correlate with the information collected in these past scales but will go beyond these specific topics to encompass a much broader category of personality variables.

The scale has been developed through a collaboration of questions from both a more general category (i.e., general traits) as well as a more domain specific category (i.e., music, movies, film, etc.). Using the already existing constructs (big five factors, need for closure, need for cognition, and uncertainty response scale) as a guide, we developed a scale of about 89 items which were divided into categories: General Situation Preferences, Cognitive Tasks, Social Situations, Film and Television, Books and Literature, and Music Preferences. In Study 1 and 2, we were trying to develop a scale that measures preference for complexity. For Study 1, we tested the 89-item scale against several personality surveys which measure similar constructs. In Study 2, we looked to replicate Study 1 and also examined how the Preference for Complexity Scale correlates with various self-reported behaviors.

Study 1

This study is the first run of our scale in comparison to Need for Closure, Need for Cognition, Uncertainty Response Scale, and the Big Five Inventory.

Methods

Participants

The sample of participants included over 130 individuals over the age of 18. Both male and female genders participated in the completion of this study. In exchange for voluntary participation, participants received credit from a professor for their class (if applicable) during the summer of 2012. The collection of the data for this study was conducted using Facebook and email. The survey was entered into a Google Doc which created a link that allowed the researchers to email it to participants. The participants, prior to completing the study, were asked to read and sign a consent form for their participation.

Materials

Preference for Complexity Questionnaire (Appendix A): The first scale used was our designed Preference for Complexity Scale. This scale was compared to the other prior measures as a way to replace them in future scales and is a 32-item questionnaire that is divided into categories specific to domains or topics: Social Preferences, Cognitive Preferences, Film Preferences, and Music Preferences. These allow for a broader assessment of personality variables. Participants were to select their response to given questions following a seven-point Likert scale where 1 is “Strongly Disagree” and 7 is “Strongly Agree.” The Social Preferences covered statements that assessed one’s comfort in social situations. Participants were given statements such as: “I prefer structure/planned activities.” and “I like surprises.” The Cognitive Preferences section had statements that assess one’s preferences for tasks that make one think: “I prefer routine tasks that you do NOT have to think a lot.” and “I like being presented with difficult tasks that test my problem solving abilities.” As the title explains, the Film Preferences

section assessed one's likes of different movie qualities: "I do NOT like movies that make me think about my life." and "I like movies that have a clear ending." Finally, the Music Preferences scale described one's tastes in music: "I enjoy listening to songs I have never heard of" and "When listening to music, I prefer to stick to an artist I am familiar with."

Closed-Mindedness Questionnaire: The questionnaire to be used to get at the participant's personality is the Nueberg, Judice, and West (1997) Need For Closure (NFClo) scale. The NFClo scale is a 42-item survey that addresses personal desire for closure. The NFClo scale uses a 6-point Likert scale that ranges from 1 (strongly disagree) to 6 (strongly agree). Some of the questions that will be asked include: "Even after I've made up my mind about something, I am always eager to consider a different opinion." and "When faced with a problem I usually see the one best solution very quickly."

Cognitive Ability Questionnaire: To assess each participant's cognitive ability, the Cacioppo and Petty (1982) Need for Cognition (NFCog) scale is used. The NFCog scale is an 18-item questionnaire that addresses the need for cognition and an individual's desire to seek out people or situations that stimulate thinking. The scaling has four responses from 1 – 4 where 1 is completely false, 2 is mostly false, 3 is mostly true, and 4 is completely true. The survey offers questions such as: "It's enough for me that something gets the job done; I don't care how or why it works." and "I really enjoy a task that involves coming up with new solutions to problems."

Uncertainty Questionnaire: The questionnaire is to be given in order to determine each participant's comfort with uncertainty. The Greco and Roger (2001) Uncertainty Response Scale (URS) is a 48-item questionnaire that focuses on the individual's responses to uncertain situations. This questionnaire has four possible numerical responses (1 – 4). The participants could respond with: 1 – Never, 2 – Sometimes, 3 – Often, and 4 – Always. The questionnaire

ask participants to respond to questions like: “I enjoy unexpected events” and “I feel anxious when things are changing.”

Personality and Trait Questionnaire: To measure aspects about each individual’s personality and personality traits, the Big Five Inventory (BFI) by John and Benet-Martinez (1998) is used to assess and measure each participant’s level based on the five personality traits: Openness to Experience, Conscientiousness, Extroversion, Neuroticism, and Agreeableness. BFI is a 44-item questionnaire that asks the participant to rate themselves from 1 (disagree strongly) to 5 (agree strongly). For example, participants will be asked to rate agreement or disagreement to pairs of traits such as: “Is curious about many different things.” and “Has few artistic interests.”

Procedure

Since this study is conducted completely online, participants were sent an email with a link to the Google Doc site where the scale is uploaded. Participants were first asked to read and sign a consent form. Upon signing, the participants were then asked to respond to the following statements from the questionnaire packet. The questionnaires include scales such as the Preference for Complexity Scale, Need for Closure (NFClo), Need for Cognition (NFCog), Uncertainty Response Scale (URS), and the Big Five Inventory (BFI). They were told to answer the questions honestly and truthfully and were assured that their personal information and answers will remain confidential. Additionally, the participants were assured that there will be no way of connecting their identity to their answers. Upon completion, the participants were given a unique code to email to their professor to receive credit and were told to click submit to end the survey. Once the survey was submitted, the participant can receive full credit for participation and were able to exit the Google Doc page.

Results and Discussion

When we created the Preference for Complexity Scale, we first developed an 89-item questionnaire which was brainstormed by members in our lab to develop a wide range of areas exploring complexity in one's life. In looking at these items, they tended to fall into five categories (Preference for Complexity, Preference for Social Complexity, Preference for Cognitive Complexity, Preference for Complex Films, and Preference for Music Complexity). When examining the inter-item correlation from the reliability analysis, we were able to reduce the scale down from 89 to 32 items. Cronbach's Alpha is $r(30) = .876$ for the total average of Preference for Complexity. Additionally, we found that the individual sections of our questionnaire (Preference for Social Complexity, Preference for Cognitive Complexity, Preference for Complex Films, and Preference for Complex Music) also had a high reliability. The Cronbach's Alpha for each of the sections respectively were: $r(9) = .801$, $r(7) = .806$, $r(7) = .814$, and $r(7) = .817$.

The results from our analysis indicated that our Preference for Complexity Scale had a strong pattern of correlation with related constructs. In other words, our results showed convergent validity (see Table 1). While there were a few exceptions (i.e., Preference for Social Complexity which was negatively correlated with Neuroticism, $r(131) = -.467$, $p < .001$), the Preference for Complexity Scale illustrated discriminant validity. As predicted, our scale did not correlate with most of the Big Five Factors, with the exception of openness to experience (see Table 2).

Study 2

The Preference for Complexity Scale was again tested to see if we could replicate the findings from Study 1, as well as begin examining the relationship this scale has with elements

such as behavior. In Study 2, we examined the relationship between personal preferences and participants' behaviors on weekly, monthly, and a more general basis. Our scale was compared with the same personality measures as was used in Study 1 to test the validity of the scale. Additionally, we hoped to explore how our scale could help in predicting individuals' preferences as they pertain to specific behaviors. Finally, we hoped to show that the results of Study 1 would be consistent with the findings of Study 2.

Methods

Participants

The sample of participants included over 60 individuals over the age of 18 obtained from Roanoke College Psychology classes. In exchange for voluntary participation, participants received credit from their professors (if applicable) during the Spring 2013 semester. The survey was entered into two separate Google Docs which created links that allowed the researchers to enter them directly into SONA for the participants to use. Participants, prior to completing the study, were asked to read and sign a consent form for their participation and upon completion were asked to email an alphanumeric code to the researcher to obtain credit.

Materials

Behavior Questionnaire (Appendix B): Participants were given an 83-item questionnaire assessing different behaviors they engage in on a weekly, monthly, and more general basis. The Behavior Questionnaire is a self-report survey broken down into 53 weekly behaviors and 10 monthly behaviors which can be answered as occurring: 0 times, 1-3 times, 4-6 times, 7-9 times, or 10+ times. These are then broken down into six main categories (examples of each category are included): Risk Behaviors (RB) - "How often do you smoke PER WEEK?", Escape Activities (EA) - "How often do you go out to parties PER MONTH?", Novelty Activities (NA)

– “How often do you hang out with the same group of friends PER MONTH?”, Good Health Behaviors (HB) – “How often do you eat healthy PER WEEK?”, Education Behaviors (ED) – “How often do you read ahead for class PER WEEK?”, and Emotional State (ES) – “How often do you feel happy PER WEEK?”.

In addition, participants were given 16 additional items asking them the frequency in which they engage in certain general activities. These items were broken down into: Travel Experience (TE) – “How frequently have you been abroad?” and Schedule Load (SL) – “How frequently are you involved in multiple activities?” For these questions, participants responded with either: Often, Occasionally, Sometimes, or Never. The final portion of the Behavior Questionnaire had 4 questions which assessed a participants’ agreement or disagreement to Success Activities (SA) such as “I maintain a high GPA.” Participants ranked their responses on a 1 – 4 scale where 1 is Strongly Agree, 2 – Agree, 3 – Disagree, and 4 – Strongly Disagree.

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variables. Participants were to select their response to given questions following a seven-point Likert scale where 1 is “Strongly Disagree” and 7 is “Strongly Agree.” The Social Preferences cover statements that assess one’s comfort in social situations. Participants were given statements such as: “I prefer structure/planned activities.” and “I like surprises.” The Cognitive Preferences section has statements that assess one’s preference for tasks that makes one think: “I prefer routine tasks that you do NOT have to think a lot.” and “I like being presented with difficult tasks that test my problem solving abilities.” As the title explains, the Film Preferences section assesses one’s likes of different movie qualities: “I do NOT like movies that make me think about my life.” and “I like movies that have a clear ending.” Finally, the Music Preferences scale describes one’s tastes in music: “I enjoy listening to songs I have never heard of” and “When listening to music, I prefer to stick to an artist I am familiar with.”

Procedure

Since this study was conducted completely online, participants were to sign up on SONA which contained the link to the Google Docs site (Part I of the set of scales) where the behavioral scale is uploaded. Participants were first asked to read and sign a consent form. Upon signing, the participants were then asked to respond to statements from our Behavior Questionnaire. Upon completion of the first Google Doc (referred to as Part I), participants were sent a link to a second Google Doc (Part II) which contained a battery of questionnaires in order to complete the entire study.

The questionnaires of Part II included scales such as the Preference for Complexity Scale, Need for Closure (NFClo), Need for Cognition (NFCog), Uncertainty Response Scale (URS), and the Big Five Inventory (BFI). They were told to answer the questions honestly and truthfully and were assured that their personal information and answers will remain confidential.

Additionally, the participants were assured that there will be no way of connecting their identity to their answers. Upon completion, the participants were given a unique code that was to be emailed to the researcher to receive credit and were told to click “submit” to end the survey. Once the survey was submitted, the participant could receive full credit for participation and were able to exit the Google Doc page. The researcher upon receiving, the code, would then be able to mark credit on SONA so the participant could gain full credit for their participation.

Results and Discussion

With the Preference for Complexity, we tested the overall reliability as well as the reliability of each section of our questionnaire. We found that our scale had a high overall reliability (Cronbach’s Alpha is $r(30) = .866$). This reliability measure was comparable to Study 1. Additionally, we found that the individual sections of our questionnaire (Preference for Social Complexity, Preference for Cognitive Complexity, Preference for Complex Films, and Preference for Complex Music) also had a high reliability. The Cronbach’s Alpha for each of the sections, respectively, were: $r(9) = .724$, $r(7) = .739$, $r(7) = .801$, and $r(7) = .748$. All of these results were comparable to Study 1.

After reducing the items, we used the same composites (Preference for Complexity, Preferences for Social Complexity, Preference for Cognitive Complexity, Film Complexity Preferences, and Music Complexity Preferences) to compare the participants’ responses to their answers from the other personality questionnaires. The other personality measures included: Preference for Order, Preference for Predictability, Decisiveness, Discomfort with Ambiguity, Closed-Mindedness, Need for Cognition, Overall Uncertainty, Emotional Uncertainty, Desire for Change, and Cognitive Uncertainty. The results from our analysis indicated that our Preference for Complexity Scale had a strong pattern of correlation with related constructs. In other words,

our results showed convergent validity (see Table 3). While there were a few exceptions (i.e. Preference for Social Complexity which was negatively correlated with Neuroticism, $r(63) = -.381$, $p = .002$), the Preference for Complexity Scale illustrated discriminant validity. As predicted, our scale did not correlate with most of the Big Five Factors (with the exception of openness to experience). Overall, the pattern of results was consistent to Study 1 (see Table 3 and Table 4).

Out of all the behavior items we created for the Complex Behaviors survey, we developed a composite of eight of these items that seemed to indicate more complex behavior. The Complex Behavior measure had a Cronbach's Alpha of $r(8) = .660$, a moderately high score. Only Preference for Social Complexity was significantly correlated with our Complex Behaviors questionnaire, $r(63) = .369$, $p = .003$. As far as the other sub-categories, Preference for Complexity was the only measure which approached significance.

Conclusion

As stated previously, we hypothesized that each person falls on a continuum of preference for complexity and that preference is related to the level of complexity of a given stimulus. We also hypothesized that preference for complexity or uncertainty varies from person to person depending on a given stimulus. We contend that there is a phenomenon that involves the complexity of a situation and one's specific personality qualities. Each person has a unique level of tolerance for complexity of a given stimuli and we believe that this relationship is connected to some of our innate personality variables. Those variables include constructs such as need for closure, openness to experience, and need for cognition, but each of those constructs focuses only on what they were designed to emphasize (i.e., need for cognition only focuses on one's need/preference for cognition). Our scale is designed to be more inclusive of not only the

aforementioned constructs but also hopes to cover a broader range of personality variables. Not only do the properties of stimuli (i.e., complexity/simplicity) effect our reaction to said stimuli, but there appears to be individual differences which determine one's optimal level of complexity. The development of the Preference for Complexity Scale is designed to measure, as well as predict, where a person falls on the continuum of preference for complexity.

As our results indicated through both Study 1 and Study 2, we have been able to see some success with this new scale in correlating with the measures of the past. We contend that with further testing of this measure, the Preference for Complexity Scale could potentially be used in place of some personality measures of the past. We hope to explore the use of this scale and how we can move from the theoretical to the more applicable practice of researching behaviors and tendencies.

Future Research

With future research and studies based on the results of Study 1 and 2, we have quite a number of directions to explore. The first direction that can be examined is the effects of our scale across a wider participant pool. In other words, we could potentially give our survey to participants not just within the freshman to senior ages of undergraduate education but also see if a relationship exists across a larger spectrum (i.e., the elderly, etc.). This may provide us with greater variation and a wider distribution in our data set due to differences in age. Some other changes to our study could include making improvements to the phrasing and formatting of our questions so that they are more specific and direct. We might also like to go into more exploration of actual behaviors rather than simply self-reporting. Our behavior questionnaire was more of an exploratory survey. Since a self-report behavior measure can be affected by participant bias (where the participant would want to try to please the researcher or not want to

researcher to know how they actually act), the recording of actual behavior as it directly occurs could essentially eliminate this bias and produce some substantial results.

Further, we could explore areas such as how the results would be different at various points in the semester (for example: the beginning of the year versus finals week). We could expect to find that participants around finals week would not seek out as much complexity whereas in the beginning of the semester, students may be more likely to seek out complexity. Finally, we might want to see how our results could be applied to other areas of study. For example, we could explore how our scale could one day be used to help understand political voting, relationship interactions, etc. We hope to be able to continue to use our scale in our studies within our lab. We are planning to eventually publish our findings and work toward application of said research in the aforementioned areas.

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Table 1. Correlations between Preference for Complexity and related constructs (Study 1).

	Preference for Complexity	Preference for Social Complexity	Preference for Cognitive Complexity	Preference for Complex Film	Preference for Complex Music
Need for Closure					
Preference for Order	-.406** .000 131	-.524** .000 131	ns. .000 131	-.192* .028 131	-.219* .012 131
Preference for Predictability	-.678** .000 131	-.789** .000 131	-.333** .000 131	-.342** .000 131	-.390** .000 131
Decisiveness	ns. .000 131	ns. .000 131	.273** .002 131	ns. .000 131	ns. .000 131
Discomfort with Ambiguity	-.502** .000 131	-.397** .000 131	-.426** .000 131	-.370** .000 131	-.226** .009 131
Closed-mindedness	-.530** .000 131	ns. .000 131	-.569** .000 131	-.432** .000 131	-.388** .000 131
Need for Cognition					
Need for Cognition	.664** .000 131	.269** .002 131	.760** .000 131	.528** .000 131	.387** .000 131
Uncertainty Response Scale					
Overall Uncertainty	-.603** .000 131	-.765** .000 131	-.350** .000 131	-.267** .002 131	-.261** .003 131
Emotional Uncertainty	-.460** .000 131	-.575** .000 131	-.325** .000 131	-.208* .017 131	ns. .000 131
Desire for Change	.701** .000 131	.699** .000 131	.488** .000 131	.356** .000 131	.411** .000 131
Cognitive Uncertainty	-.215* .013 131	-.459** .000 131	ns. .000 131	ns. .000 131	ns. .000 131

* $\alpha = .05$ ** $\alpha < .001$

Table 2. Correlations between Preference for Complexity and the Big Five Inventory (Study 1).

	Preference for Complexity	Preference for Social Complexity	Preference for Cognitive Complexity	Preference for Complex Film	Preference for Complex Music
Big Five Inventory					
Extraversion	ns.	.286** .001 131	ns.	ns.	ns.
Agreeableness	ns.	ns.	ns.	-.205* .019 131	ns.
Conscientiousness	ns.	-.323** .000 131	.173* .048 131	ns.	ns.
Neuroticism	-.351** .000 131	-.467** .000 131	-.313** .000 131	ns.	ns.
Openness to New Experience	.585** .000 131	.247** .004 131	.571** .000 131	.410** .000 131	.478** .000 131

* $\alpha = .05$

** $\alpha < .001$

Table 3. Correlations between Preference for Complexity and related constructs (Study 2).

Table 4. Correlations between Preference for Complexity and the Big Five Inventory (Study 2).

	Preference for Complexity	Preference for Social Complexity	Preference for Cognitive Complexity	Preference for Complex Film	Preference for Complex Music
Need For Closure					
Big Five Inventory					
Order Extraversion	.252* .046	.348** .005	ns.	.39*	ns.
Preference for Predictability	-.636** .000	-.722** .000	-.394** .003	-.387** .004	-.299* .027
Agreeableness	.378* .016	.008 .63	.506** .001	ns.	ns.
Decisiveness	.40*	ns.	.284* .024	ns.	ns.
Conscientiousness Discomfort with Ambiguity	-.503** .000	-.518** .000	-.361** .004	-.403** .001	ns.
Neuroticism	-.285* .063	-.381** .002	-.397** .001	.83	ns.
Closed-mindedness	-.641** .000	-.413** .003	ns.	-.459** .002	-.630** .000
Openness to New Experience	.661** .000	.414** .001	.413** .001	.506** .000	.578** .000
Need for Cognition	.63	.63	.63	.63	.63
* $\alpha = .05$	.648**	.252*	.802**	.494**	.428**
** $\alpha < .001$	.000	.046	.000	.000	.000
	.63	.63	.63	.63	.63

Uncertainty Response Scale					
Overall Uncertainty	-.654** .000 .63	-.733** .000 .63	-.421** .001 .63	-.439** .000 .63	-.292* .020 .63
Emotional Uncertainty	-.542** .000 .63	-.587** .000 .63	-.447** .000 .63	-.307* .014 .63	-.261* .039 .63
Desire for Change	.729** .000 .63	.664** .000 .63	.519** .000 .63	.546** .000 .63	.382** .002 .63
Cognitive Uncertainty	ns.	-.288* .022 .63	ns.	ns.	ns.

* $\alpha = .05$

** $\alpha < .001$

SAMPLE

Appendix A

Preference for Complexity Scale (32-Item)

Personal Preferences Questionnaire

We are interested in finding out what you like or dislike. Thus, this questionnaire is designed to assess your preferences in a variety of situations. These are broken into different categories, reflecting different components of your life. Please respond to each statement as honestly as possible:

Strongly Disagree

Strongly Agree

1

2

3

4

5

6

7

Social Preferences

- ___ 1. I like surprises.
- ___ 2. I like to be spontaneous and seek out new experiences.
- ___ 3. If things do not go as they were planned, I become anxious.
- ___ 4. I prefer structured/planned activities.
- ___ 5. I get nervous going to places that I have never been to before.
- ___ 6. Busy environments, such as crowds, make me anxious.
- ___ 7. I like having a plan when spending time with friends.
- ___ 8. I like having friends that are unpredictable at times.
- ___ 9. I enjoy putting myself in new or unfamiliar situations.

Cognitive Preferences

- ___ 10. When choosing my class schedule I select classes that will challenge me.
- ___ 11. I prefer routine tasks that you don't have to think a lot.
- ___ 12. I feel overwhelmed when presented with a task that needs to be completed in a short amount of time.
- ___ 13. I enjoy doing activities that make me think.
- ___ 14. I like being presented with difficult tasks that test my problem solving abilities.
- ___ 15. I feel annoyed when a question has more than one answer.

_____ 16. I enjoy coming up with new solutions to problems.

Film Preferences

_____ 17. I enjoy movies that do not have a clear hero or villain.

_____ 18. I do not like movies that make me think about my life.

_____ 19. Some of the movies that I like the most required several viewings to fully appreciate.

_____ 20. Movies with a dark tone are not for me.

_____ 21. I like movies that have a clear ending.

_____ 22. I dislike movies that are difficult to understand.

_____ 23. The movies I watch should have a happy ending.

_____ 24. Movies are an important part of my life.

Music Preferences

_____ 25. I like a variety of music from many different genres.

_____ 26. When listening to music I prefer to stick to an artist I am familiar with.

_____ 27. I like music that makes me think.

_____ 28. Some of my favorite songs are ones that took me a while to really appreciate.

_____ 29. I enjoy listening to songs I have never heard before.

_____ 30. I do not like music that is too complex or intricate.

_____ 31. Most of the music that I listen to has many different instruments and parts.

_____ 32. Music is an important part of my life.

Appendix B
Behavior Questionnaire

SAMPLE

Low-Medium-High Behavior Questionnaire

We are interested in finding out what are some of your typical behaviors on a daily, weekly, and more general basis. Thus, this questionnaire is designed to assess your behaviors in a variety of situations. Please respond to each statement as honestly as possible.

How often does this behavior occur per week?

0 times 1-3 times 4-6 times 7-9 times 10+ times

Risk Behaviors (RB)

1. Smoke.
2. Procrastinate.
3. Eat junk food.

Escape Activities (EA)

4. Read for pleasure.
5. Complete puzzles.
6. Watch T.V.
7. Participate in a mentally challenging game like chess.
8. Play/participate in sports.
9. Play videogames.

Good Health Behaviors (HB)

10. Get enough sleep.
11. Go to the gym.
12. Relax.
13. Listen to music.
14. Go to sleep early.
15. Exercise.
16. Meditate or do yoga.
17. Take time for yourself.

- 18. Eat healthy.
- 19. Spend time outside.

Education Behaviors (ED)

- 20. Read ahead for class.
- 21. Look in the back of the book for the answers before figuring out the problem.
- 22. Do the bare minimum required for tasks.
- 23. Are behind on assignments.
- 24. Are on time in turning in an assignment.
- 25. Are taking above the required amount of classes.
- 26. Study/do homework.

Novelty Activities (NA)

- 27. Have more than 3 different items on your plate at any meal.
- 28. Order the same thing at meal time.

Emotional State (ES)

- 40. Feel stressed.
- 41. Feel anxious.
- 42. Feel happy.
- 43. Feel overwhelmed.
- 44. Feel worried.
- 45. Feel excited.
- 46. Feel depressed.
- 47. Feel tired.

How often does this behavior occur per month?

0 times

1-3 times

4-6 times

7-9 times

10+ times

Risk Behaviors (RB)

- 54. Engage in binge drinking.

55. Participate in drug use.

Escape Activities (EA)

56. Consume alcohol or party to avoid something bothering you.

57. Go out to parties.

Same/Different/New (SD)

58. Hang out with the same group of friends.

59. Hang out with different people.

60. Try new things to eat.

61. Tried something new in general.

62. Prefer the same drinks when you go out.

63. Choose different product brands than normal.

How frequently do you do this?

Often

Occasionally

Sometimes

Never

1

2

3

4

Travel Experience (TE)

64. Visit other schools.

65. Traveled outside of your state.

66. Traveled outside of the country.

67. Visited different countries.

68. Get off campus.

69. Plan or intend to go abroad.

70. Have been abroad.

Schedule Load (SL)

71. Have a busy schedule.

72. Are involved in multiple activities.

73. Are organized.

74. Follow a plan or schedule.
75. Participate in multiple jobs.

Do you agree or disagree with the statements below?

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

Success Activities (SA)

76. I plan on attending graduate school.
77. I maintain a high GPA.
78. I prefer to challenge myself intellectually.
79. I am pursuing either a concentration, minor, or additional major.

Demographic Information

Major: _____

Minor (if applicable): _____

Concentration (if applicable): _____

Overall GPA (as best as you can recall): _____

Age: _____

Gender:

_____ Male

_____ Female

Socio-economic status:

Estimated Household Income:

_____ \$0 - \$25,000

_____ \$25,000 - \$50,000

_____ \$50,000 - \$75,000

- \$75,000 - \$100,000
- \$100,000 - \$150,000
- \$150,000 - \$200,000
- \$200,000 - \$250,000
- \$250,000+

Education:

- I am a freshman in college
 - I am a sophomore in college
 - I am a junior in college
 - I am a senior in college
 - I did not attend college
 - I have had some college
 - I graduated college
 - I have had some graduate level courses
 - I have a graduate level degree
 - I am in high school
- Other: _____

Religious Identification:

- Catholic
 - Jewish
 - Muslim
 - Protestant Christian
 - Evangelical Christian
 - Hindu
 - Buddhist
 - Atheist
 - Agnostic
- Other: _____

Political Affiliation:

- Republican
- Democrat

___ Independent

Other: _____

Political Views:

Conservative 1 2 3 4 5 6 7 Liberal

Ethnicity:

___ White or Caucasian

___ Hispanic or Latino

___ African American

___ Asian

___ Pacific Islander

___ Native American

___ Identify with two or more

Number of siblings: _____

How many states of you traveled to outside your own home: _____

How many different countries have you traveled to outside your home country: _____

How many piercings do you have? _____

How many tattoos do you have? _____