EPISODIC POSITIVE FUTURE-THINKING: ANXIETY, DEPRESSION, AND HOPELESSNESS

A Thesis
by
BRITTANY M. FOSTER

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APPROVED BY:

_____
John Paul Jameson, Ph.D.
Chairperson, Thesis Committee

_____
Lisa Emery, Ph.D.
Member, Thesis Committee

_____
Andrew Smith, Ph.D.
Member, Thesis Committee

_____
Rose Mary Webb
Chairperson, Department of Psychology

_____
Marie Hoepfl, Ed.D.
Interim Dean, Cratis D. Williams School of Graduate Studies

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Abstract

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Brittany M. Foster
B.S., Appalachian State University

Chairperson: John Paul Jameson, Ph.D.

Episodic future-thinking is the ability to project oneself into the future to pre-experience a personal future event. Research suggests that episodic future-thinking may be involved in the cognitive deficits associated with psychopathology such as anxiety, depression, and hopelessness and suicidal thoughts or behaviors. The majority of research has focused on simulation future-thinking as it pertains to psychopathology. However, little attention has been given to the relationship between other types of future-thinking (prediction, planning) and goal setting and psychopathology. Therefore, the purpose of this study was to pilot an electronic episodic future-thinking task that included three types of episodic future-thinking, with aspects of goal setting included, and to examine the predictive 'anxiety, depression, and hopelessness. It was hypothesized that prediction positive future-thinking and beliefs about goals (i.e., likelihood and importance ratings) would be negatively associated with anxiety, but that simulation and planning will have no relationship. It was also hypothesized that all types of future-thinking and beliefs about goals would be negatively related to depression and hopelessness. Surprisingly, the results did not support the hypotheses. The findings and areas for future development and research are discussed.

Keywords: future-thinking, episodic future-thinking, goal setting, planning, anxiety, depression, hopelessness, and suicide

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Episodic Positive Future-Thinking: Anxiety, Depression, and Hopelessness

Anxiety and depression are similar in that both involve distorted cognitions about the future (Miloyan et al., 2014). Research suggests that those with anxiety and depression are likely to have a negative cognitive bias for future events. Specifically, those with depression tend to expect that their futures will generally be negative, and a positive future will be less likely to occur. Those with anxiety tend to believe that negative future events are likely to occur. Researchers studying the nature of future-thinking have also examined the role of these biases in the form of negative and positive future-thinking, especially the cognitive ability to think of these future events. Of particular interest is the research of the effects of anxiety and depression on one's ability to generate positive and negative future events.

The impact on cognitive functioning due to anxiety, depression, and related disorders can be further explained through episodic and semantic future-thinking. Episodic future-thinking is an aspect of future-thinking that involves the ability to project the self into the future to pre-experience a personal future event (Atance & O'Neill, 2001; Schacter et al., 2017). An example of episodic future thinking would be imagining a future dinner with friends. In comparison, semantic future-thinking is knowing script-like future events that are generic to a majority of people, such as ordering food at a restaurant (Schacter et al., 2017; MacLeod & Conway, 2007).

Research on episodic and semantic future-thinking has suggested the increased importance of episodic future-thinking as it relates to psychopathology, specifically anxiety, depression, and suicidality (Atance & O'Neill, 2001). Wu et al. (2015) found that participants with generalized anxiety disorder described future events, especially positive

future events, with less specificity than healthy participants. In addition, Hallford et al. (2020) found that those with major depressive disorder (MDD) produced episodic future events with less specificity, detail and mental imagery.

Episodic future-thinking is also more relevant than semantic future-thinking for those experiencing suicidality. In MacLeod and Conway's (2007) study, parasuicidal patients (i.e., patients who previously attempted suicide without the intent of death) produced fewer episodic positive future thoughts than the control condition. In addition, parasuicidal patients did not significantly differ from controls in identifying pre-generated (semantic) positive future thoughts they believed others would look forward to. So, these patients could identify generic positive future thoughts but had difficulty creating these thoughts for themselves. This demonstrates that episodic future-thinking is related to the suicidal process whereas the role of semantic future-thinking appears to be less relevant. Furthermore, deficits in positive future-thinking appear to be implicated in chronic and serious psychopathology (i.e., depression and suicide) and should be further explored.

Though there appear to be clear links between psychopathology and future thinking, extant research has focused primarily on one type of future thinking known as simulation. However, Szpunar et al. (2014) proposed that there are four different types of episodic future-thinking: simulation, prediction, intention, and planning. Intention and planning are similar in that they are more goal-oriented than event-oriented (i.e., simulation and prediction). Positive future-thinking will be discussed as event-specific future-thinking and goal-specific future-thinking. While these types of future-thinking are assumed to be related, they are fundamentally unique from each other.

Given the relationship of future-thinking with psychopathology, the purpose of this study is to adapt and create tasks that look at different aspects of future-thinking in order to inform later clinical research. Suicide is notorious for being difficult to predict and suicide risk assessments are currently inadequate to predict those who will attempt suicide (Large, 2018). Researchers who study future-thinking (e.g., O'Connor et al., 2008) have found that one's ability to engage in positive future-thinking could be a better predictor for future attempts than hopelessness. Based off of this research, future-thinking is a promising avenue to explore. Looking at how planning for the future and setting and making goals is impacted by anxiety, depression, and hopelessness can also inform intervention for these symptoms and disorders. For example, an adaptation to cognitive behavioral therapy (CBT), which is a treatment for somebody who is experiencing depression, anxiety, or hopelessness, could be the inclusion of assessments and activities for positive future plans and goal setting. Therefore, the potential importance of research for episodic future-thinking and how it relates to psychopathology warrants further study of these additional aspects of this cognitive process. The following section outlines each type of future thinking and their relationships with psychopathology.

Simulation and Prediction Event-Specific Future-Thinking

Simulation

Research using a future-thinking task as it relates to anxiety, depression, hopelessness, and suicide has mainly focused on people's ability to generate positive or negative future events, commonly referred to as simulation future-thinking. Indeed, the ability to generate episodic future thoughts has been found to be related to subjective and psychological well-being (MacLeod & Conway, 2007). The ability to generate future events

is an essential element for episodic simulation. The constructive episodic simulation hypothesis proposes that the purpose of episodic memory is to help people successfully navigate the future through mental constructions (Schacter & Addis, 2007). The construction of future events relies on details from past events which are retrieved from episodic memory. Therefore, tasks that examine the number of personally salient future events a person can create most likely assesses one's ability to access episodic memory.

Research has also demonstrated the relationship of positive future-thinking (PFT) to depression and poor well-being (MacLeod & Conway, 2007). In a study conducted by MacLeod and Salaminiou (2001), they found that the depressed group had fewer positive future events that they were looking forward to and rated their potential pleasure for those events as lower than the control group. Furthermore, research suggests that patients with depression and suicidality are impaired in their ability to imagine positive future events (MacLeod et al., 1993). Specifically, PFT has been found to be inversely related to suicidal ideation (MacLeod & Conway, 2007). In this study, participants who were experiencing suicidal ideation did not generate as many PFTs as the control condition. A study by Conaghan and Davidson (2002) that assessed PFT in older adults with past suicide attempts and depression showed similar results; specifically, participants exhibited a decrease in PFT.

In addition, simulation future-thinking may have the potential to predict suicidal ideation. In one study, intrapersonal PFT, which is synonymous with episodic simulation, was a significant predictor of repeat suicide attempts up to 15 months after the initial suicide attempt (O'Connor et al., 2014). Moreover, research that has examined hopelessness, which is related to both depression and suicide, has found baseline hopelessness to be negatively

correlated with the number of positive future thoughts generated (O'Connor et al., 2008). Importantly, PFT has also been found to have a relationship with hopelessness separate from depression (O'Connor et al., 2000; MacLeod et al., 2005).

The simulation of future events for those with comorbid psychopathology also seem to be impaired. In a study by MacLeod and Byrne (1996), anxious and mixed (anxiety and depression) participants generated fewer future thoughts than the control condition. However, only anxious participants' number of positive future thoughts did not differ from the control group, indicating that anxiety is related to an increase in negative thoughts but an average amount of positive thoughts about the future. MacLeod et al. (1997) found similar results; patients with anxiety produce more negative future-thoughts with little distinction from controls in the production of positive future thoughts.

Prediction

MacLeod and Byrne's (1996) future-thinking task also align with the second type of episodic future-thinking known as prediction. Prediction is the estimation of the likelihood of a specific autobiographical event (Szpunar et al., 2014). MacLeod and Byrne's (1996) future-thinking task ask participants to rate how likely they believe a generated future event will happen, and if it did happen, how positive or negative they would feel as a result. The value and likelihood scales that individuals complete for each future event is congruent with this type of episodic future-thinking (i.e., prediction). Research examining how episodic prediction future-thinking is related to psychopathy has mainly examined the contribution likelihood ratings of generated future events has on the PFT composite score.

MacLeod et al. (2005) examined the individual components of future-thinking, including how the likelihood and value ratings contributed to the relationship between

hopelessness and number of positive and negative future events generated. They found that the average likelihood and value ratings and number of future events generated were independent predictors of hopelessness scores. For PFT, the number of events generated, and the average likelihood ratings were related to hopelessness. In addition, less successful access to positive future events and a belief that those events are less likely to happen is related to the severity of hopelessness (MacLeod & Cropley, 1995). Therefore, it appears that likelihood plays an important role in relation to hopelessness. It is important to note that the sample for this study consisted of suicidal patients. Hence, it would seem that people who are suicidal may exhibit impairment in making predictions about the future due to the presence of hopelessness.

Similar to hopelessness, depression has been found to be related to lower likelihood ratings of positive future events (Andersen et al., 1992). In Hallford et al.'s (2020) study, participants with MDD rated positive future events as less likely to occur and reported less anticipatory pleasure for these events. In addition, MacLeod et al. (1997) found that depressed patients rated positive events as less likely to happen and gave fewer reasons as to why positive future events could happen. In the same study, MacLeod et al. (1997) assessed patients with anxiety and controls who had varying levels of trait anxiety. They found that people with anxiety estimated the likelihood of positive future events as lower than the control condition (i.e., non-clinical trait anxiety).

Goal Setting and Planning Future-Thinking

Studies that examined episodic future-thinking have mainly looked at the fluency that people with anxiety or depression can generate future thoughts. Unfortunately, little research has been conducted on how these individuals, especially those with anxiety, are able to

engage in the other two types of goal-specific episodic future-thinking- goal setting and planning (Szpunar et al., 2014). Given the lack of research for anxiety in these two domains of future-thinking, depression and hopelessness will be the main focus. While intention is a type of future-thinking that is defined as setting a goal for a specific autobiographical event, this study will only be looking at aspects related to goal setting for positive future goals and not the ability to engage in intention future-thinking specifically. Planning is the organization of steps needed to achieve a specific autobiographical future outcome or goal.

Goal Setting

Currently, there is not a specific measure that assesses aspects of setting positive goals such as the likelihood and importance of these personal goals. However, several studies have examined participant's abilities to make goals and make plans to achieve those goals. For example, research that assessed goal setting found hopelessness to be unrelated to the number of goals generated (Hadley & MacLeod, 2010). Instead, low likelihood ratings that those goals could be achieved were related to hopelessness.

In general, research suggests that goal setting and achievement are impaired due to the cognitive deficits associated with depression (Scheurich et al., 2008). The contributing factors to this cognitive impairment appear be due to a lack of motivation, low self-efficacy to complete goals, and a depressed mood. Indeed, research has found that people who are depressed are less likely to believe that they will be successful in completing their goals (Street, 2002). Deficits in cognitive control may also be contributing to a lack of goal-directed behavior for those with depression (Grahek et al., 2019). Cognitive-control is essential for goal-directed behavior because it involves the adaptation of thoughts and behavior in order to achieve a goal. This process involves other cognitive factors such as

task-switching, inhibition, and working memory. Motivation and self-efficacy are important for the enactment of cognitive control and so a lack thereof may explain some of the cognitive deficits seen in depression. In addition, people who have fewer important goals are more vulnerable to depression than those who have several important goals (Champion & Power, 1995). Furthermore, people with depression are likely to have a single important goal that they derive their self-worth from (Street, 2002). As such, they have difficulty disengaging from a failed goal and define this goal as very important to achieve. Ironically, if two important goals are in conflict with each other (e.g., get promoted at work but spend more time with family), one could be more vulnerable to depression (Street, 2002).

Vincent et al. (2004) examined goal setting and achievement in patients who were experiencing suicidality and scored high on hopelessness. They found that these patients did not differ from the controls in the number of positive future goals they could list. However, they rated these goals low on achievability and were less able to think of plans to achieve these goals. In particular, they created fewer specific plans, thought of more obstacles that would prevent them from achieving their goals, and rated their control for achieving their plans as lower than controls. This study demonstrates that hopelessness may be related to a deficit in planning for goal achievement.

Planning

The ability to plan for goal attainment, which has been found to be related to the number of planned steps to achieve a goal, has been linked to greater life satisfaction and positive affect via positive future-thinking (Street, 2002; MacLeod & Conway, 2005). Planning future-thinking is particularly important to examine in depression because depression can impact the achievement of goals or the lack of achievement can lead to

depression (Coote & MacLeod, 2012). Research has demonstrated the former to be valid. Nezlek (2001) found that people with depression make less thorough plans, which often leads to those plans failing. These failed plans further strengthen a depressed person's belief that their plans will fail in the future. Given that research indicates deficits in general goal setting and expectancies for depression and the related lack of research for anxiety, it is necessary to explore whether these deficits are present in planning to achieve positive future goals.

Current Study

Currently, the only episodic future-thinking task developed for clinical use is Hallford et al.'s (2020) Episodic Future Thinking-Test (EFT-T). However, this task was designed to assess the features (e.g., specificity and detail) of generated episodic future events. While this task provides important information on cognitive processes for people with elevated levels of psychopathology, it does not examine the relationship of the types of episodic future-thinking and goal setting to psychopathology. Therefore, this study's aim is to create tasks to assess goal setting and planning future-thinking and to explore how the different types of episodic future-thinking (simulation, prediction, and planning) and aspects of goal setting are related to measures of psychopathology (depression, anxiety, and hopelessness).

Researchers of episodic future-thinking have suggested that the types of future-thinking are not completely independent from each other (Szpunar et al., 2014; Schacter et al., 2008). Rather, it is likely that they build upon each other. For example, Schacter et al. (2008) posited that associating an intention with a specific autobiographical future event could qualify as a type of episodic simulation and it is likely that planning and intention engage some form of simulation. However, prediction is posited to be a separate construct from simulation even though researchers rely on simulation to assess prediction (i.e., FTT).

Cognitive researchers have also treated the different types of episodic future-thinking as separate constructs (e.g., Schacter et al., 2008; Schacter & Addis, 2007; Schacter et al., 2017). Furthermore, because much of the research for topic has been studied in the context of normal psychology rather than clinical, it is necessary to look all the nuances of episodic future-thinking. Therefore, the different types of episodic future-thinking will be treated as individual constructs that interact to a certain degree due to shared cognitive processes. However, based on previous research, a task that assesses one's ability to set goals (i.e., intention future-thinking) is not paramount for clinical purposes. Thus, the rationale is to look at aspects related to goal setting and achievement. And because intention and planning future-thinking have some overlap within each other, this task will provide necessary details for the planning task to be completed. For this study, an episodic positive future-thinking task (EPFT-T) that assess the types of future-thinking as separate, yet related constructs will be created. Specifically, a task that assesses one's ability to simulate and predict positive future events and a task that assesses one's beliefs about personal goals and the ability to make plans to achieve those goals will be piloted.

Though there are not any tasks that directly measure simulation and prediction, MacLeod and Byrne's (1996) future-thinking task (FTT) is conceptually similar. In this task, individuals are asked to think of events that they are looking forward to or not looking forward to over three different time periods. They are then asked to rate the events on likelihood and value scales. While the FTT was designed as a fluency task, the act of creating mental representations of future events aligns with the theory of simulation episodic future-thinking and estimating the likelihood of those events is similar to prediction future-thinking.

This future-thinking task will be adapted to an electronic format to make test administration and scoring more efficient.

The main purpose of the EPFT-T is the creation of a planning episodic positive future-thinking and goal setting task. Planning and goal setting will be combined into one future-thinking task due to the aforementioned overlap of these constructs. This task assesses one's ability to formulate steps to achieve a goal as well as one's beliefs about the importance of their simulated goals and the likelihood of achieving said goals. Research shows that creating a plan through the development of steps in order to achieve a goal increases the chances that one will accomplish that goal (Szpunar et al., 2014). Therefore, in order to not confound goal ratings, the order of the components in the goal setting and planning task are as follows: identifying goals, likelihood of completing goals, importance of goals, and generation of steps to achieve the goals.

The first aim of the study is to examine the various relationships of the variables. I hypothesize that the different types of episodic future-thinking will predict measures of anxiety, depression, and hopelessness. First, I hypothesize that prediction positive future-thinking and goal setting ratings will be negatively and significantly associated with anxiety based off of research that those with anxiety are less likely to believe that they will be successful in completing their goals (Endler & Kocovski, 2000); I predict that simulation and planning will have no relationship. Second, in line with previous simulation and prediction research (e.g., MacLeod et al., 1997), I predict that all types of future-thinking and goal setting ratings will be significantly and negatively related to depression. Similarly, and because of theorized cognitive deficits (Nezlek, 2001; Vincent et al., 2004), for my third

hypothesis, I predict that all types of future-thinking and goal setting ratings will be significantly and negatively related to hopelessness.

Method

Participants

Undergraduate students at Appalachian State University (n = 80; 19 males, 59 females, 2 other) ages 18-25 at Appalachian State University were recruited through the Psychology Department's online research participation system and received class credit for their participation in the study. The majority (95%) of the participants were non-Hispanic/Latino, one (1%) participant was African American, five (6%) participants were Asian, 73 (91%) Caucasian, and two (3%) selected "other." The majority (45%) of the participants completed less than one year of college, 9% completed one year, 21% completed two years, 20% completed 3 years, 3% four years,1% five years, and 1% completed six or more years of college. Participants accessed the study through a link provided via the online research participation system. Inclusion criteria required the participants be 18 to 25-years-old and a current student at Appalachian State University. The reasoning for this age range is because the early twenties is the average age of onset for anxiety and depression (Kessler et al., 2007) and future-thinking may vary widely across the age span. Exclusion criteria will include participants who score two standard deviations below the mean verbal fluency and typing speed scores; upon analysis, two participants fell two standard deviations below the mean and were excluded.

Measures

Simulation and Prediction Future Thinking Task

This task was created to assess one's specific thoughts about the future (MacLeod et al., 1993; MacLeod & Byrne, 1996). For the purpose of this study, the task was converted from its original paper form to an electronic form. For the task, participants were given one minute to type in the provided text boxes potential positive intrapersonal future events or experiences that they were looking forward to across three different time periods: the next seven days, the next 6-12 months, and the next 5-10 years (e.g., "Type in the events that you're looking forward to within the next 7 days"; MacLeod & Byrne, 1996). Participants received one minute per time period for a total of three minutes for this part of the task. After each time period, participants were asked to rate each future event on how likely they thought it would happen (likelihood) and if it did happen, how they would feel at the time (value) on Likert-type scales (MacLeod et al., 1997). The likelihood scale ranges from 0 = *not likely* to 10 = *very likely.* The value rating ranges from -5 = *very negative* to +5 = *very positive* (MacLeod et al., 2005). Previous future-thinking research (e.g., MacLeod et al., 2005) did not find differences for aggregating across time periods, so the episodic simulation future-thinking score was calculated by summing the number of future events the participants generated over the three time periods. The episodic prediction future-thinking score is the average likelihood ratings across the three time periods. This task took approximately 20 minutes. Participants generated an average of 21.39 PFE with the number of events ranging from 9 to 34 across all three time periods. The averaged likelihood rating for these events was 8.47 indicating that participants rated the PFEs they generated as likely to happen.

Goal Setting and Planning Future-Thinking Task

This task asks participants to type in three events or goals that they want to fulfill over three different time periods (next 7 days, 6-12 months, and in 5-10 years). After typing in three goals for one time period, participants are asked to rate how likely or unlikely they are to do the three goals on a 1 (*Unlikely*) to 7 (*Likely*) scale. Participants are asked to rate the importance of each goal on a 1 (*Not Important*) to 7 (*Very Important*) scale. Research has demonstrated that rated importance of concrete goals is necessary in order to determine how devoted one is to the goal (Street, 2002). This is particularly important for those with depression because important goals are more deeply rooted in self-worth. Likelihood and importance scales will be averaged to create a score. Participants are given a maximum of five minutes (with the option to continue when finished after three minutes) to type in the steps that they would take to achieve each goal. This process is repeated for each time period for a total of nine goals. This task took approximately 15 minutes. The average of the likelihood ratings for the goals participants identified was 5.95 with a range of 4.22 to 7.00. This score may indicate that participants generally generated goals that they thought were likely to happen. The average of the importance ratings was 6.35 with scores ranging from 4.48 to 7.00. This suggests that participants rated their future goals as important.

CES-D

The Center for Epidemiological Studies-Depression Scale (CES-D) is a 20-item question measurement that rates the symptoms of depression (Radloff, 1977). The questionnaire asks the individual how often they experience a symptom in a week with a range of *Rarely or none of the time (less than one day)* to *Most or all of the time (5-7 days)*. Items are scored by a point system where the first box receives zero points and the 4th box

receives 3 points. Previous research has found the scale to have high internal consistency (=.85, .90) and acceptable test-retest reliability (r = .54; Eaton et al., 2004). The CES-D has convergent and discriminant validity with Hamilton Clinician's rating and Raskin Rating scale (.44 - .54 and .69 - .75; Radloff, 1977). The scale will include three attention checks that will ask participants to select a certain response (e.g., "Select *Most or all of the time (5-7 days)*"). If two out of the three attention checks are missed, the data was excluded. The score ranges for the CES-D are 0-60 with a score of 16 or more indicating depression. The sample's scores ranged from 0 to 49 with a mean score of 21.13 indicating that on average, the sample may be at risk for clinical depression.

ASI-3

The Anxiety Sensitivity Index-3 (ASI-3) is an 18-item measure that assess an individual's cognitive, social, and bodily reactions to anxiety symptoms (Taylor et al., 2007). The measure asks participants to rate how much they agree with a statement on a 1 (*Very Little*) to 5 (*Very Much*) scale. Anxiety sensitivity aids in the maintenance of anxiety disorders because it measures one's disposition towards fear (Peterson & Heilbronner, 1987). The ASI can predict fearfulness levels better than other anxiety measures and is a reliable measure for personality variables that contribute to anxiety. The ASI-3 has established convergent validity with the ASI for cognitive, social, and physical factors across six samples. The ASI-3 was also able to discriminant patients with anxiety disorders from patients without anxiety disorders (Kemper et al., 2012). ASI has an internal validity of $> .78$ (Peterson & Heilbronner, 1987). The scores for the ASI-3 can range from 0 to 72, with a higher score indicating anxiety sensitivity (Taylor et al., 2007). The sample's scores ranged

from 0 to 72 with a mean score of 27 indicating a range of low and high anxiety sensitivity and an average low anxiety sensitivity.

Hopelessness Scale

The Beck Hopelessness Scale (BHS) is a 20-item question measurement that is designed to capture individuals' (ages 13-80) negative expectancies as they relate to hopelessness in psychopathology (Beck et al., 1974a). The scale asks participants to select "true" or "false" for the 20 statements where nine of the statements are keyed false and 11 are true (Beck et al., 1974b). The statements fall under three different domains: Feelings about the future, loss of motivation, and future expectations. Each optimistic response is coded as a "0" and each pessimistic response is coded as a "1." The sum of these scores is then calculated for a "hopelessness score." The range for scores is 0 to 20. The BHS has an internal consistency of .93. The scale also has established concurrent validity through comparing the scores with clinical ratings of hopelessness and other measures of hopelessness. The BHS has established construct validity because of its inclusion in several studies in which hypotheses were confirmed. The scale will include three attention checks that will ask participants to select a certain response (e.g., "Select *False*"). If two out of the three attention checks are missed, the data will be excluded. This scale took approximately eight minutes to complete. The scores for the BHS can range from 0 to 20 with a score greater than four indicating some degree of hopelessness. The sample's score ranged from 0 to 17 with a mean of 4.79 which suggests a range of no to severe hopelessness and an average level of mild hopelessness.

Typing Fluency

A one-minute typing test was created to assess differences in typing fluency and speed and to control for differences in typing fluency. This task asks participants to type a fourth-grade reading level paragraph that is 303 words long and 1,658 characters. Gross words per minute (WPM) scores are calculated by dividing all typed characters, including spaces and punctuation, by five. This product is then divided by minute(s) allotted (i.e., one).

Controlled Oral Word Association Test

This is a verbal fluency task that tests the number of words participants can generate that begin with three different letters in a limited time span (Benton et al., 1983). Participants will be asked to type as many words as they can that start with each of three letters (F, A, and S). Participants will be given one minute for each letter. Repeated words, pronouns, or different grammatical versions of the words (e.g., tense and plurality) will not be included in the score (Ross et al., 2007). This task should take approximately five minutes.

Positive and Negative Mood Ratings

In line with previous research on future-thinking (O'Connor et al., 2015) and a study that found FT to be malleable to mood induction (O'Connor & Williams, 2014), I controlled for baseline mood. Participants were asked to rate their current positive mood on a 1 (*not positive at all*) to 10 (*extremely positive*) response scale. The negative mood rating scale asks participants to rate their current negative mood on a 1 (*not negative at all*) to 10 (*extremely negative*) scale. To calculate a single mood score, negative mood ratings were inverted and summed with positive mood ratings. The mood score can range from -10 to 10 with a lower number indicating a more negative mood and a higher number indicating a more positive mood. The average mood of participants was 2.76.

Single-Item Self-Esteem Scale (SISE)

A single item that assesses self-esteem by asking participants to rate how true the statement "I have high self-esteem" is on a scale of 1 (*not very true of me*) to 5 (*very true of me*; Robins et al., 2001). The SISE was found to have high convergent validity with the Rosenberg Self-Esteem Scale and a Heise reliability estimate (i.e., test-retest reliability) of .75 in a sample of college students. Currently, there is no known research about the relationships among self-esteem, future-thinking, and psychopathology. However, one study did find that patients who were at risk for major depression reported greater levels of uncertainty about their self-esteem and a lower likelihood of positive future events (Luxton et al., 2006). This may indicate a pessimistic bias for the future. Therefore, in order to further understand these relationships, the SISE was used for exploratory data.

Demographic Questionnaire

This questionnaire asks participants about their age, gender, ethnicity, race, and number of completed years in college. It took approximately two minutes to complete.

Procedure

On the Psychology Department's online participant recruitment page, the study was advertised as a study that is examining "The Development of Episodic Future-Thinking Tasks." The study was described as an online survey that will take one hour to complete. Students received class credit for their participation. The study was administered as an online questionnaire via Qualtrics.

Participants began by taking the Controlled Oral Word Association Test for verbal fluency. Participants were then asked to complete a typing fluency task that assessed how many words per minute they could type. Next, participants were asked to complete the

demographics questionnaire, the SISE, and mood measures. Participants then began the future-thinking task and then completed the goal setting and planning future-thinking task. Lastly, participants were asked to complete the ASI-III, CES-D, and BHS.

The median time to complete the survey was 46 minutes and 90% of the participants completed the survey in less than 81 minutes.

Analysis Plan

To account for missing data, item-mean replacement was employed in cases where less than 50% of the items of a measure were not completed; cases were excluded from analyses where more than 50% of items are missing from any measure. All variables were assessed for univariate outliers and regression models were assessed for multivariate outliers and homoscedasticity. The average time to complete each task was examined in order to determine how time efficient the electronic tasks were. In order to explore the relationships between the future-thinking tasks, self-report measures of self-esteem, depression, hopelessness, and anxiety, a correlation matrix was conducted. All of the hypotheses were tested using three separate simultaneous multiple linear regressions. Each regression contained the same predictors (number of positive future events, averaged likelihood ratings of positive future events, averaged importance and likelihood ratings of goals, and number of steps for goals), but examined different outcomes (i.e., anxiety, depression, or hopelessness). The ASI-3 was used to measure anxiety, the CES-D for depression, and BHS for hopelessness. Because there is lack the lack of research for these tasks with a suggested sample size and due to time restraints, a minimum of 200 participants was needed to examine effect sizes. However, due to concerns about confounded data from history effects due to COVID-19, such as the impact on future-thinking and planning, the optimal number of

participants needed to get adequate statistical power was not met. Thus, due to the lack of power and the nature of the study as a pilot for the tasks, measures of effect size, specifically part correlations, were examined to understand the individual contribution of each predictor.

For the first hypothesis, a regression with number of positive future events, averaged likelihood ratings of positive future events, averaged importance and likelihood ratings of goals, and number of steps for goals as the predictors and ASI-3 scores as the outcome was conducted. The p-value of the regression model was viewed in order to ascertain that simulation (i.e., the number of future events) and planning (i.e., the sum of steps to achieve a goal) future-thinking were not related to anxiety. The standardized beta and part correlation for likelihood ratings for future events and importance and likelihood ratings for goals were examined to determine if they are negatively related to anxiety. For the second hypothesis, I conducted a regression with number of positive future events, averaged likelihood ratings of positive future events, averaged importance and likelihood ratings of goals, and number of steps for goals as the predictors and CES-D scores as the outcome. The standardized beta and part correlations for all of the predictors were examined to determine if simulation, prediction, and planning future-thinking and goal setting are negatively related to depression. To test the third hypothesis, I conducted a regression with number of positive future events, averaged likelihood ratings of positive future events, averaged importance and likelihood ratings of goals, and number of steps for goals as the predictors and BHS scores as the outcome. The standardized beta and part correlations for all of the predictors were examined to determine if simulation, prediction, and planning future-thinking and goal setting are negatively related to hopelessness. To control for mood, mood ratings were entered into each regression model as a covariate.

Results

As may be seen in Table 1, number of and likelihood ratings for PFEs, steps for goals, and importance and likelihood ratings for goals were not related to the ASI-3. The likelihood ratings for both PFEs and goals had a weak and moderate negative correlation, respectively, to the CES-D. The number of PFEs and steps for goals and importance ratings for goals were not related to the CES-D. In addition to being related to the CES-D, the likelihood ratings for PFEs and goals had moderate negative correlations to BHS. Importance rating for goals was also weakly and negatively correlated to the BHS. In contrast, the number of PFEs and steps for goals was not associated with the BHS. Mood was moderately and negatively correlated to the BHS and the CES-D and was weakly and negatively correlated to the ASI-3. Mood also had a weak positive correlation to the PFE and goal likelihood ratings.

The first hypothesis was partially supported; The first half of the hypothesis (i.e., measures of prediction and goal setting would significantly predict the ASI-3) was not supported while the second half (i.e., measures of simulation and planning would not be related to the ASI) was supported. To test whether measures of prediction and goal setting are negatively related to a measure of anxiety and that measures simulation and planning future-thinking are not related to anxiety, a simultaneous multiple linear regression was conducted while controlling for positive and negative mood ratings. A significant regression equation, $F(6, 69) = 2.21, p = .052, R2 = .16$, was not found for the measures of prediction or goal-setting (importance and likelihood ratings for goals). Mood was a significant predictor of ASI-3 ratings ($\beta = -.37, t = -2.94, p = .004$). Likelihood ratings of PFEs were not a significant predictor of ASI-3 scores ($\beta = -.04, t = -.26, p = .80$).

Importance ($\beta = -.06$, t= –.41, p = .68) and goal likelihood ($\beta = .01, t = .07, p = .94$) ratings were not significant predictors of ASI-3 scores. Standardized beta was in the expected direction for the importance ratings and the part correlation was found to be r_{part} = –.05. As was hypothesized, the number of PFEs ($\beta = -.05, t = -.44, p = .66$) and the number of steps for goals ($\beta = .04$, $t = .37$, $p = .71$) was not a significant predictor of ASI-3 scores.

The second hypothesis that the measures of future-thinking and goal setting would predict CES-D scores was not supported after mood was controlled for. To test whether all types of future-thinking and beliefs about goals will be significantly and negatively related to depression, a linear regression model was conducted while controlling for positive and negative mood. While a significant regression was found, $F(6, 69) = 7.31$, $p < .001$, $R^2 = .39$, the hypothesis that the measures of future-thinking and goals beliefs would predict CES-D scores was not supported after mood was controlled for. Mood was a significant predictor of CES-D scores ($\beta = -.48, t = -4.52, p < .001$). For simulation future-thinking, the number of PFEs was not a significant predictor of CES-D scores (β = .08, t = .82, p = .42). For prediction future-thinking, the average likelihood for PFEs was not a significant predictor of CES-D scores (β = –.11, t = –.84, p = .41) but standardized beta was in the expected direction. The number of steps generated for goals (i.e., planning future-thinking) was not a significant predictor of CES-D scores (β = .00, t = .05, p = .96). Measures of goal beliefs, average likelihood ratings (β = –.17, t = –1.29, p = .20) and importance ratings ($\beta = .03$, $t = .22$, $p = .82$) were not significant predictors of CES-D scores. However, standardized beta for the average likelihood ratings for goals was in the expected direction and the part correlation was found to be r_{part} = –.15.

The third hypothesis that all types of future-thinking and beliefs about goals would be significantly and negatively related to hopelessness was not supported. A linear regression was conducted with mood being controlled. Similar to the regression model for depression, this model was significant, $F(6, 69) = 6.35$, $p < .001$, $R^2 = .36$, but the hypothesis was not supported once mood was controlled for. Mood was also a significant predictor for BHS scores ($\beta = -.35, t = -3.19, p = .002$). For simulation future-thinking, the number of PFEs was not a significant predictor of BHS scores ($\beta = .08, t = .73, p = .47$). For prediction future-thinking, the average likelihood for PFEs was not a significant predictor of BHS scores ($\beta = -.17, t = -1.29, p = .20$) but standardized beta was in the expected direction and the part correlation was found to be $r_{part} = -.13$. The number of steps generated for goals (i.e., planning future-thinking) was not a significant predictor of BHS scores ($\beta = -.13, t = -1.36, p = .18$) but standardized beta was also was in the expected direction and the part correlation was $r_{part} = -.13$. Measures of goal beliefs, average likelihood ratings ($\beta = -.20, t = -1.50, p = .14$) and importance ratings ($\beta = -.07, t = -.53, p = .60$), were not significant predictors of BHS scores. The average likelihood ratings for goals were in the expected direction with a part correlation of $r_{part} = -.15$.

Discussion

This was a pilot study to investigate the predictive relationship of individual episodic future-thinking and novel goal-setting tasks for measures of psychopathology. Surprisingly, the hypotheses in this study were not supported. There does not appear to be an additive benefit of studying the discrete aspects of episodic future-thinking. In addition, mood may have a more prominent influence on future-thinking than was suspected.

While research is sparse on the relationship between future-thinking and anxiety, it was an unexpected finding that none of the measures of PFT were related to the measure of anxiety. This finding may be due to the anxiety sensitivity measure used (i.e., ASI-3), which measures a fear of physiological sensations related to anxiety. Because this study is mainly focused on cognitive processes, the ASI-3 may not be a helpful measure of anxiety in this particular context due its focus on the somatic symptoms of anxiety. Another explanation may be that PFT is not related to anxiety. Rather, future-thinking research suggests that anxiety is related to negative future thinking (NFT) instead of PFT (e.g., MacLeod, 1999).

Considering that there is research that NFT may be a more promising avenue to explore for anxiety, future-thinking research has consistently found PFT to be related to depression. However, in this pilot study, none of the measures of PFT were related to measures of depression or hopelessness after controlling for mood. The findings indicated that mood was a better predictor of depression and hopelessness than measures of future-thinking. The influence of mood, while greater than predicted, was not unexpected given that depression and hopelessness are mood disorders, and research has also found that future-thinking could be affected by mood (e.g., O'Connor et al., 2015; O'Connor & Williams, 2014).

Moreover, positive future-thinking specifically has been found to be susceptible to mood induction. Hepburn et al. (2006) conducted a study that examined the effects of mood induction on the number of positive future events generated. The results showed that participants who were induced to feel negatively generated fewer positive events. Interestingly, participants who were induced to feel positive did not generate more positive future events. Therefore, it seems that a negative mood can influence how many PFEs are

generated. These results are congruent with PFT research suggesting that those with depression, hopelessness, and suicidality produce fewer PFEs (e.g., Hunter & O'Connor, 2003). With these findings from research, mood was controlled for in the statistical analysis. Although it was unexpected that mood was the only significant predictor, these disorders are often characterized by a negative mood, so perhaps present mood is the best predictor, above measures of future-thinking, of depression and hopelessness.

In addition to exploring the possibility of mood as a superior predictor, it may be useful to consider the presence of comorbid anxiety and depression symptoms as a confound to the data. As can be seen in Table 2, the average scores for the sample reflected low anxiety sensitivity and risk of clinical depression. While these scores do not indicate a clinical diagnosis of anxiety or depression, data from participants experiencing both anxiety and depression symptoms is difficult to accurately interpret and determine effects purely related to depression or anxiety and future-thinking measures. Future-thinking researchers have also considered high rates of comorbid depression and anxiety as a potential confound. Within 12 months, 41.6% of those with major depression report also having one or more anxiety disorder (Kalin, 2020). Given the moderate correlation between our measures of depression and anxiety, the same appears to be true in the current study. MacLeod and Byrne (1996) encountered this difficulty when trying to recruit college students with anxiety and depression. Because participants with depression only were difficult to locate, a mixed group (anxiety and depression) and an anxiety group were created as a result. Because the mixed group consisted of individuals with both depression and anxiety, relationships between depression and future-thinking independent of anxiety were difficult to make. The presence

of comorbid anxiety and depression in the current population sample may have similarly confounded the current study's results for the relationships of future-thinking and psychopathology.

Besides the consideration for the sample used for the study, another explanation for the results may be that the future-thinking measures themselves are not valid measures of future-thinking as it relates to psychopathology. Future-thinking is an intricate process that relies on several cognitive processes and coordination between several brain regions related to memory (e.g., hippocampus) and emotion (e.g., thalamus and orbitofrontal cortex). Historically, there have been disputes about the process of future-thinking. Notably, Kahneman and Tversky (1982) proposed that people estimate the likelihood of a future events happening based on two mental processes- the retrieval of past events and the construction of scenarios when the event is novel or unique. They coined the former mental process the availability heuristic and the latter mental process the simulation heuristic; these were described as separate mechanisms. This distinction of the different types of future-thinking based on the different mental processes utilized set the stage for the development of alternative theories. One alternative theory views future-thinking as a more globalized and active process. Taylor and Schneider (1989) proposed simulation as dynamic general cognitive process that allowed people to plan for future events, interpret past events, adjust emotions, and provide connections between thought and action. Given this example of differences among researchers, it is difficult to know exactly which mental processes people are engaging in while completing these tasks. Thus, the validity of the pilot tasks used for this study and what it is assessing is debatable. In order to ascertain the validity of these tasks', further development and consideration of these theories is needed. For example,

Taylor and Schneider's (1989) theory suggests that there may be little research utility in examining the separate aspects of episodic future-thinking. It might be more beneficial to study episodic future-thinking as cognitively integrative process that engages all four different processes (i.e., simulation, prediction, planning, and intention) as a whole or as combinations (e.g., simulation and prediction) depending on the future thought. For example, a future thought about eating a meal may utilize fewer cognitive resources than a future thought about getting groceries. A thought about eating a future meal may not use certain types of future-thinking whereas getting groceries could possibly use all types of future-thinking.

Limitations

A major limitation was the small sample size and the composition of the sample. The sample was a Western, educated, industrialized, rich, and democratic (WEIRD) population which effects the external validity of the results make it less generalizable to other races, ethnicities, marginalized groups, cultures, etc. (Henrich et al., 2010). For example, there is neuroimaging research suggests that different ethnicities may vary in their cognitive processes and that a WEIRD sample is not an accurate depiction of average human psychological functioning (Henrich et al., 2010). Given that future-thinking is cognitive research, it is necessary to consider this limitation. In addition, the majority of the sample were White young female college students, which further reduces the generalizability to other gender identities and age ranges. Future research would need to increase the variability of the sample to be more inclusive and balanced.

Another limitation was the measures used to assess for depression and anxiety. The CES-D and ASI-3 were used as screening tests that measured symptoms of anxiety and

depression. A clinically significant score on the ASI-3 and CES-D does not indicate a diagnosis of anxiety or depression. Therefore, the reliance on the ASI-3 and CES-D rather than a clinical sample limits the clinical applicability of the results. In addition to ASI-3 and CES-D, the BHS, SISE, mood rating, likelihood and value ratings were online self-report measures. Self-report measures could be subject to response biases such as "faking good."

Given that the study was conducted online due to COVID-19, other sources of error such as differences in environment, test-taker confusion, nonadherence to task instruction, test-taker differences (e.g., technological comfort), may affect the validity of the study. Furthermore, tasks such as the oral word association and simulation future-thinking are not validated for online administration. The novel tasks that assessed planning future-thinking and aspects of goal setting were also not intended to be administered online and were adapted to accommodate this administration (e.g., increased time limits to complete the tasks). It is unknown whether typing future events or steps for goals differs from writing or verbalizing the same events or goals or if these differences could affect the validity of the study. Nonetheless, future research is needed to explore how future-thinking and its related cognitive processes are engaged by these different forms of communication.

Future Directions

In order to explore the influence of mood, one logical next step could be to examine whether the relationship between future-thinking and depression, hopelessness, and anxiety is mediated by mood; specifically, mood as a mediator for the relationships between anxiety and measures of future-thinking, depression and future-thinking, and hopelessness and future-thinking. Other future-thinking researchers have found attitudes that are biased by mood (i.e., optimism) to be a mediator of future-thinking. Ji and colleagues (2021) explored

participants' tendency to generate positive instead of negative images of the future during spontaneous future-thinking. They found that optimism, which can be a product of positive mood, mediated the relationship between positive and negative tendencies and reductions in negative mood. Specifically, the tendency to think of more positive than negative future images was related to an increase in how optimistic one feels, which in turn was related to a reduction of negative mood. Thus, as it is related to thinking about the future, mood can be an influencer. However, no research to date has explored the relationship among mood, future-thinking, depression, hopelessness, and anxiety. Further exploration of mood as a mediator between disorders characterized by negative mood and future-thinking could reveal the next steps of future-thinking research.

In addition to exploring mood as a mediator, another future direction could be to explore different avenues for the measures of future-thinking such as planning. For example, this study's non-significant finding could be because the mode for measuring planning future-thinking, frequency of steps, does not have a linear relationship with depression or hopelessness. While the ability to plan for goal attainment has been found to be related to the number of planned steps, Nezlek (2001) found that those with depression may struggle with creating thorough plans. Based off of this research, it appears that the quality of the plan and its feasibility is more related to depression than the number of steps for a plan. The lack of significant results for this study suggests that there is not a direct relationship between number of steps and depression and hopelessness. However, a future longitudinal study that examines the quantity of steps and fulfilling goals at a later date (i.e., goal attainment) may yield different results.

While consideration for alternative methods to measure planning future-thinking could provide validity to future-thinking research, differences in future-thinking processing styles could be an interesting direction to research. Recent research has examined how the way that people recall autobiographical (i.e., episodic) memories can have different affective impacts. For example, in a study by Nelis and colleagues (2015), participants who recalled autobiographical positive life events with an imagery-based processing style that focuses on sights and sounds, in comparison to a verbal-based processing style that focuses on verbal thinking about the meaning or consequences of an event, had greater increases in positive affect. Therefore, a future direction may be to group participants based on their processing styles in order to control for changes in affect or to develop a future-thinking task that focuses on one type of processing style.

Lastly, a future direction for episodic future-thinking could be to explore how simulation future-thinking is related to emotion regulation. An example could be determining whether deficits in the simulation of positive future events are related to poorer emotional processing. The amygdala and rostral Anterior Cingulate Cortex (rACC) are integral structures for emotional memory and emotion modulation in the limbic system (Sharot et al., 2007; Schacter & Addis, 2007). Studies that have examined the simulation of future events using neuroimaging suggest that the imagining of positive future events is involved in emotional processing via simultaneous activation of the amygdala and rACC (Schacter & Addis, 2007). In addition, Schacter and Addis (2007) found that more optimistic individuals had less connectivity between these two limbic structures when thinking about future negative events and greater connectivity when thinking about positive future events. This

greater activation may suggest an optimistic bias that is could be related to improved emotional processing. For those with an optimism bias, the reduced connectivity among areas of emotional processing act as a buffer against experiencing a negative emotional state when thinking about negative future events. Furthermore, imagining positive outcomes for future events is related to increases in optimism and decreases in worry about a future event. Conversely, people with depression have been found to have decreased rACC volume and a hypermetabolism that impairs their ability to have the optimism bias (Drevets, 2000). Importantly, this hypermetabolism has also been found in nondepressed sample who underwent negative mood induction (Drevets, 2000). This suggests that rACC hyperactivity is mood dependent. Antidepressant treatment has been known to reduce this hyperactivity, which can then permit patients to have the optimism bias to act as a buffer against negative emotions from negative events. In conclusion, future research for how optimism, mood, and future-thinking are related is needed to understand how these constructs relate to psychopathology and relevant treatments or interventions.

Conclusion

This was a pilot study that examined the relationship among newly developed electronic EPFT-T tasks and measures of anxiety, depression, and hopelessness. The majority of future-thinking research has focused on simulation and prediction future-thinking with little attention given to intention future-thinking and goal setting as it pertains to psychopathology. Given the difficulties that those experiencing anxiety, depression, and hopelessness may have with thinking about or planning for the future, these tasks were created. Despite having limitations, this pilot study has several possible implications for future-thinking research and areas for growth. Further development of the future-thinking

task is needed with additional consideration for the cognitive processes being assessed. The lack of support for the hypotheses suggest that it may be beneficial to think of future-thinking as a whole rather than individual constructs. Furthermore, mood may have a greater influence on future-thinking than previously thought. Research into this avenue may help to inform the development of clinical interventions for those with mood disorders or suicidality. However, more research and development of the EPFT-T is needed before it can become applicable to clinical research.

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Table 1. Scale Correlations

Measure	1	2	3	4	5	6	7	8
1. ASI-3								
2. CES-D	.65**							
3. BHS	.35**	.71**						
4. Goal Steps	.08	.08	-.03					
5. #PFEs	-.05	.02	-.04	.09				
6. PFE Like.	-.17	-.37**	-.46**	-.06	.19			
7. Goals Like.	-.21	-.40**	-.46**	-.07	.21	.62**		
8. Goals Imp.	-.15	-.16	-.28*	-.04	.29*	.55**	.47**	
9. Mood	-.38**	-.60**	-.50**	-.15	-.03	.35**	.42**	.15

Note. Anxiety Sensitivity Index (ASI-3); Center for Epidemiologic Depression Scale (CES-D); Beck Hopeless Scale (BHS); Number of positive future events (#PFEs); Positive future event likelihood ratings (PFE Like.); Goals likelihood ratings (Goals Like.); Goals importance ratings (Goals Imp.)

*. Correlation is significant at the 0.05 level.

**. Correlation is significant at the 0.01 level.

Table 2. Descriptive Statistics

Measure	Min	Max	Mean	SD
ASI-3	0	72.00	26.93	16.19
CES-D	0	49.00	21.13	12.17
BHS	0	17.00	4.76	4.07
Mood	-7.00	9.00	2.76	3.39

Appendix A: Research Consent

Consent to Participate in Research

Information to Consider About this Research

Title of Study: *Development of an Electronic Future-Thinking Task*

Principal Investigator: Brittany Foster
Department: Psychology
Faculty Supervisor: JP Jameson, Associate Professor, Department of Psychology
Contact Information:
(828) 262-8950
jamesonjp@appstate.edu

You are being invited to take part in a research study that is developing tasks that measure different aspects of episodic future-thinking. If you take part in this study, you will be one of about 130 people to do so. By doing this study we hope to learn about the different types of episodic future-thinking and how they are related to measures of mood.

You will be asked to participate in one one-hour online study. For the study, you will be asked to complete a series of surveys with questions about yourself and your mood, an oral word association test, a typing fluency task, and the future-thinking tasks. For one future-thinking task, you will be asked about future events and to rate how likely each event is to happen and if it did happen how you would feel. For the other task you will be asked about your goals and how you would go about achieving those goals. All of the tasks will be completed electronically.

You cannot volunteer for this study if are under 18 years of age.

What are possible harms or discomforts that I might experience during the research?

To the best of our knowledge, the risk of harm for participating in this research study is no more than you would experience in everyday life.

What are the possible benefits of this research?

There may be no personal benefit from your participation, but the information gained by doing this research may help inform future-thinking research and help in the development of efficient future-thinking tasks which could be easier to disseminate across different professional fields.

Will I be paid for taking part in the research?

You will not be paid for your participation in this study. However, you can earn up to 2 ELCS for your participation. There are other research options and non-research options for obtaining extra credit or ELCs. One non-research option to receive 1 ELC is to read an article and write a 1-2 page paper summarizing the article and your reaction to the article. More

information about this option can be found at: psych.appstate.edu/research. You may also wish to consult your professor to see if other non-research options are available.

How will you keep my private information confidential?

Responses and data collected will be anonymous. All data storage meets the "Standard Security" recommendations from the IT security office. Anonymous electronic data will be stored indefinitely.

Who can I contact if I have questions?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Faculty Advisor, Dr. JP Jameson, at 828-262-8950 or jamesonjp@appstate.edu. If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2692, through email at irb@appstate.edu or at Appalachian State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

Do I have to participate? What else should I know?

Your participation in this research is completely voluntary. If you choose not to volunteer, there will be no penalty and you will not lose any benefits or rights you would normally have. If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. There will be no penalty and no loss of benefits or rights if you decide at any time to stop participating in the study. If you decide to participate in this study, let the research personnel know.

By continuing to the next page, I agree that I have read and understand the above information about the research study. I know I can stop at any time and email the researchers with any questions. I want to be in the research study.

Appendix B: Survey

Episodic Future-Thinking Study

You are being asked to participate in one 1.5 hour online study. For the study, you will be asked to complete a series of surveys with questions about yourself and your mood, an oral word association test, a typing fluency task, and the future-thinking tasks. For one future-thinking task, you will be asked about future events and to rate how likely each event is to happen and if it did happen how you would feel. For the other task you will be asked about your goals and how you would go about achieving those goals. All of the tasks will be completed electronically.

Q175 **Consent to Participate in Research**
Information to Consider About this Research

Title of Study: ***Development of an Electronic Future-Thinking Task***

Principal Investigator: Brittany Foster
Department: Psychology
Faculty Supervisor: JP Jameson, Associate Professor, Department of Psychology
Contact Information:
(828) 262-8950
jamesonjp@appstate.edu

You are being invited to take part in a research study that is developing tasks that measure different aspects of episodic future-thinking. If you take part in this study, you will be one of about 200 people to do so. By doing this study we hope to learn about the different types of episodic future-thinking and how they are related to measures of mood.

You will be asked to participate in one one-hour online study. For the study, you will be asked to complete a series of surveys with questions about yourself and your mood, an oral word association test, a typing fluency task, and the future-thinking tasks. For one future-thinking task, you will be asked about future events and to rate how likely each event is to happen and if it did happen how you would feel. For the other task you will be asked about your goals and how you would go about achieving those goals. All of the tasks will be completed electronically.

You cannot volunteer for this study if are under 18 years of age.

What are possible harms or discomforts that I might experience during the research?

To the best of our knowledge, the risk of harm for participating in this research study is no more than you would experience in everyday life.

What are the possible benefits of this research?

There may be no personal benefit from your participation, but the information gained by doing this research may help inform future-thinking research and help in the development of efficient future-thinking tasks which could be easier to disseminate across different professional fields.

Will I be paid for taking part in the research?

You will not be paid for your participation in this study. However, you can earn up to 2 ELCS for your participation. There are other research options and non-research options for obtaining extra credit or ELCs. One non-research option to receive 1 ELC is to read an article and write a 1-2 page paper summarizing the article and your reaction to the article. More information about this option can be found at: psych.appstate.edu/research. You may also wish to consult your professor to see if other non-research options are available.

How will you keep my private information confidential?

Responses and data collected will be anonymous. All data storage meets the "Standard Security" recommendations from the IT security office. Anonymous electronic data will be stored indefinitely.

Who can I contact if I have questions?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Faculty Advisor, Dr. JP Jameson, at 828-262-8950 or jamesonjp@appstate.edu. If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2692, through email at irb@appstate.edu or at Appalachian State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

Do I have to participate? What else should I know?

Your participation in this research is completely voluntary. If you choose not to volunteer, there will be no penalty and you will not lose any benefits or rights you would normally have. If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. There will be no penalty and no loss of benefits or rights if you decide at any time to stop participating in the study. If you decide to participate in this study, let the research personnel know.

By continuing to the next page, I agree that I have read and understand the above information about the research study. I know I can stop at any time and email the researchers with any questions. I want to be in the research study.

Page Break

Please try to complete this study in a single sitting. Several of the tasks are timed so read the directions carefully before beginning a task. If you need to take a break, please do so in between tasks and not during.

Start of Block: Word Association instructions

For this task, you will be asked to complete a word association activity. I want to see how many words you can type that begin with a letter that is given to you. You may type any word at all except proper nouns such as names of people or places. Also, do not use the same word again with a different ending, such as run and running. Do not type numbers as well. If you cannot think of any words keep on trying until the time limit is up. You will have **60 seconds** for each letter given to you. After the time limit is up, you will be taken to the next letter. Begin typing immediately. When you are ready to begin the task click the arrow.

Page Break

End of Block: Word Association instructions

Page Break

The first letter is... F
Type in words in that begin with the letter "F"

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

- 21 _____
- 22 _____
- 23 _____
- 24 _____
- 25 _____
- 26 _____
- 27 _____
- 28 _____
- 29 _____
- 30 _____

Page Break

Page Break

The second letter is...A
Type in words in that begin with the letter "A"

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

- 21 _____
- 22 _____
- 23 _____
- 24 _____
- 25 _____
- 26 _____
- 27 _____
- 28 _____
- 29 _____
- 30 _____

Page Break

Page Break

The third letter is… S
Type in words in that begin with the letter "S"

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

- 21 _____
- 22 _____
- 23 _____
- 24 _____
- 25 _____
- 26 _____
- 27 _____
- 28 _____
- 29 _____
- 30 _____

Page Break

Start of Block: Typing Fluency Task

Timing
First Click
Last Click
Page Submit
Click Count

For this task you will be asked to complete a typing fluency activity to assess how many words per minute you can type. Once you click on the arrow you will automatically begin the task and the timer will start. Begin typing the given paragraph as quickly and accurately as you can. You will have **one minute**. After one minute, you will automatically be forwarded to the next part of the study. When you are ready to begin the typing task, click the arrow.

Page Break

There are almost 400 different kinds of sharks. Each kind of shark looks different, has a unique diet, and behaves differently. There are sharks in the four oceans of the world. Some sharks are longer than a school bus, while others are so small they can live in fish tanks. Sharks come in all kinds of colors. Most of the time, their skin color helps them blend in with their surroundings. But, some sharks that live in the deepest part of the ocean actually have parts that glow in the dark. Most sharks live in salt water, but some can live in fresh water. Sharks are actually a type of fish. There are some similarities as well as differences between sharks and typical fish. Shark skeletons are made of cartilage. Fish skeletons are made of bones. Cartilage is the bendy, tough substance in people's ears and noses. Like other fish, sharks have gills that help them breathe. Unlike fish, people use lungs to get oxygen from the air. Fish get oxygen from the water using their gills. Water needs to move over the gills so the sharks can get enough oxygen. To keep the water moving, most sharks need to be swimming in water that has a very strong current. Sharks have a lot of teeth. Sharks have many rows of teeth, rather than just one row like people. The teeth from the outside row gradually fall out. Then teeth from the next row take their place. Some sharks will lose 30,000 teeth in a lifetime! Each species of shark has different kinds of teeth and they eat various kinds of food. Some sharks eat food as small as plankton. Other sharks eat animals as big as sea turtles. Most sharks do not eat very often. Some sharks will go weeks between meals.

_____

_____

_____

_____

_____

Page Break

End of Block: Typing Fluency Task

Start of Block: Demographics

Now I am going to ask you some questions about yourself.

Page Break

Please enter your age

_____

What is your gender?

- ○ Male
- ○ Female
- ○ Other
- ○ Prefer not to answer

Please select your ethnicity.

- ○ Hispanic or Latino
- ○ Non-Hispanic or Latino

What do you consider your race to be? Check all that apply.

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other

Please select the current number of college years you have completed.

- ○ Less than 1
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6+

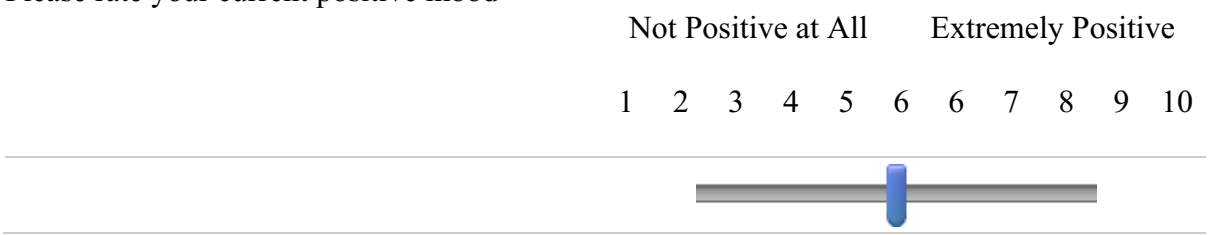
End of Block: Demographics

Start of Block: SISE and Mood

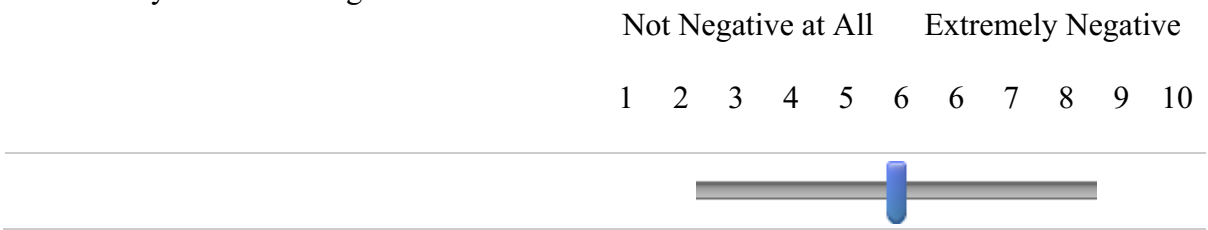
Please rate how true this statement is for you: I have high self-esteem.

Not very true of me Very true of me

Please rate your current positive mood



Please rate your current negative mood



End of Block: SISE and Mood

Start of Block: PFT Intro

Now I am going to ask you to type in events in boxes that you are looking forward to over three different time periods. You can press tab to move to the next box or you can click the box. You will have **one minute** per time period to enter in your responses. Please work until the time limit is up or when you cannot think of anymore events. When your time is up you will be directed to questions about the events you entered. After answering these questions, you will be directed to instructions for the next time period. After you have read those instructions click the arrow to go to the next time period. The timer will begin automatically as soon as you click the arrow.

Page Break

End of Block: PFT Intro

Start of Block: PFT (One week)

Type in the events that you're looking forward to (things that you enjoy) within the next 7 days (including today. Work as quickly as you can until the time limit is up. You will have a **one minute** to type in your responses. Click the arrow to begin.

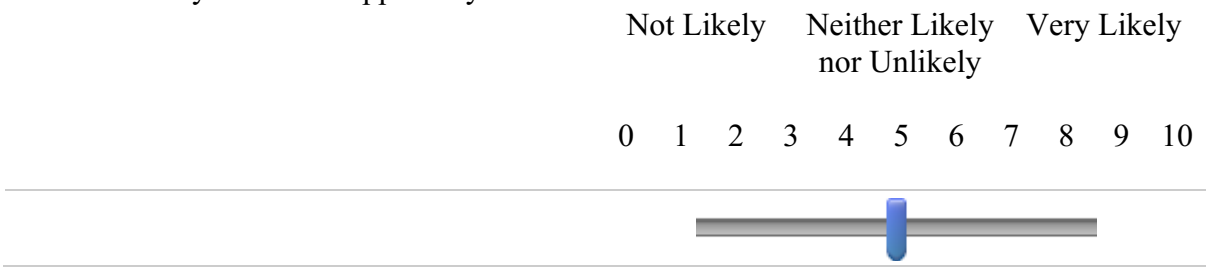
Page Break

Type in the events that you're looking forward to (things that you enjoy) within the next 7 days (including today)

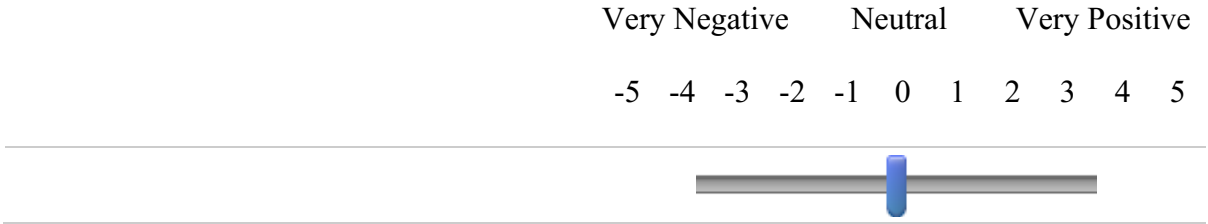
- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

For future event: ${Q34/ChoiceTextEntryValue/1}

Rate how likely this is to happen to you

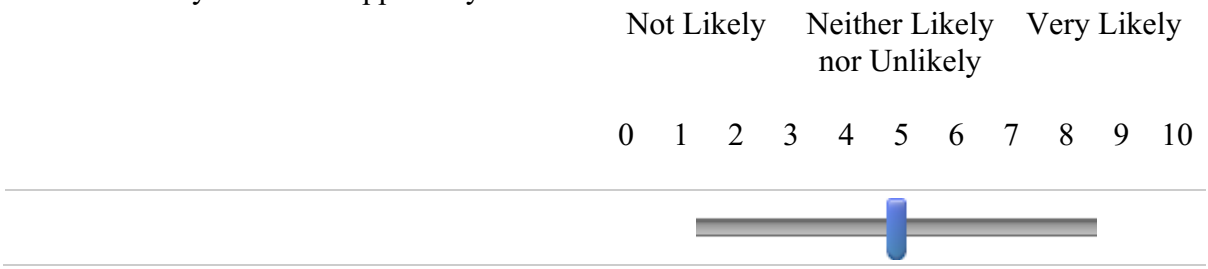


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/2}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/3}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

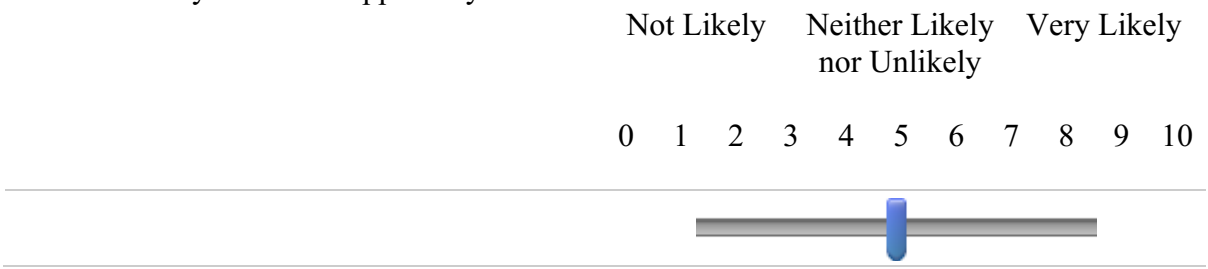
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

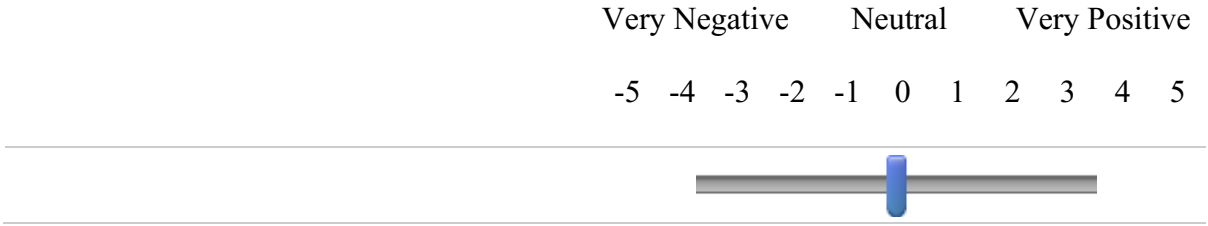
Page Break

For future event: ${Q34/ChoiceTextEntryValue/4}

Rate how likely this is to happen to you

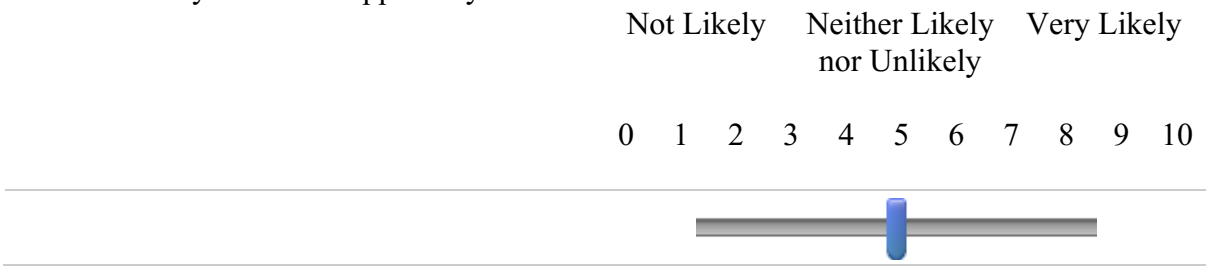


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/5}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/6}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

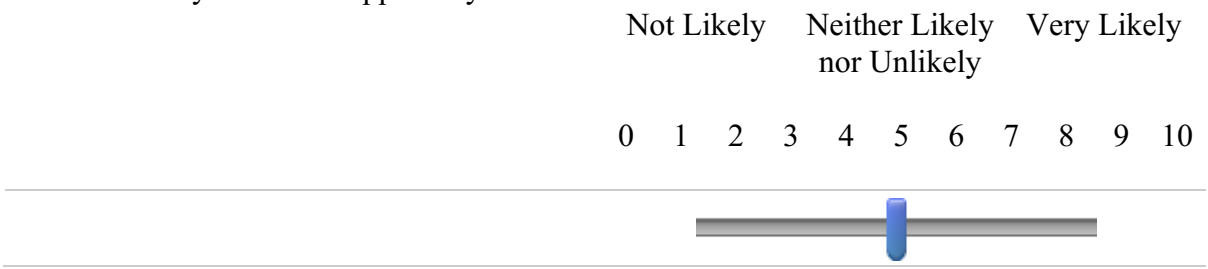
Not Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

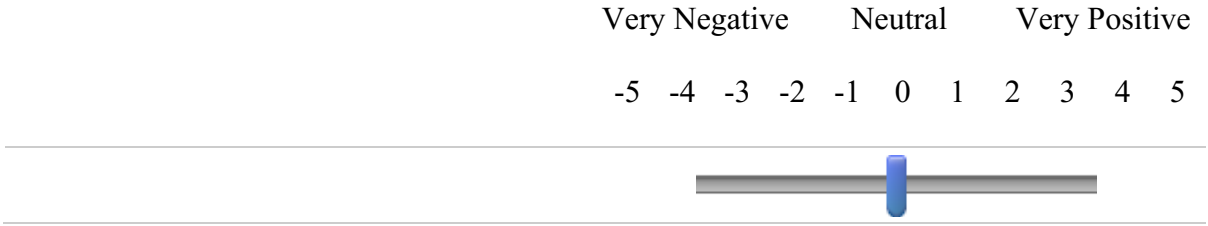
Page Break

For future event: ${Q34/ChoiceTextEntryValue/7}

Rate how likely this is to happen to you

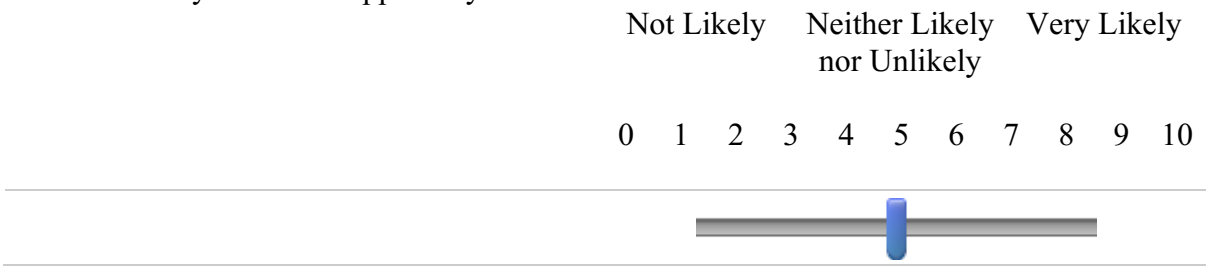


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/8}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/9}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

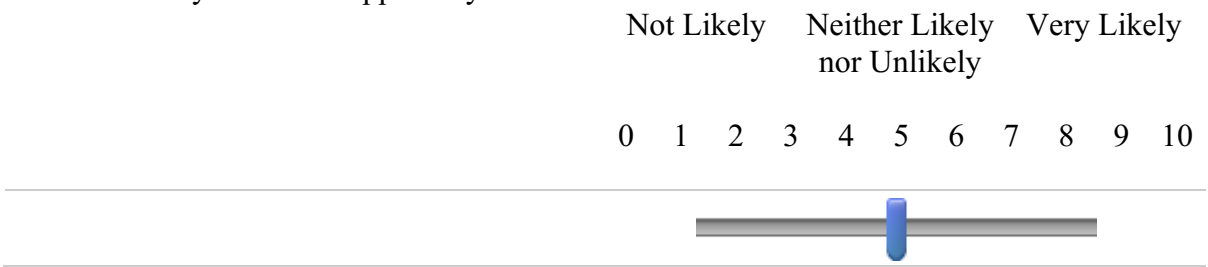
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

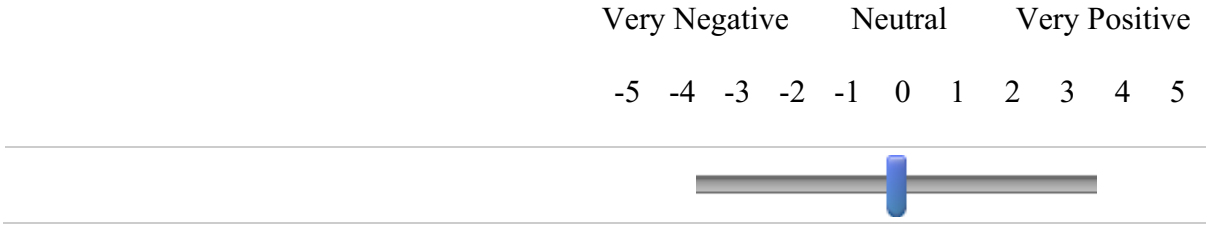
Page Break

For future event: ${Q34/ChoiceTextEntryValue/10}

Rate how likely this is to happen to you

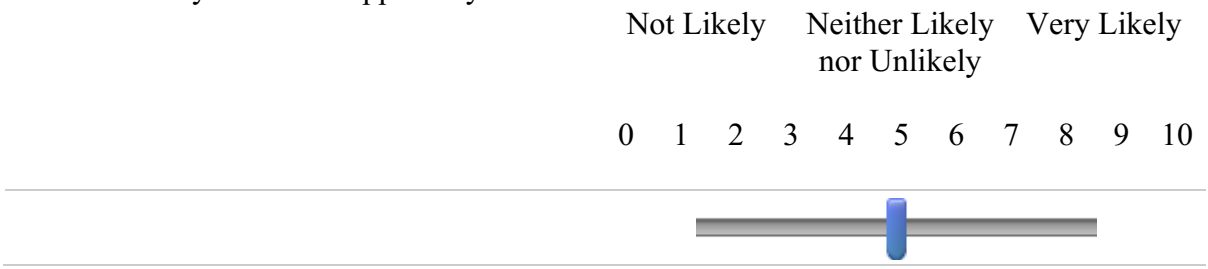


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/11}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/12}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

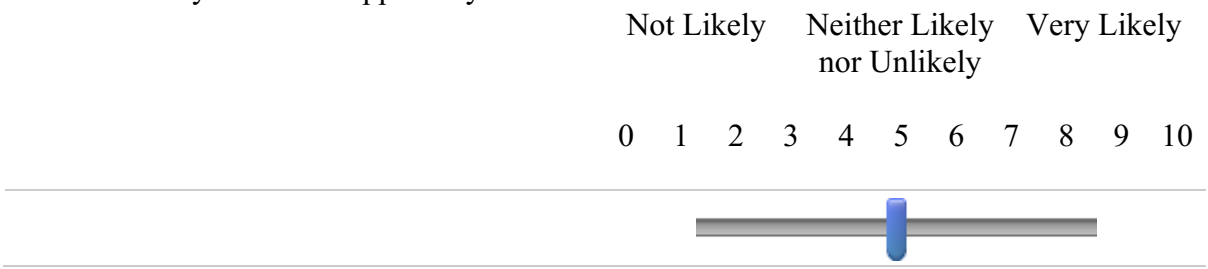
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

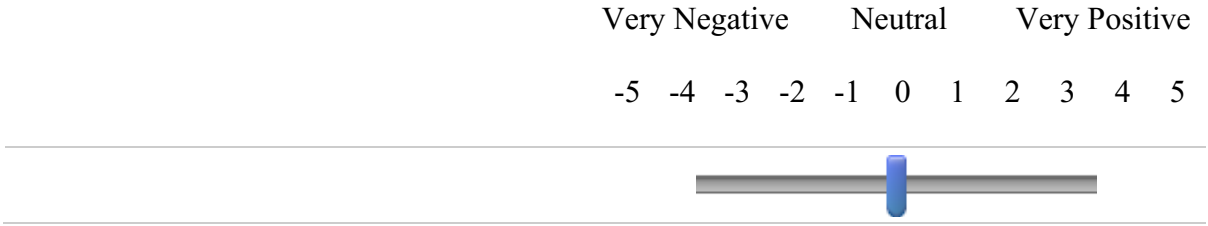
Page Break

For future: ${Q34/ChoiceTextEntryValue/13}

Rate how likely this is to happen to you

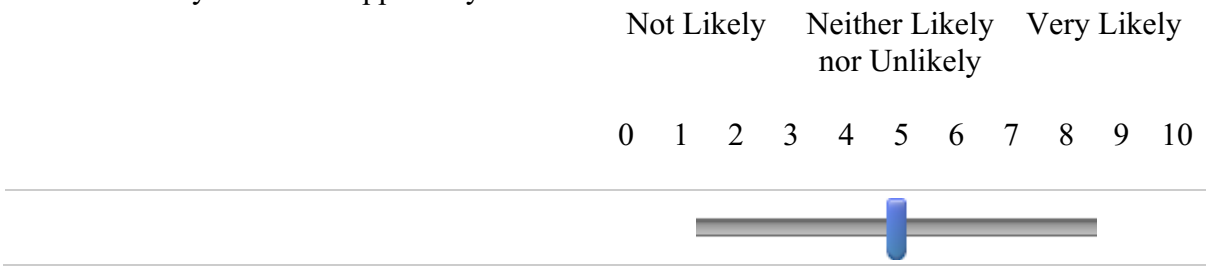


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/14}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/15}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

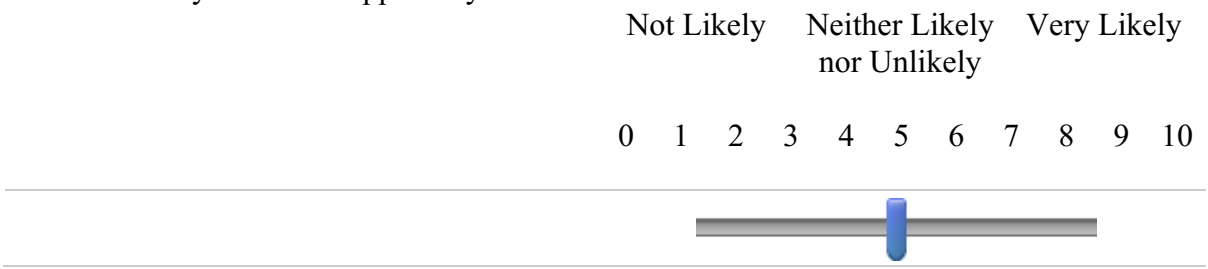
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

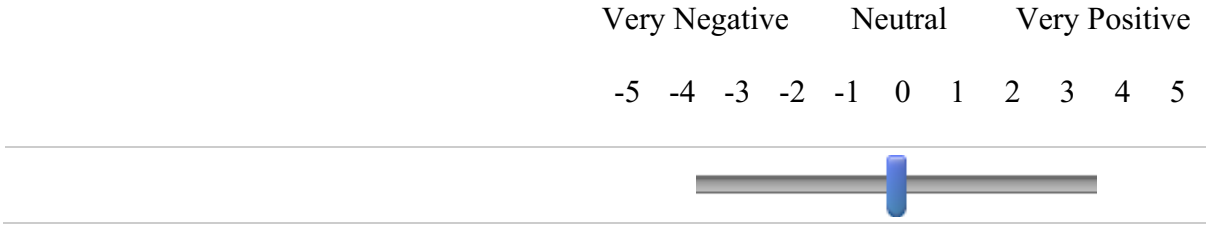
Page Break

For future event: ${Q34/ChoiceTextEntryValue/16}

Rate how likely this is to happen to you

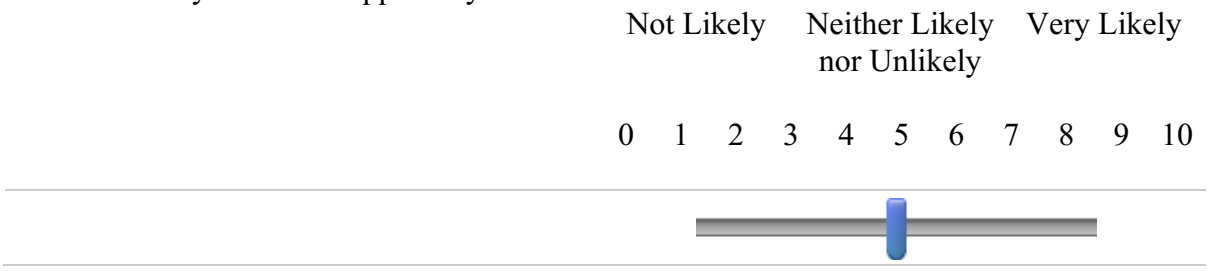


If this event did happen, how would you feel at that time?



For future event: ${Q34/ChoiceTextEntryValue/17}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q34/ChoiceTextEntryValue/18}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

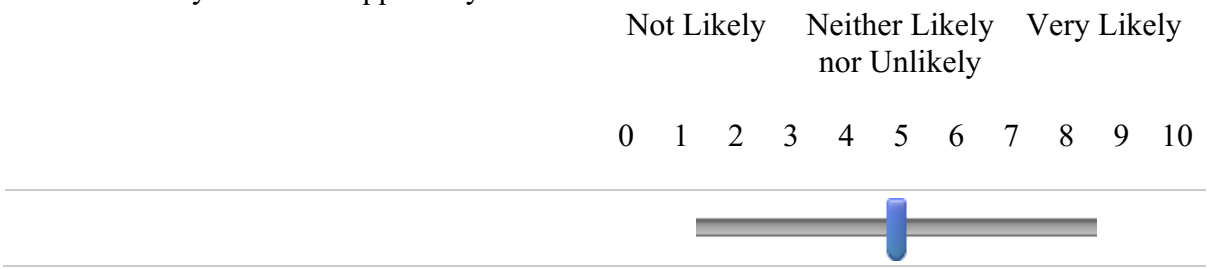
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

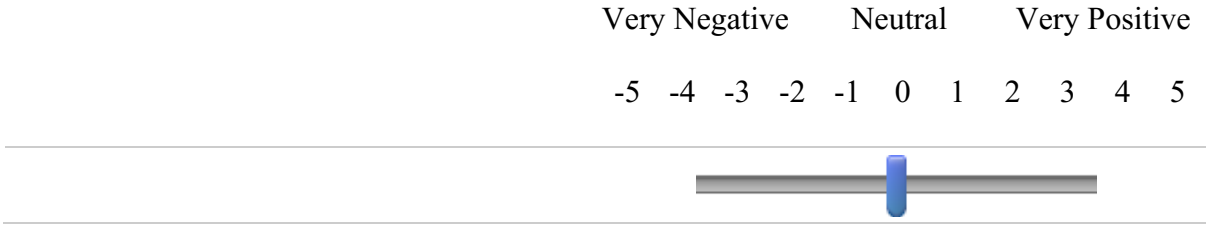
Page Break

For future event: ${Q34/ChoiceTextEntryValue/19}

Rate how likely this is to happen to you

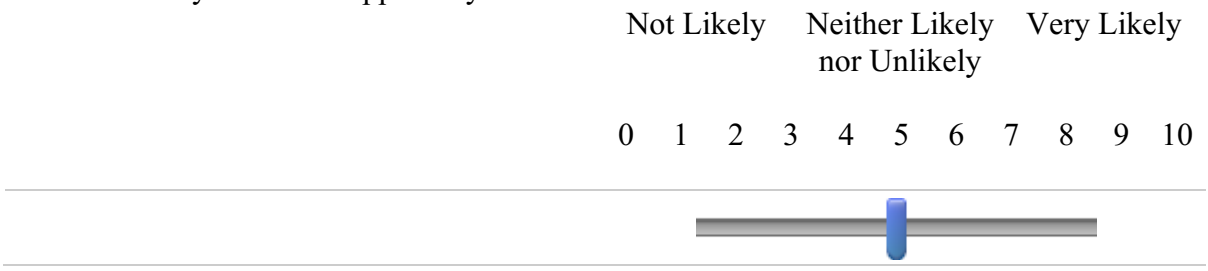


If this event did happen, how would you feel at that time?

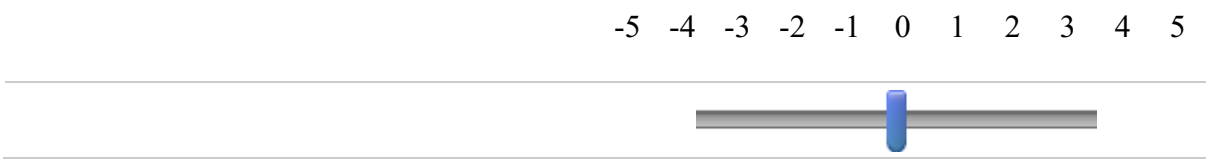


For future event: ${Q34/ChoiceTextEntryValue/20}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?



End of Block: PFT (One week)

Start of Block: PFT (One year)

Now type in the events that you're looking forward to (things that you enjoy) within the next 6-12 months. Work as quickly as you can until the time limit is up. You will have a **one minute** to type in your responses. Click the arrow to begin.

Page Break

Timing
First Click
Last Click
Page Submit
Click Count

Type in the events that you're looking forward to (things that you enjoy) next year

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

Page Break

End of Block: PFT (One year)

Start of Block: Likelihood and value PFT (One year)

For future event: ${Q31/ChoiceTextEntryValue/1}

Rate how likely this is to happen to you

Not Likely | Neither Likely nor Unlikely | Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

Very Negative | Neutral | Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/2}

Rate how likely this is to happen to you

Not Likely | Neither Likely nor Unlikely | Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/3}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

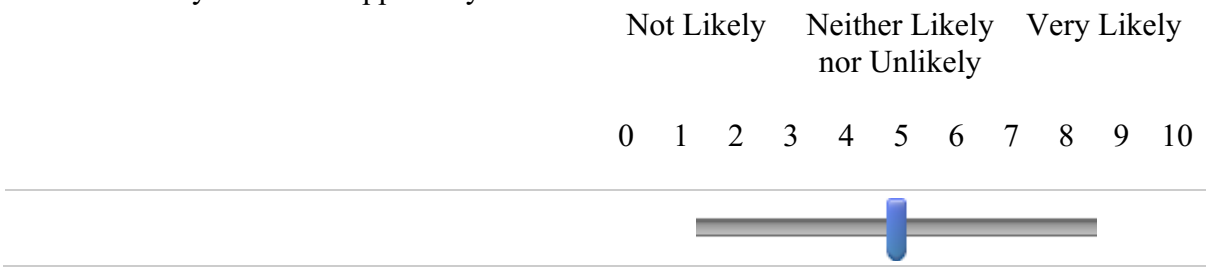
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

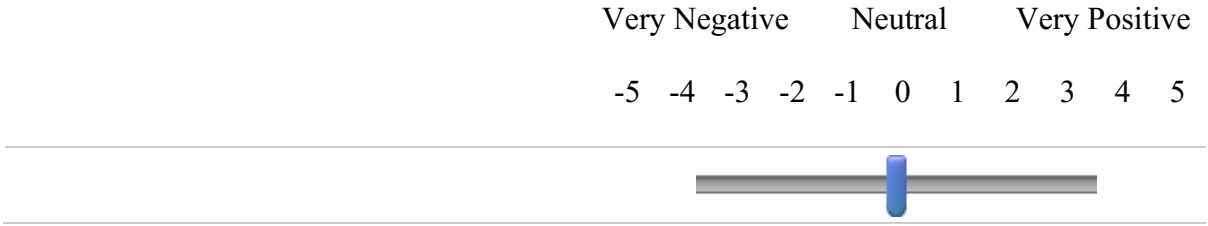
Page Break

For future event: ${Q31/ChoiceTextEntryValue/4}

Rate how likely this is to happen to you

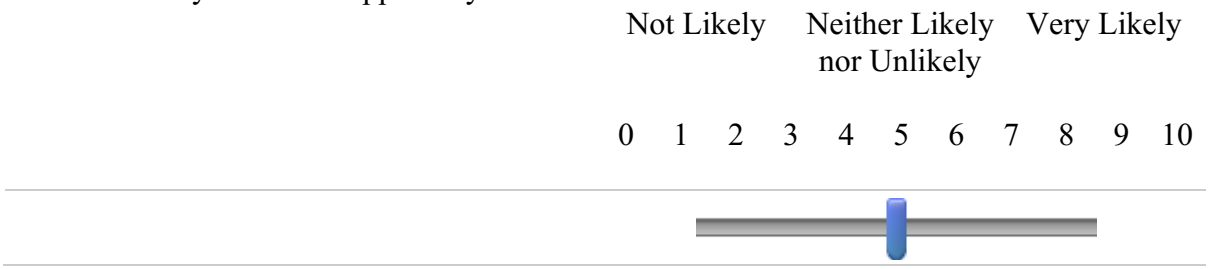


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/5}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/6}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

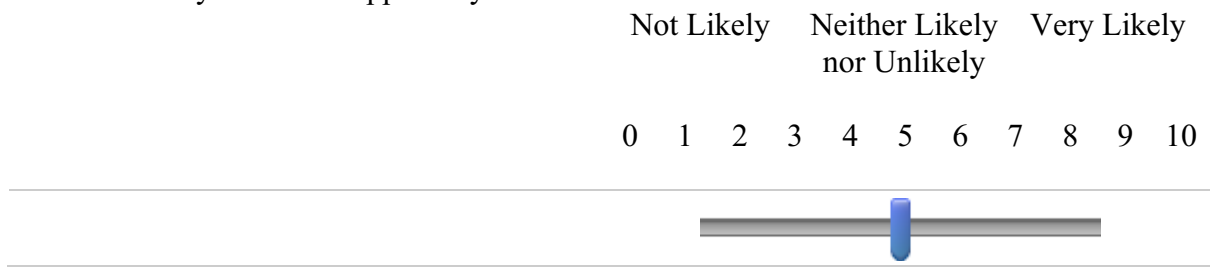
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

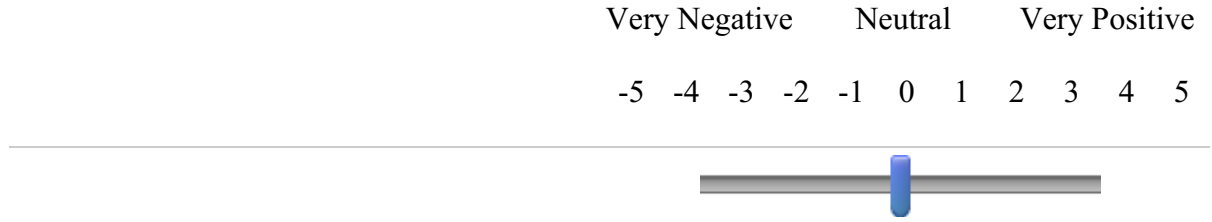
Page Break

For future event: ${Q31/ChoiceTextEntryValue/7}

Rate how likely this is to happen to you

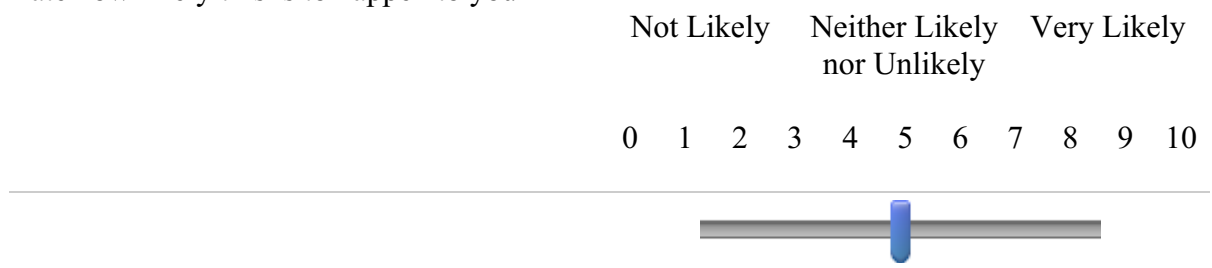


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/8}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/9}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

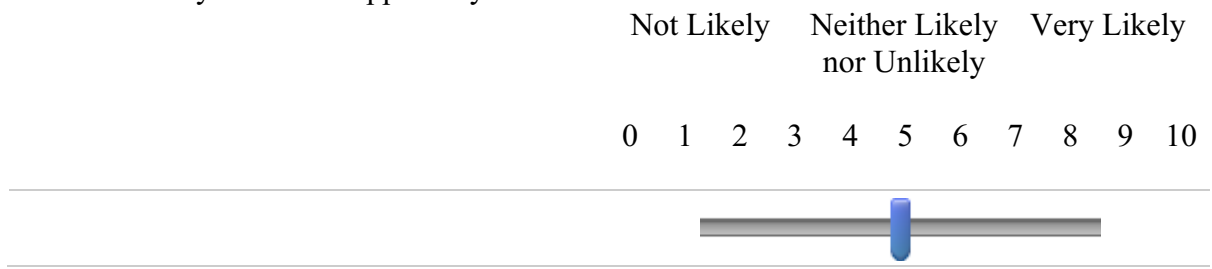
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

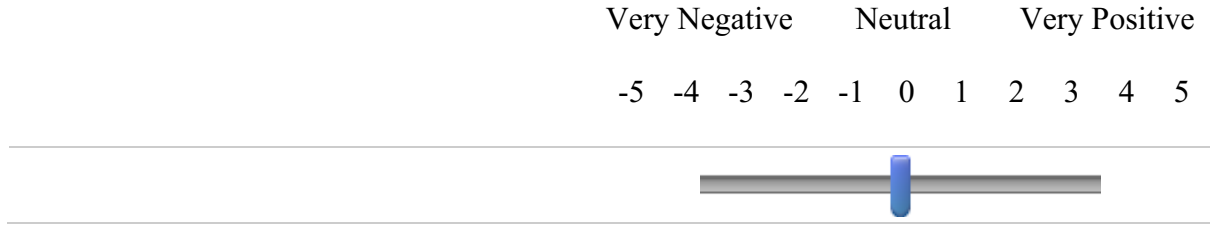
Page Break

For future event: ${Q31/ChoiceTextEntryValue/10}

Rate how likely this is to happen to you

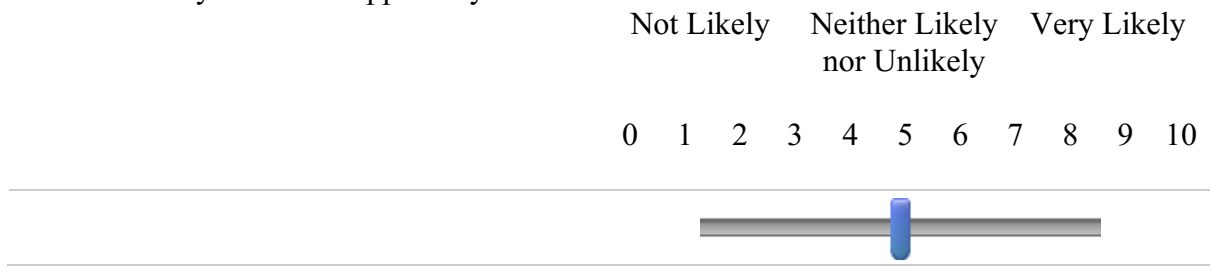


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/11}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/12}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

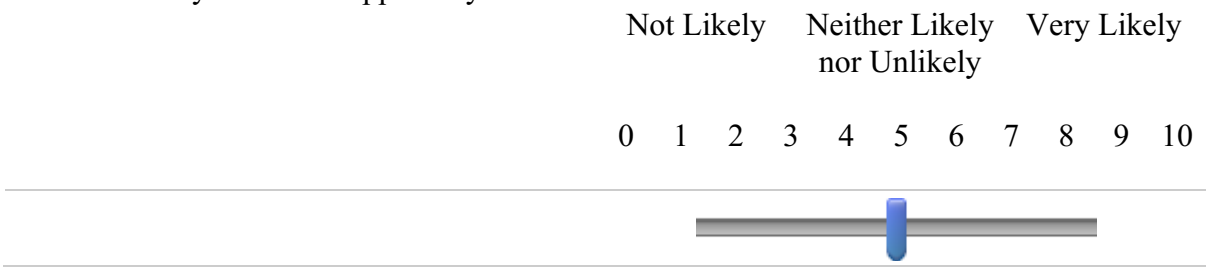
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

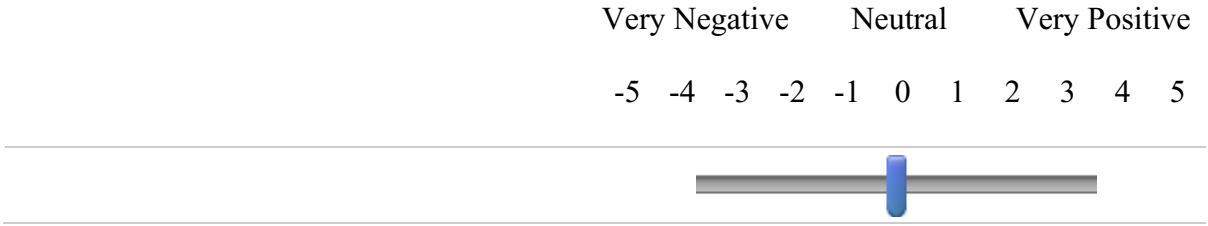
Page Break

For future event: ${Q31/ChoiceTextEntryValue/13}

Rate how likely this is to happen to you

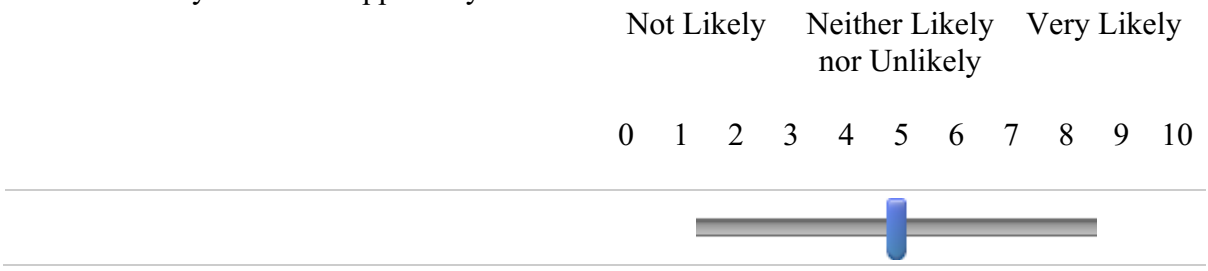


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/14}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/15}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

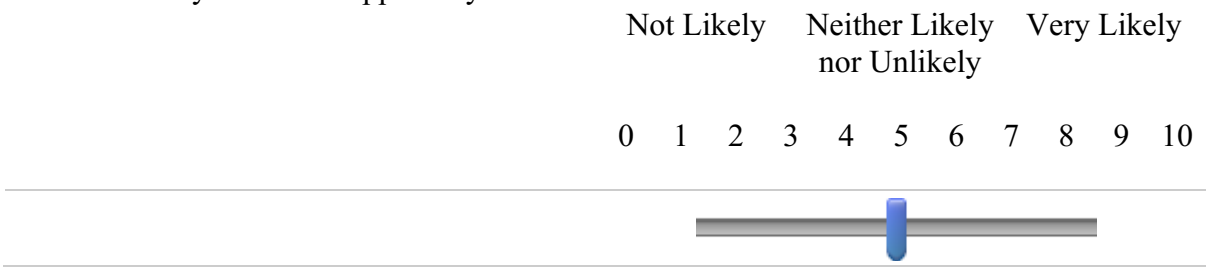
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

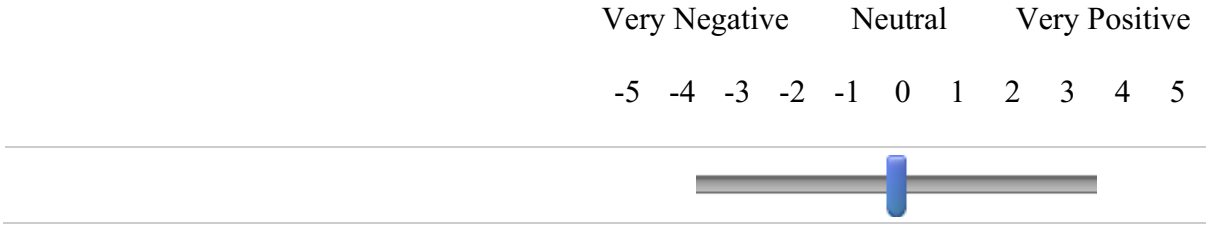
Page Break

For future event: ${Q31/ChoiceTextEntryValue/16}

Rate how likely this is to happen to you

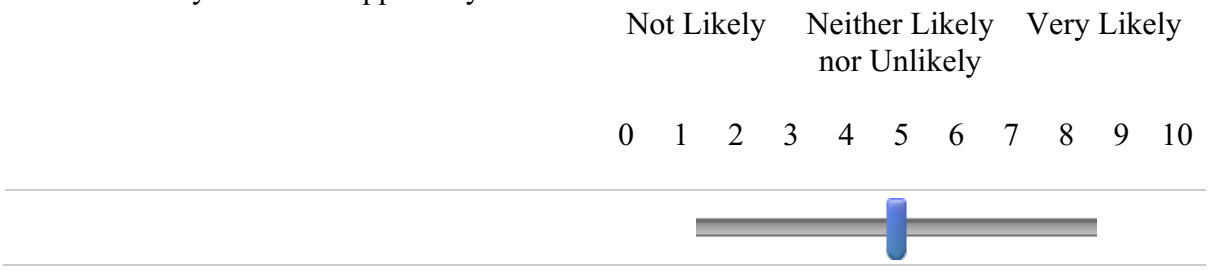


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/17}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q31/ChoiceTextEntryValue/18}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

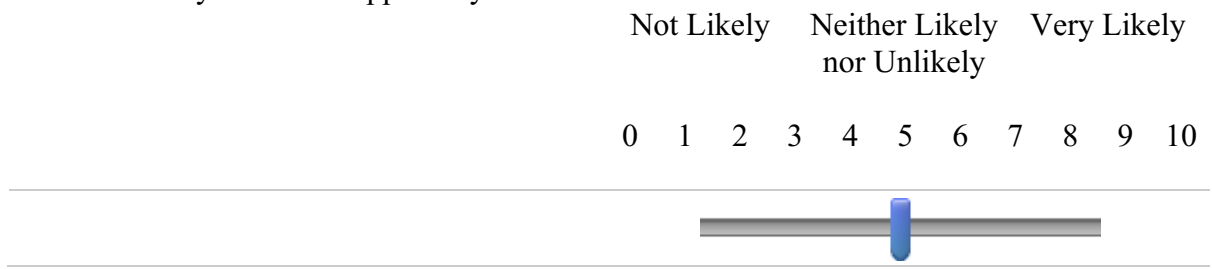
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

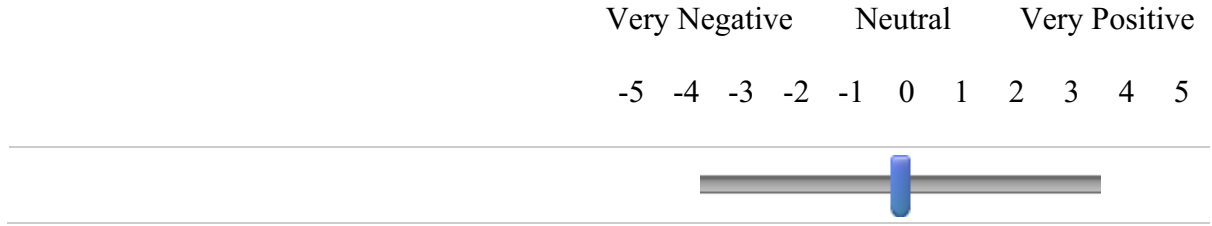
Page Break

For future event: ${Q31/ChoiceTextEntryValue/19}

Rate how likely this is to happen to you

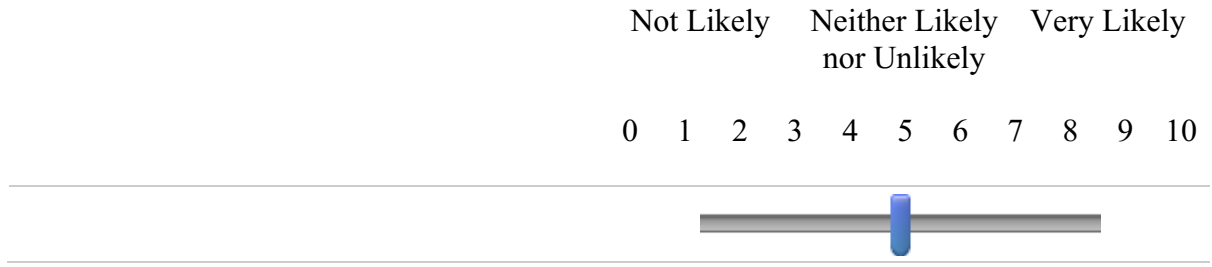


If this event did happen, how would you feel at that time?



For future event: ${Q31/ChoiceTextEntryValue/20}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

End of Block: Likelihood and value PFT (One year)

Start of Block: PFT 5-10 years

Now I am going to ask you to type in events that you are looking forward to in the next 5-10 years. Work as quickly as you can until the time limit is up. You will have a **one minute** to type in your responses. Click the arrow to begin.

Page Break

Timing
First Click
Last Click
Page Submit
Click Count

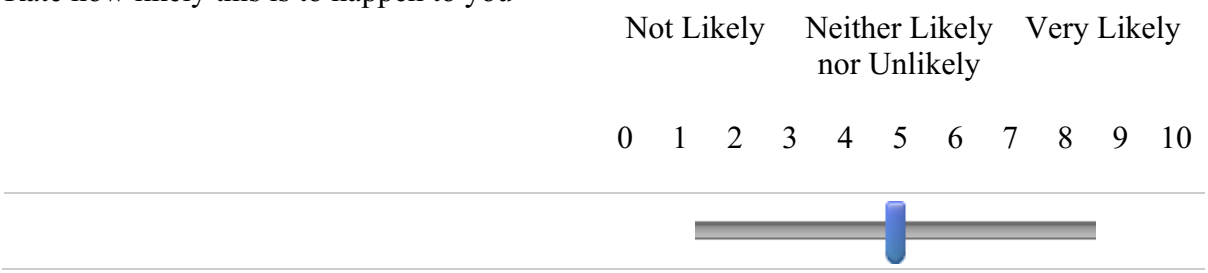
Type in the events that you're looking forward to (things that you enjoy) within the next 5-10 years.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

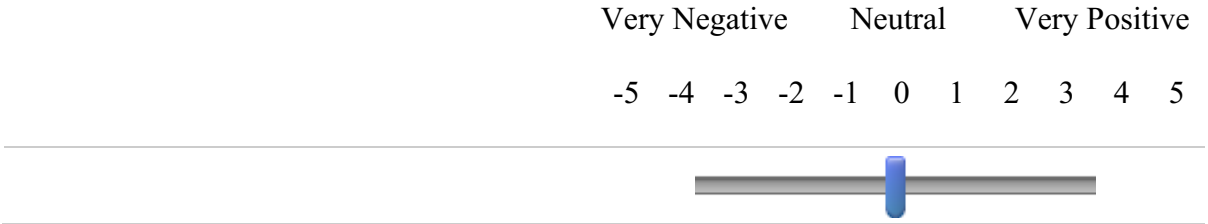
Page Break

For future event: ${Q117/ChoiceTextEntryValue/1}

Rate how likely this is to happen to you

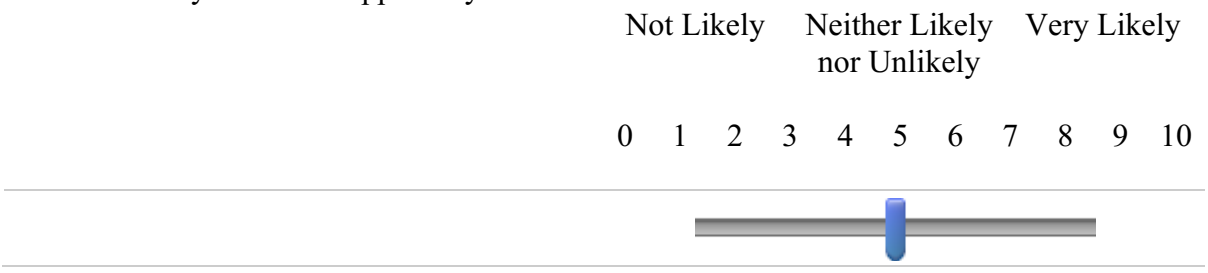


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/2}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/3}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

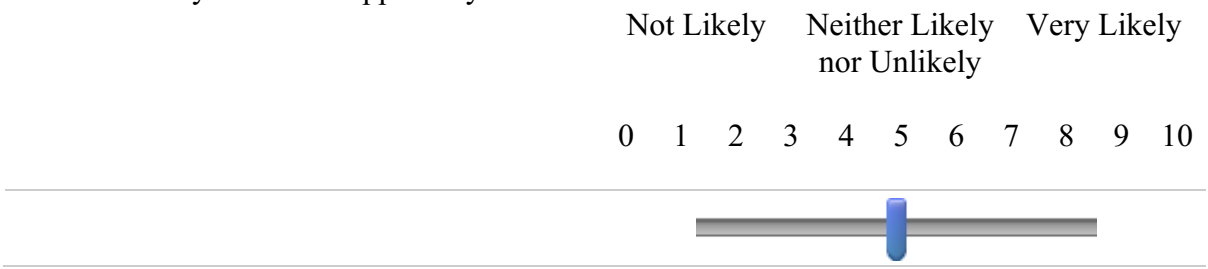
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

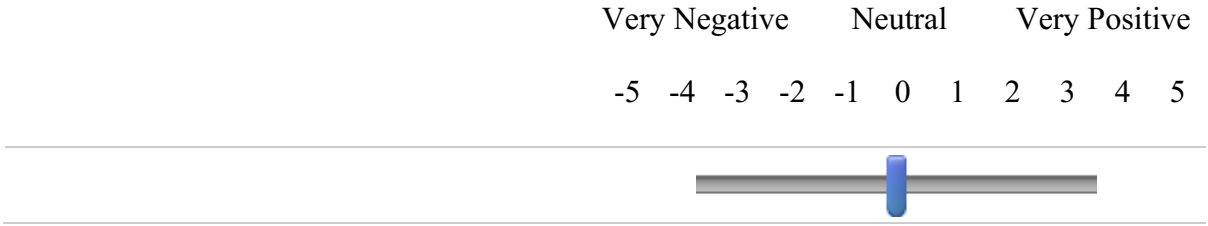
Page Break

For future event: ${Q117/ChoiceTextEntryValue/4}

Rate how likely this is to happen to you

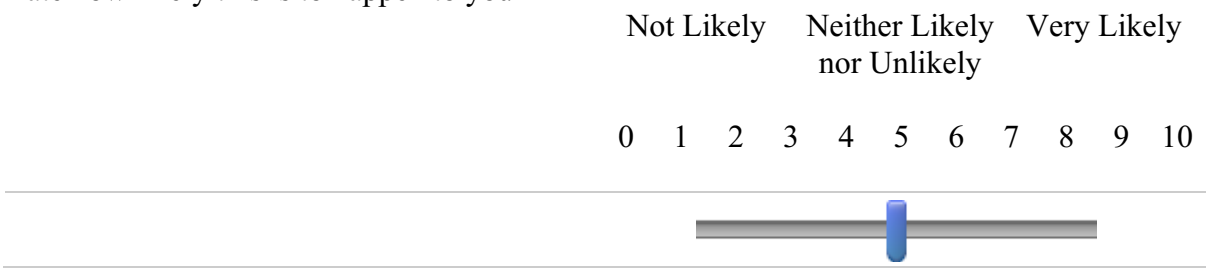


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/5}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/6}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

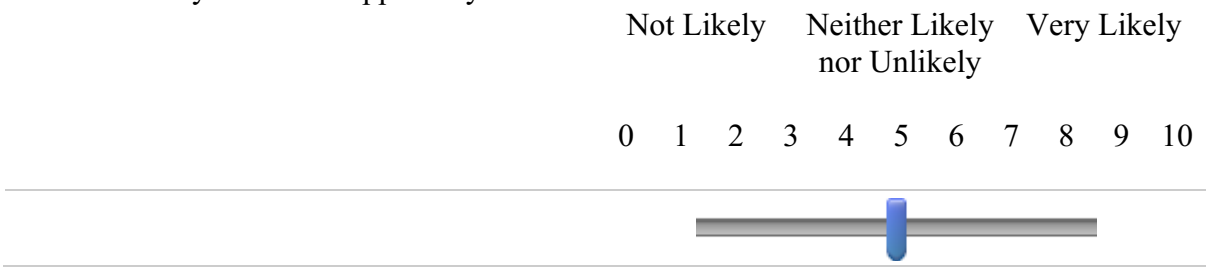
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

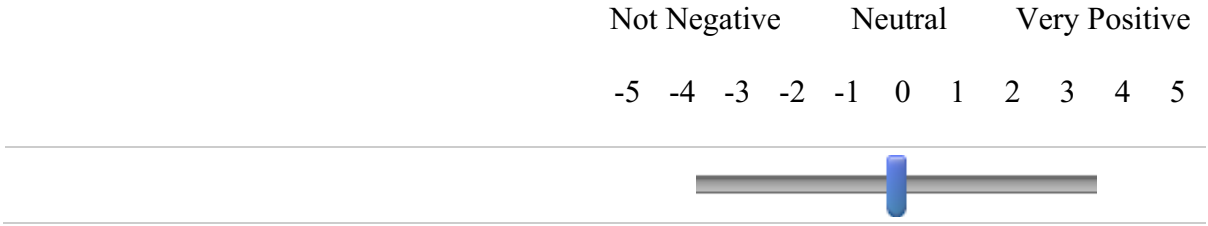
Page Break

For future event: ${Q117/ChoiceTextEntryValue/7}

Rate how likely this is to happen to you

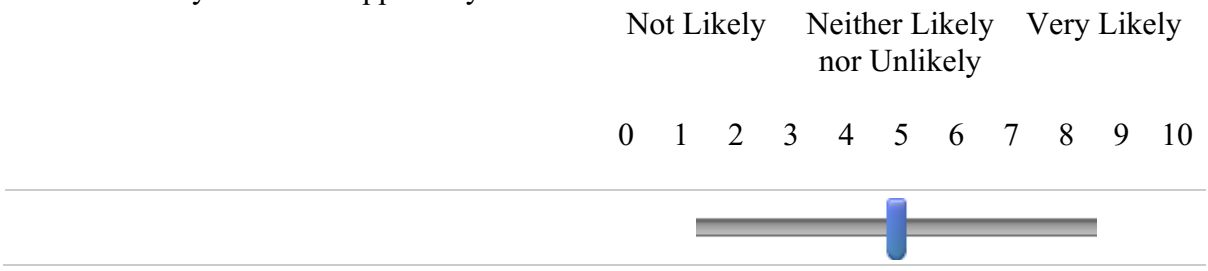


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/8}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/9}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

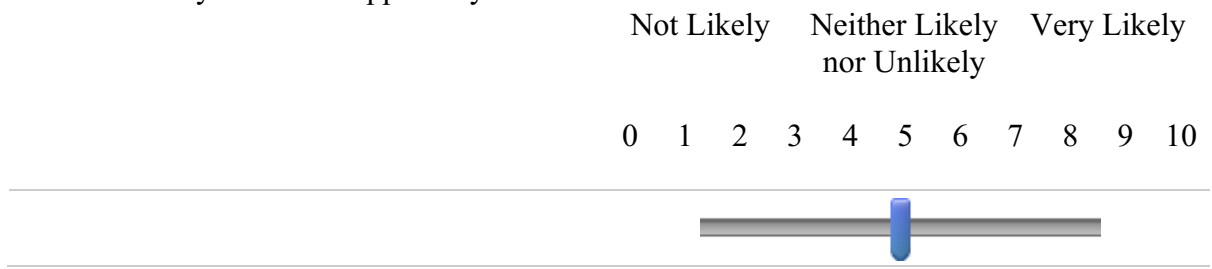
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

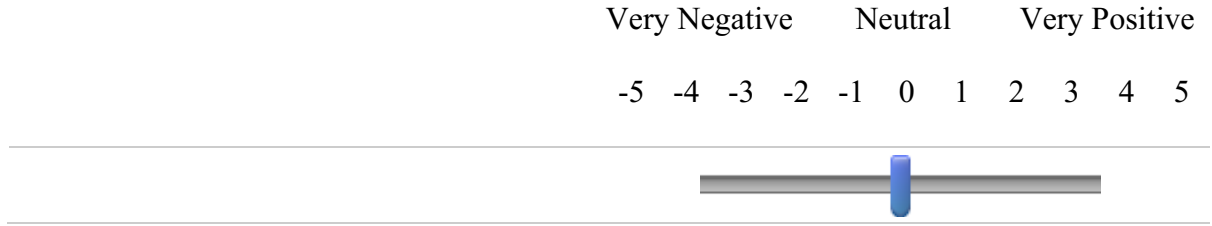
Page Break

For future event: ${Q117/ChoiceTextEntryValue/10}

Rate how likely this is to happen to you

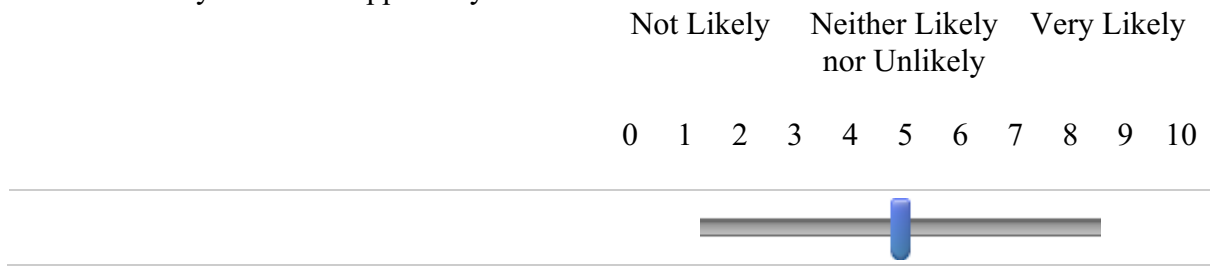


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/11}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/12}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

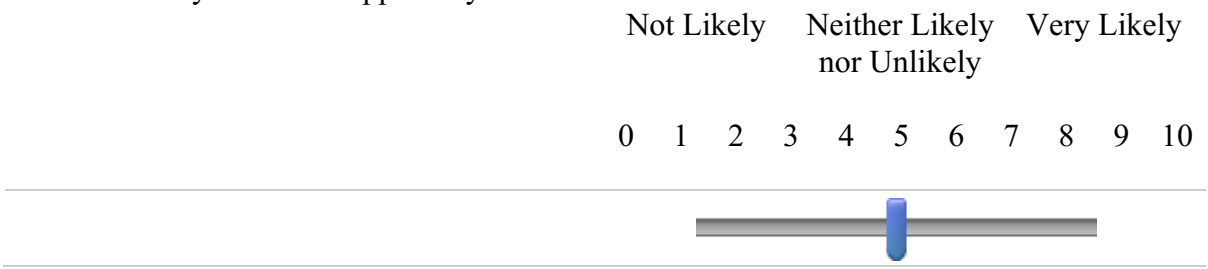
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

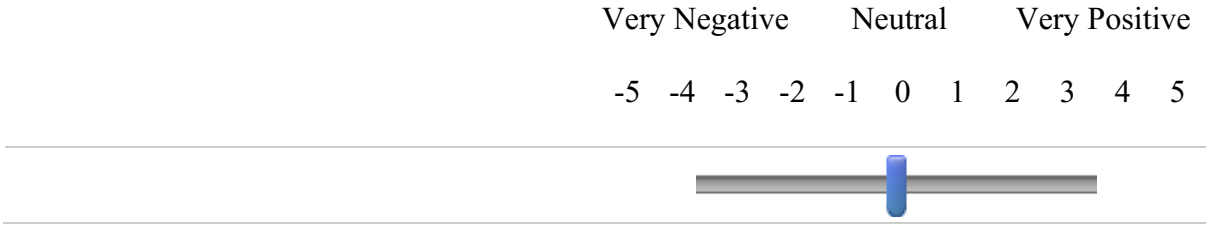
Page Break

For future event: ${Q117/ChoiceTextEntryValue/13}

Rate how likely this is to happen to you

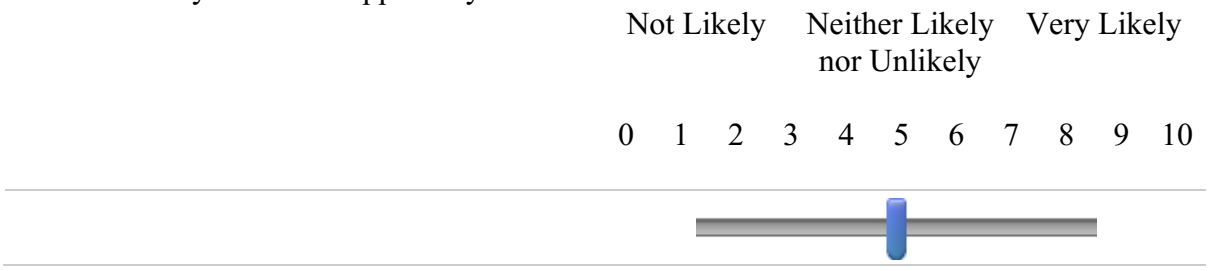


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/14}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/15}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

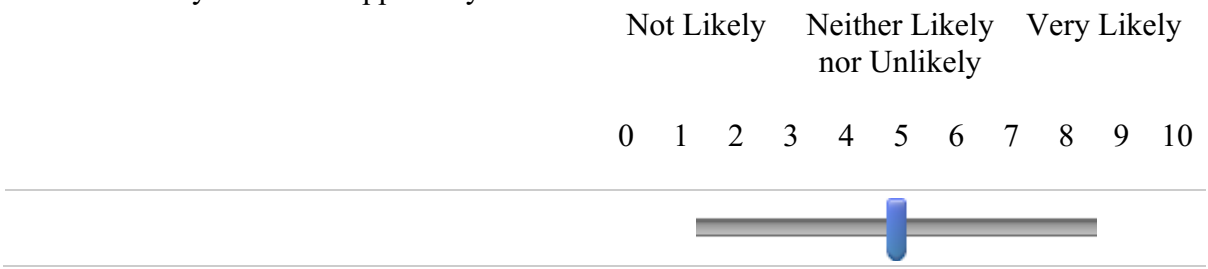
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

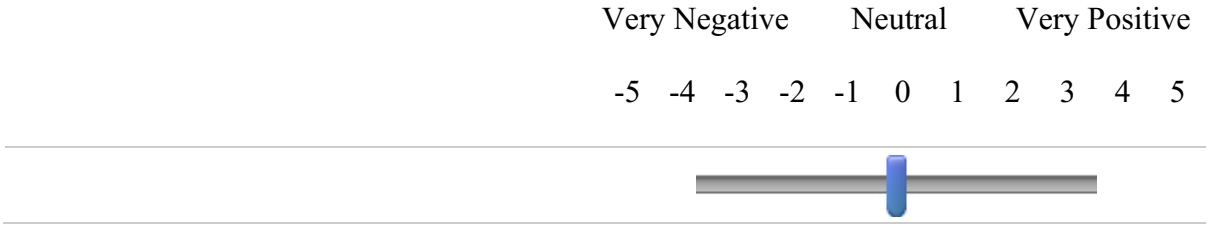
Page Break

For future event: ${Q117/ChoiceTextEntryValue/16}

Rate how likely this is to happen to you

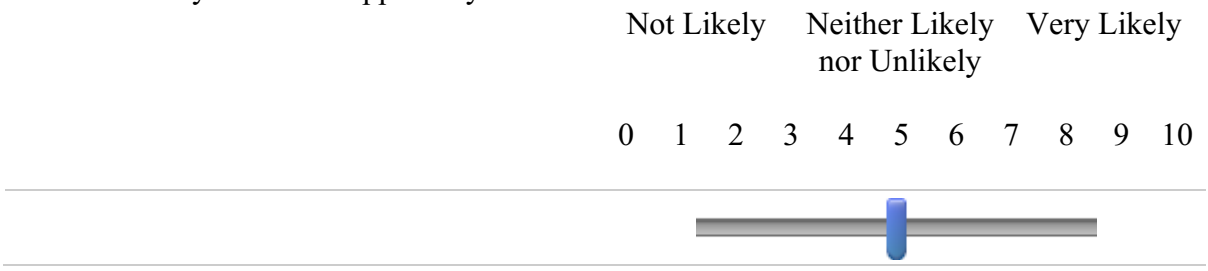


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/17}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

For future event: ${Q117/ChoiceTextEntryValue/18}

Rate how likely this is to happen to you

Not Likely Neither Likely nor Unlikely Very Likely

0 1 2 3 4 5 6 7 8 9 10

If this event did happen, how would you feel at that time?

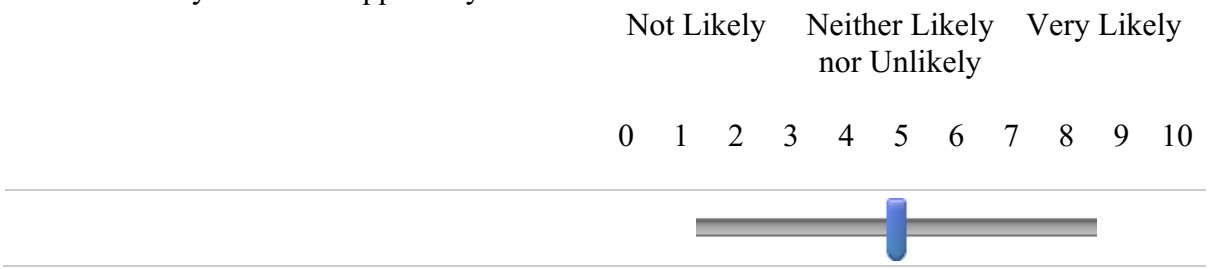
Very Negative Neutral Very Positive

-5 -4 -3 -2 -1 0 1 2 3 4 5

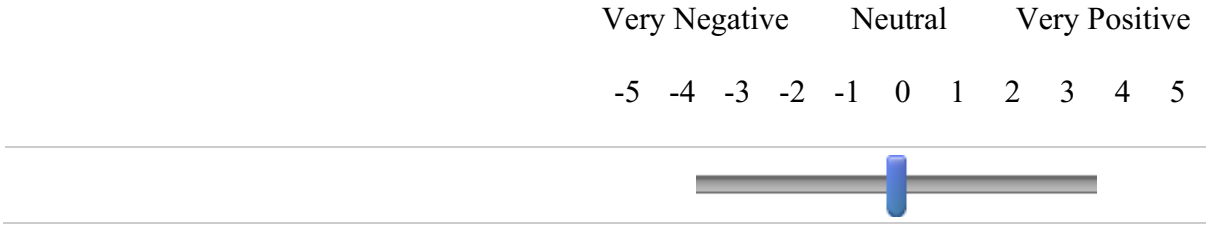
Page Break

For future event: ${Q117/ChoiceTextEntryValue/19}

Rate how likely this is to happen to you

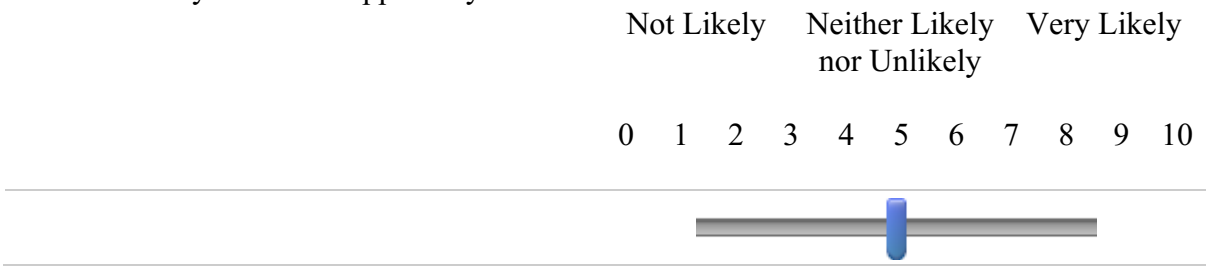


If this event did happen, how would you feel at that time?



For future event: ${Q117/ChoiceTextEntryValue/20}

Rate how likely this is to happen to you



If this event did happen, how would you feel at that time?

-5 -4 -3 -2 -1 0 1 2 3 4 5

End of Block: PFT 5-10 years

Start of Block: Intention (one week)

Type in three goals or plans that you want to fulfill within the next 7 days (including today). Click the arrow when you are finished.

- 1 _____
- 2 _____
- 3 _____

Page Break

Please rate how likely or unlikely it is that you will do the following goals.

	Unlikely 1	2	3	4	5	6	Likely 7
${Q159/ChoiceTextEntryValue/1}							
${Q159/ChoiceTextEntryValue/2}							
${Q159/ChoiceTextEntryValue/3}							

Please rate how important the following goals are to you.

	Not Important 1	2	3	4	5	6	Very Important 7
${Q159/ChoiceTextEntryValue/1}							
${Q159/ChoiceTextEntryValue/2}							
${Q159/ChoiceTextEntryValue/3}							

Page Break

I am now going to ask you to type in the steps you would take to achieve the goals that you identified. You will have a **maximum of five minutes** for each goal to type in the steps that you would take to fulfill the three goals you identified. If you cannot think of anymore steps for the goal, **you have the option to continue to the next goal after two minutes by clicking the arrow at the bottom of the page.** As soon as you click the arrow, you will be directed to the next goal you identified and the timer will begin. If five minutes pass, you will automatically be directed to the next goal.

Click the arrow to begin.

Page Break

Now type the steps you would take to ${Q159/ChoiceTextEntryValue/1}. Type in one step per box. You do not have to fill in all the boxes but please be as specific as possible.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

Now type the steps you would take to ${Q159/ChoiceTextEntryValue/2}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

Now type the steps you would take to ${Q159/ChoiceTextEntryValue/3}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

End of Block: Intention (one week)

Start of Block: Intention (one year)

Type in three goals that you want to fulfill within the next 6-12 months. These can be goals or plans. Click the arrow when you are finished.

- 1 _____
- 2 _____
- 3 _____

Page Break

Please rate how likely or unlikely it is that you will do the following goals.

	Unlikely					Likely	
	1	2	3	4	5	6	7
${Q169/ChoiceTextEntryValue/1}							
${Q169/ChoiceTextEntryValue/2}							
${Q169/ChoiceTextEntryValue/3}							

Please rate how important the following goals are to you.

	Not Important					Very Important	
	1	2	3	4	5	6	7
${Q169/ChoiceTextEntryValue/1}							
${Q169/ChoiceTextEntryValue/2}							
${Q169/ChoiceTextEntryValue/3}							

Page Break

I am now going to ask you to type in the steps you would take to achieve the goals that you identified. You will have a **maximum of five minutes** for each goal to type in the steps that you would take to fulfill the three goals you identified. If you cannot think of anymore steps for the goal, **you have the option to continue to the next goal after two minutes by clicking the arrow at the bottom of the page.** As soon as you click the arrow, you will be directed to the next goal you identified and the timer will begin. If five minutes pass, you will automatically be directed to the next goal.

Click the arrow to begin.

Page Break

Now type the steps you would take to ${Q169/ChoiceTextEntryValue/1}. Type one step per box. You do not have to fill in all the boxes.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

Now type the steps you would take to ${Q169/ChoiceTextEntryValue/2}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

Now type the steps you would take to ${Q169/ChoiceTextEntryValue/3}. Type one step per box. You do not have to fill in all the boxes.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____

End of Block: Intention (one year)

Start of Block: Intention (5-10 years)

Type in three goals that you want to fulfill within the next 5-10 years. These can be goals or plans. Click the arrow when you are finished.

- 1 _____
- 2 _____
- 3 _____

Page Break

Please rate how likely or unlikely it is that you will do the following goals.

	Unlikely 1	2	3	4	5	6	Likely 7
${Q164/ChoiceTextEntryValue/1}							
${Q164/ChoiceTextEntryValue/2}							
${Q164/ChoiceTextEntryValue/3}							

Please rate how important the following goals are to you.

	Not Important 1	2	3	4	5	6	Very Important 7
${Q164/ChoiceTextEntryValue/1}							
${Q164/ChoiceTextEntryValue/2}							
${Q164/ChoiceTextEntryValue/3}							

Page Break

I am now going to ask you to type in the steps you would take to achieve the goals that you identified. You will have a **maximum of five minutes** for each goal to type in the steps that you would take to fulfill the three goals you identified. If you cannot think of anymore steps for the goal, **you have the option to continue to the next goal after two minutes by clicking the arrow at the bottom of the page.** As soon as you click the arrow, you will be directed to the next goal you identified and the timer will begin. If five minutes pass, you will automatically be directed to the next goal.

Click the arrow to begin.

Page Break

Now type the steps you would take to ${Q164/ChoiceTextEntryValue/1}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

Now type the steps you would take to ${Q164/ChoiceTextEntryValue/2}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

Now type the steps you would take to ${Q164/ChoiceTextEntryValue/3}. Type one step per box. You do not have to fill in all the boxes.

- ○ 1 _____
- ○ 2 _____
- ○ 3 _____
- ○ 4 _____
- ○ 5 _____
- ○ 6 _____
- ○ 7 _____
- ○ 8 _____
- ○ 9 _____
- ○ 10 _____
- ○ 11 _____
- ○ 12 _____
- ○ 13 _____
- ○ 14 _____
- ○ 15 _____
- ○ 16 _____
- ○ 17 _____
- ○ 18 _____
- ○ 19 _____
- ○ 20 _____

End of Block: Intention (5-10 years)

Start of Block: ASI-3

Now I am going to ask you to answer some questions about your mood. Please answer each question to the best of your ability.

Page Break

Please select the answer that best corresponds to how much you agree with each item. If any items concern something that you have never experienced (e.g., fainting in public) answer on the basis of how you think you might feel if you had such an experience. Otherwise, answer all items on the basis of your own experience.

	Very Little	A Little	Some	Much	Very Much
It is important for me not to appear nervous.	○	○	○	○	○
When I cannot keep my mind on task, I worry that I might be going crazy.	○	○	○	○	○
It scares me when my heart beats rapidly.	○	○	○	○	○
When my stomach is upset, I worry that I might be seriously ill.	○	○	○	○	○
It scares me when I am unable to keep my mind on a task.	○	○	○	○	○
When I tremble in the presence of others, I fear what people might think of me.	○	○	○	○	○

When my chest feels tight, I get scared that I won't be able to breathe properly.	○	○	○	○	○
When I feel pain in my chest, I worry that I am going to have a heart attack.	○	○	○	○	○
I worry that other people will notice my anxiety.	○	○	○	○	○
When I feel "spacey" or spaced out I worry that I may be mentally ill.	○	○	○	○	○
It scares me when I blush in front of people.	○	○	○	○	○
When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.	○	○	○	○	○

When I begin to sweat in a social situation, I fear people will think negatively of me.	○	○	○	○	○
When my thoughts seem to speed up, I worry that I might be going crazy.	○	○	○	○	○
When my throat feels tight, I worry that I could choke to death.	○	○	○	○	○
When I have trouble thinking clearly, I worry that there is something wrong with me.	○	○	○	○	○
I think it would be horrible for me to faint in public.	○	○	○	○	○
When my mind goes blank, I worry there is something terribly wrong with me.	○	○	○	○	○

End of Block: ASI-3

Start of Block: CES-D

The following items may be ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
I was bothered by things that usually don't bother me.	○	○	○	○
I did not feel like eating; my appetite was poor.	○	○	○	○
I felt that I could not shake off the blues even with help from my family or friends.	○	○	○	○
Select "Occasionally or a moderate amount of time (3-4 days)"	○	○	○	○
I felt I was just as good as other people.	○	○	○	○
I had trouble keeping my mind on what I was doing.	○	○	○	○
I felt depressed.	○	○	○	○
I felt that everything I did was an effort.	○	○	○	○
I felt hopeful about the future.	○	○	○	○
Select "Some or a little of the time (1-2 days)"	○	○	○	○

I thought my life had been a failure.	○	○	○	○
I felt fearful.	○	○	○	○
My sleep was restless.	○	○	○	○
I was happy.	○	○	○	○
I talked less than usual.	○	○	○	○
I felt lonely.	○	○	○	○
People were unfriendly.	○	○	○	○
I enjoyed life.	○	○	○	○
I had crying spells.	○	○	○	○
I felt sad.	○	○	○	○
Select "Most or all of the time (5-7 days)"	○	○	○	○
I felt that people dislike me.	○	○	○	○
I could not get "going."	○	○	○	○

End of Block: CES-D

Start of Block: Hopelessness Scale

Please select true or false for the following statements.

	True	False
Things just won't work out the way I want them to.	○	○
I never get what I want so it's foolish to want anything.	○	○
I just don't get the breaks, and there's no reason to believe I will in the future	○	○
It is very unlikely that I will get any real satisfaction in the future.	○	○
I don't expect to get what I really want.	○	○
My future seems dark to me.	○	○
Select "False"	○	○
The future seems vague and uncertain to me.	○	○
I can't imagine what my life would be like in ten years.	○	○
I look forward to the future with hope and enthusiasm.	○	○
I have great faith in the future.	○	○
When I look ahead to the future, I expect to be happier than I am now.	○	○
Select "True"	○	○
In the future, I expect to succeed in what concerns me most.	○	○
I can look forward to more good times than bad times.	○	○

When things are going badly, I am helped by knowing they can't stay that way forever.	○	○
I expect to get more of the good things in life than the average person.	○	○
All I can see ahead of me is unpleasantness rather than pleasantness	○	○
There's no use in really trying to get something I want because I probably won't get it.	○	○
Select "True"	○	○
I might as well give up because I can't make things better by myself.	○	○
My past experiences have prepared me well for the future.	○	○
I have enough time to accomplish the things I most want to do.	○	○

End of Block: Hopelessness Scale

Appendix C: IRB Letter

Appalachian STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD
Office of Research Protections
ASU Box 32068
Boone, NC 28608
828.262.2692
Web site: http://researchprotections.appstate.edu
Email: irb@appstate.edu
Federalwide Assurance (FWA) #00001076

To: Brittany Foster
Psychology
CAMPUS EMAIL

From: Nat Krancus, IRB Administrator
Date: 10/02/2020
RE: Notice of Exempt Research Determination

STUDY #: 20-0239
STUDY TITLE: Episodic Future-Thinking and Goal Setting

Exemption Category: 2.Survey, interview, public observation
NOTE: This project, like all exempt and non-exempt research with human subjects at Appalachian State University, is subject to other requirements, laws, regulations, policies , and guidelines of the University and the state of North Carolina. As of August 24, 2020 and until further notice, this includes the requirement by the Office of Research to pause in-person research projects until it receives an additional review to ensure the existence of an adequate COVID-19 mitigation protocol. Please see the full requirement on theResearch Protections website, as well as answers to questions you may have.

This study involves no more than minimal risks and meets the exemption category or categories cited above. In accordance with the 2018 federal regulations regarding research with human subjects [45 CFR 46.101(b)] and University policy and procedures, the research activities described in the study materials are exempt from IRB review. If this study was previously reviewed as non-exempt research under the pre-2018 federal regulations regarding research with human subjects, the Office of Research Protections staff reviewed the annual renewal and the initial application and determined that this research is now exempt from 45 CFR 46.101(b) and thus IRB review.

What a determination of exempt research means for your project:

1. The Office of Research Protections staff have determined that your project is research, but it is research that is exempt from the federal regulations regarding research.
2. Because this research is exempt from federal regulations, the recruitment and consent processes are also exempt from IRB review. This means that the procedures you described and the materials you provided were not reviewed Office of Research Protections staff, further review if these materials are not necessary, and you can change these procedures and materials without review from this office. You can use the consent materials you may have provided in the application, but you can change the consent procedures and materials without submitting a modification. **Note that if your consent form states that the study was "approved by the IRB" this should be removed. You can replace it with a sentence that says that the study was determined to be exempt from review by the IRB Administration. In addition, be sure that the number you have listed for the IRB is 828-262-4060.**
3. **You still need to get consent from adult subjects and, if your study involves children, you need to get assent and parental permission.**At the very least, your consent, assent, and parental permission processes should explain to research subjects: (a)the purpose, procedures, risks, and benefits of the research; (b) if compensation available; (c) that the research is voluntary and there is no penalty or loss of benefits for not participating or discontinuing participation; and (d) how to contact the Principal Investigator (and faculty advisor if the PI is a student). You can also use exempt research consent template, which accounts for all of these suggested elements of consent: https://researchprotections.appstate.edu/human-subjects-irb/irb-forms.
4. **Special Procedures and populations for which specific consent language is suggested.** Research involving children, the use of the SONA database for recruitment, research with students at Appalachian State University, or MTurk should use the specific language outlined by Office of Research Protections on our website: https://researchprotections.appstate.edu/human-subjects-irb/consent-corner.
5. **Non-procedural Study Changes**: most changes to your research will not require review by the Office of Research Protections. However, the following changes require further review by our office:

- the addition of an external funding source,
- the addition of a potential for a conflict of interest,
- a change in location of the research (i.e., country, school system, off site location),
- the contact information for the Principal Investigator,
- the addition of non-Appalachian State University faculty, staff, or students to the research team, or

6. **Changes to study procedures.** If you change your study procedures, you may need to submit a modification for further review. Changes to procedures that may require a modification are outlined in our SOP on exempt research, a link to which you can find below. Before submitting a modification to change procedures, we suggest contacting our office atirb@appstate.edu or (828)262-4060.

Investigator Responsibilities: All individuals engaged in research with human participants are responsible for compliance with University policies and procedures, and IRB determinations. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records. The PI should review the IRB's list of PI responsibilities.

To Close the Study: When research procedures with human participants are completed, please send the Request for Closure of IRB Review form to irb@appstate.edu.

If you have any questions, please contact the IRB Adminstrator at (828) 262-4060.

Best wishes with your research.

Important Links for Exempt Research:

Note: If the link does not work, please copy and paste into your browser, or visit https://researchprotections.appstate.edu/human-subjects.

1. Standard Operating Procedure for exempt research (#9): https://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/sop_9_approved_1.21.2019.pdf

2. PI responsibilities: https://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI%20Responsibilities.pdf

3. IRB forms: http://researchprotections.appstate.edu/human-subjects/irb-forms

CC:
Lisa Emery, Psychology

Vita

Brittany Michelle Foster was born in Marion, NC, to Don and Beth Foster. She graduated from McDowell High School in 2015. The following autumn, she entered Appalachian State University to study Psychology. In May 2019, she was awarded a Bachelor of Science in Psychology, with Psychology departmental honors. In the fall of 2019, she began graduate school at Appalachian State University in the Clinical Psychology doctoral (Psy.D) program under the mentorship of Dr. John Paul Jameson. Her career plan is to be a psychologist that serves rural underserved areas in North Carolina.