EXAMINING THE NEURAL UNDERPINNINGS OF THE CONGENIALITY BIAS

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Decision-making is a fundamental aspect of everyday life with individuals making an innumerable number of decisions throughout the course of the lifespan. To maximize the probability of optimal decision-making individuals often utilize external evidence as the basis for decisions (Fischer & Greitemeyer, 2010). Unfortunately, research in the realm of decision-making has consistently found evidence that individuals exhibit a post-decisional distortion of information known as the congeniality bias or selective exposure effect (Hart et al., 2009). That is, individuals tend to exhibit a systematic preference for information that is consistent with current attitudes, beliefs, and decisions (Fischer, Jonas, Frey & Schulz-Hardt, 2005; Fischer, Schulz-Hardt & Frey, 2008). Exhibiting a systematic preference for congenial information may prove problematic for decision makers because the congeniality bias might disrupt the ability to engage in optimal decision-making, resulting in an increased likelihood of making poor quality decisions (Fischer & Greitemeyer, 2010; Frey, 1981).

Because of its' potential to impair decision making, researchers have exhibited great interest in understanding the processes underlying the congeniality bias. Two competing explanations exist for the congeniality bias. Some researchers propose that the preference for congenial information is the result of a defense motivation related to the experience of cognitive dissonance, whereas others propose that the congeniality bias results from motivation to make accurate decisions (Fischer & Greitemeyer, 2010; Hart et al., 2009). Although evidence exists supporting both explanations, recent advances in attitude and emotional regulation research have the potential to allow a comparison of these competing theories utilizing physiological measures. The purpose of the current study was to utilize event related potential (ERP) techniques to test propositions related to defensive motivation and accuracy motivation.

Defensive Motivation

Early attempts to explain the congeniality bias arose from cognitive dissonance theory (Festinger, 1957). In this seminal theory, Festinger proposed that people are highly motivated to maintain cognitive consistency. When confronted with cognitive inconsistencies, such as a discrepancy between attitudes and behavior, individuals experience cognitive dissonance; an aversive state of psychological discomfort (Heine & Lehman, 1997). In the realm of decision-making, cognitive dissonance arises when individuals examine the positive aspects of non-chosen decision alternatives and the negative aspects of the chosen decision alternative. This evaluation of decision alternatives thus creates dissonance by drawing attention to the possibility that a better decision may have been possible (Fischer et al., 2005; Fischer & Greitemeyer, 2010; Heine & Lehman, 1997).

Furthermore, dissonance theory predicts that individuals will be motived to reduce the aversive psychological state of dissonance through the implementation of reduction strategies (Festinger, 1957). In the decision-making context the dissonance reduction strategy often manifests as the congenitally bias which is characterized by a decision maker seeking or preferring decision-consistent information while neglecting decision-inconsistent information (Fischer et al., 2005). Exposure to decision-consistent information decreases cognitive dissonance by bolstering the decision makers chosen alternative resulting in an increased confidence that the correct decision has been made (Heine & Lehman, 1997). Overall, dissonance theory holds that the congeniality bias is the result of a defensive motivation to defend personal decisions and protect the self against feelings of cognitive dissonance (Fischer & Greitemeyer, 2010).

Contrary to the predictions of dissonance theory, early researchers reported situations where individuals exhibit a preference for decision inconsistent information (Feather, 1963). To account for situations where uncongenial information seems to be preferred, Festinger (1964) proposed several modifications to his original conceptualization of dissonance theory. Specifically, Festinger (1964) proposed confidence in the ability to refute uncongenial information influences information preferences such that uncongenial information is preferred when it is believed to be of a low quality and easily refutable. This preference stems from the long lasting dissonance reduction that accompanies the ability to refute information that is inconsistent with current attitudes, beliefs, or decisions (Frey, 1986). Festinger's modifications also predicted uncongenial information will be preferred when it is considered to be highly relevant to future decisions and will help avoid future dissonance (Frey, 1986).

Evidence for the role of defensive motivation can be found in a recent meta-analysis. Hart et al. (2009) found variables related to the strength of defensive motivation moderate the congeniality bias. More specifically, variables thought to increase one's defensive motivation resulted in an increased preference for consistent information (Hart et al., 2009). For example, individuals are more likely to exhibit the congeniality bias when information has a high-perceived quality, when individuals were highly committed to an attitude, when information is considered to be relevant, when individuals exhibit high degrees of close-mindedness, and when there is high confidence in the attitude. In addition, Hart et al. (2009) propose the influence of defensive motivation on the congeniality bias is reduced when there is no challenge to previously held attitudes.

Accuracy Motivation

An alternative explanation is that the congeniality bias results from motivation to make accurate decisions. Unfortunately, there is disagreement regarding how a desire to make accurate decisions contributes to the congeniality bias. One viewpoint suggests that during the decision-making process individuals are motivated to objectively evaluate all available information and make accurate decisions (Fischer & Greitemeyer, 2010; Hart et al., 2009). The desire to make an accurate decision should logically result in individuals objectively examining information in relation to its quality. However, research has suggested that differences in the processing of consistent and inconsistent information influence the perceived quality of information (Fischer & Greitemeyer, 2010). For example, it is more difficult for individuals to process inconsistent information compared to consistent information (Fischer & Greitemeyer, 2010).

Because of the difficulty associated with processing decision-inconsistent information, individuals tend to be more critical of attitude and decision discrepant information, and as a result are more likely to consider it to be of a low quality. Conversely, due to the relative ease of processing decision consistent information, individuals tend to be less critical when evaluating it and consider the information to be of higher quality (Fischer & Greitemeyer, 2010). Therefore, despite a motivation to use quality information to make accurate decisions, individuals may unintentionally exhibit a systematic preference for decision-consistent information (Fischer & Greitemeyer, 2010; Fischer, Schulz-Hardt, & Frey, 2008).

However, another viewpoint suggests the congeniality bias is not the result of processing differences but instead is strictly the consequence of information utility (Hart et al., 2009). According to this interpretation, accuracy motivation will cause individuals to seek out information that will increase the probability of making high quality decisions regardless of how

the information relates to preexisting attitudes or decisions (Hart et al., 2009). Therefore, accuracy motivation will increase the congeniality bias when congenial information is considered to be of high utility but will reduce the congeniality bias when uncongenial information is considered to be of high utility (Hart et al., 2009). A recent meta-analysis by Hart et al. (2009) found support for this interpretation of accuracy motivation. Specifically, the analysis revealed the congeniality bias is often stronger when congenial information is of high utility and is perceived as being relevant to the experimental goal (Hart et al., 2009).

The Late Positive Potential

With recent technological advancements researchers have begun utilizing physiological measures, such as the electroencephalograph (EEG), to examine the neural underpinnings and time course of various cognitive processes (Hajcak, Dunning, & Foti, 2009). EEG measures have contributed to the understanding of cognitive processing by assessing brain activity through electrodes strategically placed on the research participant's scalp. These electrodes are sensitive to changes in electrical activity resulting from changes in neural activity and the generation of action potentials (Luck, 2005). The use of EEG recordings allows researchers to examine passive recordings of neural activity but does not allow for the effective examination of the temporal sequences involved in cognitive processing. To overcome this potential shortcoming, researchers have begun utilizing event related potentials (ERP) to examine topics of interest (Cacioppo et al., 1996; Hajcak & Olvet, 2008). ERP refers to a technique that allows researchers to examine voltage changes associated with specific sensory, motor, and cognitive events by averaging the neural activity measured via EEG after the onset of a particular stimulus (Cacioppo at al., 1996; Luck, 2005; Picton et al., 2000).

ERP techniques have been applied to several relevant research domains with notable success, namely those investigating evaluative categorization and affective processing. For example, physiological measures have expanded our knowledge of evaluative categorizations by providing valuable insight into the neural correlates involved in evaluations focusing on the favorable and unfavorable aspects of objects (Cacioppo et al., 1994; Maio & Haddock, 2010). These examinations have broad implications as general positive/ negative evaluations are considered by many to be a key component of personal attitudes (Cacioppo et al., 1994; Crites et al., 1995; Eagly & Chaiken, 2007). Similarly, researchers have employed ERP methods to better understand affective processing and specifically the allocation of attentional resources to processing stimuli of varying emotional valence (Hajcak, Dunning, & Foti, 2009; Hajcak & Olvet, 2008).

Perhaps the most notable finding coming from studies examining evaluative categorization and affective processing is the identification of a waveform that appears to an indicator of underlying cognitive processes (Cacioppo et al., 1994; Dhont et al., 2012; Hajcak & Olvet, 2008). The waveform, known as the late positive potential (LPP), is a positive voltage potential that occurs 300-900 milliseconds after the onset of a stimulus (Cacioppo et al., 1994; Cacioppo et al., 1996; Hajcak & Olvet, 2008). Similar to other ERP waveforms, the LPP seems to be an indicator of the cognitive resources being devoted to processing motivationally relevant stimuli in the environment with greater amplitudes reflecting a greater devotion of cognitive resources (Cacioppo et al., 1994; Dunning & Hajcak, 2009; Gehring, Gratton, Coles, & Donchin, 1992).

Characteristics of the Late Positive Potential

Studies investigating evaluative categorizations have noted the LPP shares several notable characteristics of the P300, a waveform that is thought to reflect the automatic devotion of attentional resources to processing stimuli in the environment (Cacioppo et al., 1994; Hajcak et al., 2009). Similar to the P300, the LPP appears to be sensitive to the evaluative consistency of presented stimuli. Specifically, stimuli that are inconsistent with the situational context elicit larger LPP amplitudes than context consistent stimuli. Additionally, investigations have suggested the average latency of the LPP is similar to the latency window of the P300 with increased LPP amplitudes occurring within the time range typically associated with the P300 waveform (Cacioppo et al., 1994; Cacioppo et al., 1996; Hajcak et al., 2009). The similarities between the waveforms have led some researchers to conclude the LPP may be a long latency P300 component (Cacioppo et al., 1994).

However, investigations of affective processing have noted important differences between the traditional P300 and LPP waveforms. For example, empirical investigations have suggested exposure to emotional stimuli often elicits later peaking LPP amplitudes that are sustained for an extended period of time (Hajcak et al., 2009). Furthermore, investigations of affective processing have suggested the later peaking LPP amplitudes can be altered by motivated attempts to direct attentional resources. Specifically, studies have suggested that directing attention toward arousing portions of emotional stimuli can elicit greater LPP amplitudes while focusing on less arousing aspects of emotional stimuli results in decreased LPP amplitudes (Dunning & Hajcak, 2009; Hajcak et al., 2009). This has led some to suggest the early increases in LPP amplitude, which are similar to the P300, may reflect environmental stimuli automatically capturing attention while the later-peaking sustained amplitudes may

reflect more controlled cognitive processes and motivated attempts to direct attentional resources (Hajcak et al., 2009).

Overview of the Present Study

The purpose of the present study was to examine the neural correlates of the congeniality bias. More specifically, an ERP paradigm was devised to test propositions related to the defensive motivation and accuracy motivation theories of the congeniality bias. Reviewed research has identified the LPP waveform as indicating the amount of attentional resources being used when evaluating stimuli (Cacioppo et al., 1994; 1996; Hajcak et al., 2009). Therefore, I reasoned that an ERP paradigm would allow comparison of the cognitive resources utilized when examining congenial (decision consistent) or uncongenial (decision inconsistent) information.

Defensive motivation and accuracy motivation predict that individuals will approach congenial and uncongenial information differently during the decision-making context (Fischer & Greitemeyer, 2010). Defensive motivation predicts that individuals will avoid uncongenial information; however, accuracy motivation predicts uncongenial information will be highly scrutinized and compared to congenial information within the decision-making context (Fischer & Greitemeyer, 2010). In the only published study to date to examine the neural correlates of the congeniality bias, Fischer et al. (2013) suggested that congenial information is processed more deeply and better remembered than uncongenial information, as evidenced by greater theta wave activity. This finding supports Festinger’s classic conceptualization of cognitive dissonance theory and the defensive motivation explanation of the congeniality bias. Unfortunately, the methodology utilized by Fischer et al. (2013) utilized a passive measurement of neural activity and did not include a behavioral response. Without a behavioral response, it is impossible to determine if the patterns of theta wave activity noted by Fischer et al. (2013) were associated

with the congeniality bias. To address these limitations, participants in the current study engaged in a behavioral response during which they indicated if they would like to receive additional information related to the job performance of fictitious employees. Additionally, in an attempt to provide a more direct measure of cognitive resources the current study measured mean LPP amplitudes, which is waveform indicative of sustained attention, throughout the experimental procedure to determine the amount of attentional resources used to process congenial and uncongenial information.

Hypothesis 1. Based on previous research showing that individuals often exhibit a preference for congenial information during the decision making process (Hart et al., 2009), it was hypothesized that participants would exhibit an overall preference for decision consistent information.

Hypothesis 2. Engaging in evaluative judgments results in enhanced LPP amplitudes within the parietal regions of the right hemisphere, and the right lateralized LPP is most pronounced when confronted with evaluatively inconsistent stimuli (Cacioppo et al., 1996). Given these findings, it was hypothesized that participants would exhibit enhanced amplitudes within the early portions of the LPP waveform (i.e. P300) in the parietal regions of the right hemisphere, with the effect being most pronounced when processing decision inconsistent information.

Hypothesis 3. Finally, based on propositions related to the classic conceptualization of dissonance theory, it was hypothesized that participants would devote more cognitive resources to processing decision consistent information compared to decision inconsistent information. Previous research has suggested increased attention persists longer for certain types of stimuli (Hajcak & Olvet, 2008). In support of dissonance theory, it was predicted increased attention

toward congenial versus uncongenial information would be evidenced by sustained differences in LPP amplitude. Specifically, it was hypothesized that exposure to decision consistent information would result in a greater mean amplitude throughout the duration of the LPP.

Method

Participants

Participants were introductory psychology students (*N* = 21, 81% female, 76% Caucasian) at a large Midwestern (U.S.) university who participated in partial fulfillment of course requirements. Mean age was 19.71 years (*SD* = 3.18).

Materials

Vignettes. Participants were exposed to a paradigm commonly used during selective exposure research focusing on a preliminary decision to extend or terminate the contract of a store manager named Mr. Miller (Fischer et al., 2005). Participants were instructed to assume the role of a storeowner evaluating the performance of employees. Participants then read a vignette providing background information about an employee, Mr. Miller, who was hired to manage a fashion store approximately one year ago. The participants were then informed that during his time as manager Mr. Miller's performance has been mixed. For example, Mr. Miller's decision to introduce new fashion lines was successful in bringing new customers into the store. However, numerous customers have been lost due to the changes made by Mr. Miller. Overall, the vignette provided both positive and negative aspects of Mr. Miller's work creating a balanced view of his performance as a store manager.

Modeled after the Mr. Miller vignette, two additional vignettes focusing on decisions to extend or terminate employment contracts were created for this study. One described an assistant

professor (Professor Smith) and the other a physician (Dr. Williams). A copy of the vignettes is available in Appendix A.

Stimuli. Participants were exposed to two categories of stimuli created from Anderson's (1968) list of personality trait words, assessed on 7-point scales (0 = *least favorable or desirable*, 6 = *most desirable or favorable*) in terms of their likableness. Anderson (1968) identified a subgroup of 200 personality trait words that may be useful in an experimental context. Personality traits words from this subgroup were pretested using the same 7-point scale to ensure the likableness ratings provided by Anderson are consistent with ratings provided by members of the research population. A positive trait category was created using the 75 personality trait words with the highest likableness ratings based on the results of the pretest (e.g., sincere, loyal). A negative trait category was created using the 75 personality trait words with the lowest likableness ratings based on the results of the pretest (e.g., dishonest, unkind). Chosen traits in each category were equivalent in terms of valence and were related to job performance. Results of the pretest revealed mean likableness ratings largely consistent with those reported by Anderson (1968). Trait words inconsistent with Anderson's (1968) list of personality trait words were excluded and not included as stimuli (e.g., sarcastic). The list of traits used can be found in Appendix B.

The Edinburgh inventory. The Edinburgh Inventory is a 10-item measure designed to assess participant's handedness. Participants are instructed to indicate which hand they prefer while completing a variety of activities (e.g. writing, throwing, drawing). For each item, participants are instructed to place 2 checkmarks in the appropriate column (e.g. left/right) to indicate a strong preference for a particular hand or single checkmark in each column to indicate no preference. From the responses, a laterality quotient (LQ) is calculated ranging from -100

(totally left handed) to +100 (totally right handed) (McMeekan & Lishman, 1975; Oldfield, 1971). The measure has previously demonstrated high test-retest reliability, $r = +.97$. However, it has been suggested the overall reliability of the measure is somewhat misleading and it is best to consider the test-retest reliability of those with positive and negative LQ's separately, negative LQ $r = +.75$, positive LQ $r = +.86$ (McMeekan & Lishman, 1975). In the current study, participants demonstrated a high degree of right-handedness (*MLQ* = .79, *SD* = .23).

Apparatus. The ERP measurements were collected using an elastic cap and an Active Two Biosemi Electric System (Biosemi, Amsterdam, the Netherlands). The EEG recording was taken with 64-recording channels using silver-chloride electrodes with a BioSemi Active Two system (http://www.biosemi.com; BioSemi B.V., Amsterdam, Netherlands) configured to the 10-20 system. The sampling rate for the system is 2048 hz, which was down-sampled for processing to 512 hz. The electro-oculogram (EOG) was monitored with electrodes FP1 and FP2, as well as 4 additional electrodes placed at lateral and sub-ocular positions in relation to the eyes. Impedances during data collection were kept under 10 kΩ and acquired with an online reference unique to the Active Two system (see: ttp://www.biosemi.com). Offline, data underwent a bandpass filter of .5 to 55hz.

The experimental paradigm was programmed using E-Prime software (http://www.pstnet.com; Psychology Software Tools Inc., Sharpsburg, Pennsylvania, USA). Participants viewed the paradigm on a computer monitor with a 1920 x 1800 resolution and 60 hertz refresh rate. Participants provided their responses using a Cedrus RB-530 response pad.

Procedure

The procedure was modeled after Fischer et al. (2005), Cacioppo et al. (1994), and Hajcak and Olvet (2008). Participants reported to the laboratory where they were greeted by the

researcher. The participants first completed an informed consent and agreed to take part in the study. Participants then completed a health survey designed to assess factors that could influence neurological activity such as history of concussion, history of mood disorders, neurological disorders, and the use of certain medications. Participants also completed the Edinburgh Handedness Inventory (Oldfield, 1971).

Participants were then connected to the equipment required to collect ERP measurements. Participants then took part in the selective exposure paradigm and read one of the employee vignettes via a computer monitor. Based on the information provided in the vignette participants were asked to make a preliminary decision regarding the possible extension or termination of the employment contract. Participants made their preliminary decision regarding the employee's employment contract via response box (Extend/Do Not Extend). After making the preliminary decision participants were informed they would have the opportunity to view additional information related to the individual's performance before making a final decision regarding the possible extension of termination of the individual's contract. Participants were instructed that they would respond to a series of personality traits words associated with the individual's work performance. Specifically, participants were instructed to indicate (Yes/No) if they would like to receive more information detailing how the individual demonstrates the presented personality trait.

The personality traits words were presented to participants in a sequential fashion. Each personality trait word appeared on a computer monitor for 4990 ms. During this time participants considered the presented trait and provided their yes/no responses via response pad. An interstimulus interval during which participants viewed a white screen followed the presentation of each personality trait. The duration of the interstimulus interval varied randomly between 790

ms - 1190 ms to prevent the expectation of stimulus onset from influencing ERP measurements. This portion of the experiment contained of a total of 150 trials separated into 2 blocks consisting of 75 trials each. During each trial, participants were shown a personality trait word randomly selected without replacement (75 positive, 75 negative) until each trait had been sampled. Participants began each block by button press when the appropriate prompt appeared on the computer monitor.

This general sequence of events was repeated until participants had viewed and responded to all three vignettes (in random order). At the conclusion of the experiment participants were debriefed and thanked for their time. The general procedure for each experimental block is detailed in Figure 1.

Results

Behavioral Data

Participant's behavioral data were examined to test for evidence of the congeniality bias. An overall congeniality bias score was created for each vignette by computing the difference between the number of decision consistent traits selected (e.g., "trustworthy" and renewing the employment contract) and decision inconsistent traits selected (e.g., "lazy" and renewing the contract). The difference scores are interpreted such that positive values indicate an overall preference for decision consistent information, zero indicates an equal selection of decision consistent and inconsistent information, and negative values indicate a preference for decision inconsistent information.

Participants exhibited slight preferences for decision consistent information when selecting traits related to the Miller vignette (M = 1.66, SD = 26.27) and the Williams vignette (M = 0.71, SD = 25.83). Unexpectedly, participants exhibited a slight preference for decision

inconsistent information when selecting traits related to the Smith vignette (*M* = -0.52*, SD* = 27.66). Combining the three vignettes together, participants exhibited a slight preference for decision consistent information (*M* = 0.61, *SD* = 22.02). However, this slight preference did not differ significantly from zero, $t(20) = 0.13$. $p > .05$. $d = .02$.

EEG Data Preprocessing And ERP Creation

Automated artifact rejection was performed prior to averaging to discard trials during which an eye movement, blink or amplifier blocking occurred. Artifact criteria of ±75 μV from −100 to 1000 ms of stimulus onset were applied, and the data were visually inspected for blinks and eye movements. The remaining trials were then averaged per condition, with a baseline of −100 to 1000 ms. For analysis and display purposes, data were filtered with a 5th order Butterworth filter of .1-100 hz and referenced digitally to averaged mastoids.

ERP Data Primary Analysis

To investigate participants' neural activity a within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent trait), cortical hemisphere (Left/Right), cortical cluster (Frontal/Parietal) and time window (300-400, 400-500, 500-600, 600-700,700-800ms) as factors. Cortical clusters were created through an examination of the grand average. The grand average is presented in Figure 2. Specifically, electrodes that demonstrated both increased LPP amplitudes for inconsistent information during the initial consideration of information and increased amplitudes for consistent information during periods of sustained attention were clustered together. This pattern of activity is depicted in Figure 3. Based on patterns of similar activity it was determined the following electrodes could be clustered together. The right parietal cluster consisted of the P6, P08, and P8 electrodes. The left parietal cluster consisted of the P5, P7, and PO7 electrodes. The right frontal cluster consisted of

the F4, F6, and FC4 electrodes. Finally, the left frontal cluster consisted of the F3, F5, and FC3 electrodes. The time windows were created through an examination of the grand average to determine the starting location of the P300 and the overall duration of the LPP.

The overall purpose of the ERP analysis was to examine the patterns of neural activity associated with the preference for decision consistent information. However, according to behavioral data participants failed to exhibit the congeniality bias when responding to traits within the Smith vignette (*M* = -0.52). Therefore, experimental trials involving the Smith vignette were excluded from the analysis

Results of the analysis revealed a significant interaction between cortical hemisphere and cortical cluster, $F(1, 20) = 7.03$, $p < .05$, $\eta_p^2 = .26$. Simple effects analyses revealed no significant effect of hemisphere within the frontal cluster, $F(1, 20) = 1.79$, $p > .05$, $\eta_p^2 = .08$. However, there was a significant effect of hemisphere within the parietal cluster, $F(1, 20) = 4.60$, $p < .05$, $\eta_p^2 = .18$, such that the mean amplitude observed in the right hemisphere (*M* =2.71 μV, *SD* = 0.61) was significantly greater than the mean amplitude observed within the left hemisphere (*M* = 1.61 μV, *SD* = 0.71). Overall, this suggests that equal amounts of cognitive resources were devoted to processing decision consistent information within the frontal and parietal regions. However, decision inconsistent information obtained a clear processing advantage within the parietal region.

Most importantly, the expected four-way interaction between information consistency, cortical hemisphere, cortical cluster, and time window approached statistical significance, $F(4, 80) = 2.36$, $p = .06$, $\eta_p^2 = .11$. A cursory examination, revealed a pattern of results consistent with our expectations. Specifically, results revealed enhanced LPP amplitudes within the parietal region of the right hemisphere during the initial consideration of decision relevant information.

Furthermore, results suggested that after the initial consideration of decision relevant information participants devoted substantial amounts of neural resources to processing decision consistent information throughout the duration of the LPP. Supplementary data from the Primary ERP analysis can be found in Appendix C.

Data Analysis Including Only Those Participants Demonstrating the Congeniality Bias

Because the expected four-way interaction approached statistical significance, a follow-up analysis was conducted to determine if the presence of the congeniality bias influenced the observed patterns of neural activity. As before, a within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), cortical cluster (Frontal/Parietal) and time window (300-400, 400-500, 500-600, 600-700,700-800) as factors. However, only those participants (*N* = 11) who demonstrated the congeniality bias, defined as possessing a positive difference score after selecting between decision consistent/decision inconsistent traits. Including only these participants resulted in a congeniality bias score significantly different from zero (*M* = 15.72, *SD* = 22.32; *t*(10) = 2.33, *p* = .04, *d* = .70).

Results of the analysis revealed a main effect of information consistency such that participants exhibited greater mean amplitudes while processing decision consistent information (*M* = 3.53 μV, *SD* = 1.04) compared to decision inconsistent information (*M* = 1.63 μV, *SD* = 0.77), $F(1, 10) = 7.52$, $p < .05$, $\eta_p^2 = .42$.

Most importantly, results revealed the expected four-way interaction between information consistency, cortical hemisphere, cortical cluster, and time window, $F(4, 40) = 2.89$, $p < .05$, $\eta_p^2 = .22$. To explore the significant four-way interaction a series of ANOVA's were conducted to determine the effects of information consistency, cortical cluster, and cortical hemisphere within

each of the identified time windows. Supplementary data from the analysis containing only those demonstrating the congeniality bias can be found in Appendix C.

Follow-up Analyses for the 300 - 400 ms Time Window. A within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), and cortical cluster (Frontal/Parietal) as factors for the 300-400 ms time window.

Results of the analysis revealed a marginally significant interaction between cortical hemisphere and cortical cluster $F(1, 10) = 3.77$, $p = .08$, $\eta_p^2 = .27$. An examination of the interaction revealed greater neural activity was observed in the parietal regions while processing decision relevant information. Additionally, an examination of the interaction graph revealed the mean amplitude in the right hemisphere of the parietal region ($M = 5.87$ µV, $SD = 0.90$) was greater than in the left hemisphere of the parietal region ($M = 4.59$ µV, $SD = 1.11$).

Follow-up Analyses for the 400 - 500 ms Time Window. A within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), and cortical cluster (Frontal/Parietal) as factors for the 400 - 500 ms time window.

Results revealed a marginally significant effect of information consistency such that participants exhibited greater mean amplitudes while processing decision consistent information ($M = 2.60$ µV, $SD = 1.27$) compared to decision inconsistent information ($M = 0.34$ µV, $SD = 1.12$) during the 400 – 500 ms time window, $F(1, 10) = 4.34$, $p = .06$, $\eta_p^2 = .30$.

Notably, results also revealed a marginally significant 3-way interaction between information consistency, cortical hemisphere, and cortical cluster, $F(1, 10) = 3.68$, $p = .08$, $\eta_p^2 = .26$, . Simple effects analyses revealed a significant effect of information consistency within the

left hemisphere of the frontal cluster, $F(1, 10) = 6.54$, $p < .05$, $\eta_p^2 = .39$, such that the mean amplitude observed when processing decision consistent information ($M = 2.51$ μV, $SD = 1.84$) was significantly greater than when processing decision inconsistent information ($M = -0.99$ μV, $SD = 1.63$). This finding suggests decision consistent information gained a processing advantage within the left hemisphere of the frontal cluster during the 400 – 500 ms time window. Results are displayed in Figures 4a and 4b.

Follow-up Analyses for the 500-600 ms Time Window. A within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), and cortical cluster (Frontal/Parietal) as factors for the 500-600 ms time window.

Results revealed a main effect of information consistency suggesting more cognitive resources were devoted to processing decision consistent information ($M = 3.52$ μV, $SD = 1.15$) compared to decision inconsistent information during the 500 – 600 ms time window ($M = 1.28$ μV $SD = 0.91$), $F(1, 10) = 8.46$, $p < .05$, $\eta_p^2 = .45$.

The main effect of information consistency was qualified by a significant information consistency by cortical hemisphere interaction, $F(1, 10) = 6.70$, $p < .05$, $\eta_p^2 = .40$. Simple effects analyses revealed a significant effect of cortical hemisphere when processing decision consistent information, $F(1, 10) = 8.29$, $p < .05$, $\eta_p^2 = .45$, such that when processing decision consistent information, the mean amplitude observed in the left hemisphere ($M = 4.02$ μV, $SD = 1.30$) was significantly greater than within the right hemisphere ($M = 3.01$ μV, $SD = 1.01$). However, when processing decision inconsistent information, there was no significant difference in mean amplitude between the left ($M = 1.22$ μV, $SD = 0.99$) and right ($M = 1.34$ μV, $SD = 0.85$) hemispheres.

Follow-up Analyses for the 600-700 ms Time Window. A within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), and cortical cluster (Frontal/Parietal) as factors for the 600-700 ms time window.

Results of the analysis revealed a main effect of information consistency suggesting greater amounts of cognitive resources were devoted to processing decision consistent information (*M* = 4.34 μV, *SD* = 1.01) compared to decision inconsistent information (*M* = 2.33 μV, *SD* = 0.77), during the 600 – 700 ms time window, $F(1, 10) = 12.92$, $p < .05$, $\eta_p^2 = .56$.

Follow-up Analyses for the 700-800 ms Time Window. A within-subjects ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), and cortical cluster (Frontal/Parietal) as factors for the 700-800 ms time window.

Results of the analysis revealed a main effect of information consistency suggesting participants exhibited greater mean amplitudes while processing decision consistent information (*M* = 3.60 μV, *SD* = 0.85) compared to decision inconsistent information (*M* = 1.41 μV, *SD* = 0.61), $F(1, 10) = 10.62$, $p < .05$, $\eta_p^2 = .51$. Supplementary data from the follow-up analysis can be found in Appendix C.

Examination of Miller and Williams Data For Those Not Demonstrating the CB

To determine if the expected pattern of results were associated with the congeniality bias, follow-up analyses were conducted for those who failed to demonstrate a preference for decision consistent information, defined as possessing a negative difference score after selecting between decision consistent/decision inconsistent traits. Including only these participants resulted in an

average congeniality bias score that was significantly different from zero (M = -14.80, SD = 16.17; $t(9)$ = -2.89. p = .01, d = 0.91).

A repeated measures ANOVA was conducted with information consistency (Decision Consistent/Inconsistent Trait), cortical hemisphere (Left/Right), cortical cluster (Frontal/Parietal) and time window (300-400, 400-500, 500-600, 600-700,700-800) as within subject factors for those who failed to demonstrate the congeniality bias within the Miller and Williams vignettes.

Critically, the previously observed 4-way interaction between information consistency, cortical hemisphere, cortical cluster, and time window failed to reach statistical significance, $F(4, 36) = 0.83$, $p > .05$, $\eta_p^2 = .08$, among participants who did not exhibit the congeniality bias during the behavioral task. Supplementary data from the analysis containing those that did not demonstrate the congeniality bias can be found in Appendix C.

Discussion

Previous research has suggested individuals demonstrate a moderate preference for decision consistent information known as the congeniality bias (Hart et al., 2009). Several potential explanations have been proposed to explain why individuals exhibit a systematic preference for decision consistent information. Some suggest the bias results from a desire to avoid feelings of cognitive dissonance while others suggest the bias results from the difficulty associated with processing decision inconsistent information (Hart et al., 2009; Fischer & Greitemeyer, 2010). Recent advances in physiological measurement have provided researchers with new avenues to investigate the neural processes involved in the congeniality bias. Therefore, the purpose of the current study was to examine the neural underpinnings of the congeniality bias.

Before considering if the results of current study support the stated hypotheses, it is vital to consider the theoretical progression of the statistical analyses that were conducted. Behavioral data revealed experimental trials related to the Smith vignette failed to produce the congeniality bias. Therefore, trials related to the Smith vignette were excluded from ERP data analysis. After removing trials involving the Smith vignette, the expected patterns of results approached statistical significance. Based on the observed pattern of results, additional analyses were conducted to determine if the presence of the congeniality bias influence the observed patterns of neural activity.

When focusing on participants who demonstrated the congeniality bias, statistical analyses revealed the expected pattern of results. To ensure the expected results were associated with the congeniality bias, an additional analysis was conducted for those who failed to demonstrate the congeniality bias during the experimental procedure. Notably, this analysis failed to produce the expected pattern of results. Therefore, interpretation will focus on data collected from participants who demonstrated the congeniality bias during the experimental procedure.

The first hypothesis, that individuals will exhibit a preference for decision consistent information received mixed support. Behavioral data suggested participants displayed a slight preference for decision consistent information throughout the experimental procedure. However, statistical analyses revealed the amount of the preference did not significantly differ from zero.

The second hypothesis, that enhanced LPP amplitudes would be observed within the parietal regions of right hemisphere with the greatest enhancement occurring for decision inconsistent information, received mixed support. Consistent with our expectations, results revealed that participants exhibited enhanced mean amplitudes approximately 300 - 400 ms after

stimulus onset within the parietal regions of the brain. Additionally, consistent with our expectations we observed a right lateralization of neural activity within the parietal region during the experimental procedure among individuals demonstrating the congeniality bias. However, contrary to our expectations, we failed to observe enhanced laterality within the right hemisphere of the parietal region for decision inconsistent information.

The third hypothesis, that exposure to decision consistent information will elicit greater mean amplitudes throughout the duration of the LPP was supported. Consistent with expectations, our results revealed that approximately 400 ms after stimulus onset decision consistent information obtained a processing advantage in the left hemisphere of the frontal region. Furthermore, results suggest that approximately 500 ms after stimulus onset decision consistent information obtained a processing advantage within the entire left hemisphere. Finally, results suggest that approximately 600 ms after stimulus onset decision consistent information obtained a global processing advantage that persisted throughout the duration of the LPP.

When considered as a whole, the results of the current study provide an interesting overview of the neural processes involved in the congeniality bias. For example, the current study suggests the congeniality bias is associated with greater activity in the right parietal regions of during the initial consideration of decision relevant information. As suggested in previous examinations, activity in the right parietal regions may be attributable to the processes involved in the categorization of motivationally significant stimuli (Cacioppo et al., 1996). Therefore, within the confines of the procedure, enhanced LPP amplitudes within the right parietal region could reflect the categorization of information as consistent or inconsistent with the preliminary decision made within each vignette.

Furthermore, our results suggest the congeniality bias is associated with an increased devotion of neural resources to the processing of decision consistent information. Specifically, it seems that after the initial consideration of decision relevant information, occurs decision consistent information obtains a processing advantage within left cortical regions. This finding is not surprising considering the role of the left hemisphere in attitudes and belief updating. For example, research has suggested the left hemisphere is responsible for maintaining currently held beliefs about the world (Gazzaniga, 1998). Therefore, enhanced activation to decision consistent information within the left hemisphere may reflect the desire to processes information in a manner that is consistent with prior beliefs. Finally, the left hemisphere processing advantage slowly transitions to a global advantage throughout the duration of the LPP suggesting individuals devote a substantial amount of cognitive resources to processing decision consistent information during the decision making process.

The observed results have several interesting implications regarding our understanding of the congeniality bias. First, our findings provide insight into the patterns of neural activity associated with the congeniality bias. Most notably, the current study clearly supports the role of a defensive motivation in the congeniality bias. Festinger's (1957) original conceptualization of dissonance theory suggests the congeniality bias is driven by a defensive motivation to avoid feelings of cognitive dissonance. Specifically, dissonance theory predicts individuals will seek out decision consistent information while avoiding decision inconsistent information to maintain cognitive consistency (Festinger, 1957). Our results support this interpretation by suggesting that individuals devote greater amounts of cognitive resources to processing decision consistent information during the decision making process.

Additionally, the observed results have interesting implications for efforts designed to reduce the congeniality bias. Recent research has suggested the fluency of a message, or the ease of processing, can influence the strength of the congeniality bias. Specifically, examinations have that found experiencing processing difficulty during the decision making process often reduces the strength of the congeniality bias by promoting a critical (more effortful) examination of presented information (Hernandez & Preston, 2013). Based on the results of the current study, disfluency, or experiencing processing difficulty, may promote a more balanced evaluation of information by directing cognitive resources to decision inconsistent information. Therefore, it seems it may be possible to reduce the congeniality bias by altering the features of a message to promote disfluency among pieces of decision inconsistent information.

There were several strengths present in the current study. The first is the inclusion of a behavioral measure of the congeniality bias. This addresses a weakness found in the only other examination of the neurophysical correlates of the congeniality bias to date which relied on passive exposure to information during EEG recordings (Fischer et al., 2013). The inclusion of a behavioral measure of the congeniality bias increases confidence the observed patterns of neural activity were associated with the preference for decision consistent information and were not an artifact of the recording methods employed.

Furthermore, a major strength of the study is associated with the pretesting of the trait words that were presented to participants. The stimuli used in the current study were taken from Anderson's (1968) list of personality trait words. Participants in Anderson's original examination evaluated each of the traits on several dimensions including their likableness, or favorability. Based on the observed results, Anderson identified a subset of trait terms that could be particular useful in future examinations. However, before the identified traits were used in the current

examination, a pretest was conducted to ensure contemporary participants viewed the trait words similarly.

There were also several limitations present in the current study. A major limitation was the inability of our behavioral measure to effectively detect the presence of the congeniality bias. Our results suggested participants exhibited a slight preference for congenial information but this preference failed to reach statistical significance. The inability to demonstrate a significant preference is disheartening as the congeniality bias is a robust effect that has been repeatedly demonstrated within numerous empirical examinations (Hart et al., 2009).

There are several potential explanations as to why our behavioral measure was not as sensitive to the congeniality bias as traditional measures. A primary factor may involve the large of amount of information that was presented to participants. Previous examinations have suggested the strength of the congeniality bias is influenced by the amount of information that is presented. For example, Fischer, Schulz-Hardt, and Frey (2008) found the strength of the congeniality bias increased with the amount of information that was presented (Fischer, Schulz-Hardt, & Frey, 2008). However, studies investigating the influence of information quantity on the congeniality bias often expose participants to a rather limited amount of information. This is in stark contrast to the current study during which participants were asked to select from 450 pieces of additional information. Therefore, asking participants to repeatedly select between large amounts of decision relevant information may increase the likelihood they will notice bias in their information selection, leading to a more balanced selection strategy.

Another potential limitation of the current study is associated with the artificial nature of the situation. Specifically, participants were asked to wear a tight cloth cap and electrodes that were fixed in place using a non-toxic gel. It is highly possible the experimental situation may

have been uncomfortable and anxiety provoking for the participants involved. Given the potential role of cognitive dissonance in the congeniality bias, feelings of discomfort during the experimental procedure may have interfered with the production of dissonance effects. As noted in previous research, cognitive dissonance is a drive-like state possessing arousal properties (Festinger, 1957). Furthermore, research has suggested dissonance effects are often attenuated or eliminated when individuals are given the opportunity to attribute dissonance arousal to external factors (Zanna & Cooper, 1974). Therefore, individuals may have been less likely to seek out decision consistent information when they could attribute feelings of cognitive dissonance to the uncomfortable nature of the experimental situation.

The current study opens interesting avenues for future research. The current study suggests fluctuations in LPP amplitude elicited by exposure to decision relevant information are associated with the congeniality bias. Previous research has suggested fluctuations in LPP amplitude can serve as an indicator of attitude extremity with greater evaluative inconsistency effects being indicative of more extreme attitudes (Dhont et al., 2012). This is noteworthy, as previous research has suggested attitude strength can influence the strength of the congeniality bias. For example, Brannon, Tagler, and Eagly (2007) found the congeniality bias was more pronounced among individuals holding stronger attitudes. Therefore, future research could utilize measures of LPP amplitude as a physiological indicator of attitude strength to investigate if the strength of individuals' attitudes moderates the preference for decision consistent information.

Furthermore, the current study is the first to adapt traditional methods of measuring the congeniality bias for use within ERP paradigms. However, as noted previously, adapting traditional measures for use in the current study significantly weakened our ability to detect the congeniality bias. It is possible the behavioral measure failed to detect the congeniality bias

because the ERP paradigm did not permit the manipulation of variables shown to increase defensive motivation. For example, past research has shown individuals are more likely to exhibit a preference for decision consistent information when information has a high-perceived quality, when individuals are committed to an attitude, when information is believed to be relevant, when individuals exhibit high levels of close-mindedness, and attitude confidence is high. Therefore, future studies could examine if increasing the strength of defensive motivation would improve researchers' ability to detect the congeniality bias using behavioral measures within ERP investigations.

Conclusion

The current examination is the only study to date to utilize event related potential methodology to investigate the neural components of the congeniality bias. The results of the examination are largely consistent with previous research noting a right lateralized late positive potential during the initial consideration of motivationally significance stimuli. Furthermore, the current research suggests individuals demonstrating the congeniality bias devote greater amounts of attentional resources to processing information that is consistent with previous decisions. Notably, the findings support the role of a defensive motivation in the congeniality bias suggesting individuals seek out decision consistent information while neglecting decision inconsistent information to avoid the experience of cognitive dissonance.

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Appendix A

The following details a scenario regarding the possible contract extension of a fashion store manager. After reading the presented information you will be asked to make a preliminary decision regarding if Mr. Miller's contract should be extended or terminated.

Please imagine the following scenario: a close friend of yours inherited a local business and would like your advice regarding a decision dealing with an employee named Mr. Miller.

Mr. Miller is currently employed as the manager of a fashion store and was hired as the store manager with the understanding that at the conclusion of his one-year contract negotiations would occur regarding a possible contract extension.

The task of the newly hired manager was to make the store more attractive for customers while purchasing clothing at low prices to sell within the store. These tasks were considered to be important, as the products and the store image have not changed in several years.

The business, which employs 38 employees, has observed mix success during Mr. Miller's time as manager.

For Example:

- Mr. Miller was successful in bringing in new customers through promotional campaigns and the launching of the "Young Fashion" product line. Unfortunately existing customers were not pleased with the "Young Fashion" clothing line and the store had large stocks of product leftover at the end of the season.
- Mr. Miller's reconstruction of the store was also met with a mixed response. Some customers praised the modern redesign of the store while others criticized the design for being confusing and difficult to navigate.
- Several longtime employees have expressed concern with Mr. Miller's leadership style and as a result there have been several conflicts between employees and Mr. Miller, which led several employees to resign from their respective positions.
- Overall, the decisions made by Mr. Miller have not changed the financial situation of the business, as there were no significant profits or losses.

Please carefully consider the information that was presented regarding Mr. Miller's performance as store manager.

Based on the presented information please indicate if you believe Mr. Miller's contract should be extended or not.

Yes, Mr. Miller's contract should be extended.

No, Mr. Miller's contract should not be extended.

The following details a scenario regarding the possible contract extension of an assistant professor. After reading the presented information you will be asked to make a preliminary decision regarding if Professor Smith's contract should be extended or terminated.

Please imagine the following scenario: you have been asked by the Office of the Provost to provide your opinion regarding a decision involving a university employee named Professor Smith.

Professor Smith is currently employed as an assistant professor at a local university and was hired with the understanding that at the conclusion of his contract a performance evaluation would occur regarding possible contract extension and the granting of tenure.

The Office of Provost made it clear that Professor Smith's future performance evaluations would consider his teaching performance, research production, and contributions to the community.

The Office of the Provost notes that Professor Smith's performance has been mixed during his time at the university.

For Example:

- Professor Smith brings a unique teaching style to the classroom causing some students to flourish. However, Professor Smith's teaching style has been detrimental for those students who prefer a more traditional approach to teaching.
- During his time at the university Professor Smith has completed several research projects and has successfully submitted the results for publication. Unfortunately, Professor Smith has only found success publishing in low quality academic journals.
- Professor Smith has proposed several programs designed to assist disadvantaged youth but has not taken the steps necessary to implement these programs in the community.
- Overall, Professor Smith's performance does not clearly fall above or below the standards deemed necessary by the Office of the Provost for obtaining a tenured faculty position.

Please carefully consider the information that was presented regarding Professor Smith's performance as assistant professor.

Based on the presented information please indicate if you believe Professor Smith's contract should be extended or not

Yes, Professor Smith's contract should be extended.

No, Professor Smith's contract should not be extended.

The following details a scenario regarding the possible contract extension of a physician. After reading the presented information you will be asked to make a preliminary decision regarding if Dr. Williams' contract should be extended or terminated.

Please imagine the following scenario: you are a member of a hospital advisory board and have been asked to carefully consider the performance of a recently hired physician named Dr. Williams.

Dr. Williams is currently employed as a physician at a local hospital and was hired with the understanding that discussions would occur regarding a possible contract extension after a one-year probationary period.

All physicians are made aware that contract decisions are often based on medical knowledge, on the quality of care provided to patients, and on the quality of patient/doctor interactions.

The advisory board has obtained reports detailing positive and negative aspects of Dr. Williams' performance.

For Example:

- Dr. Williams' has demonstrated his medical knowledge by graduating medical school with numerous academic distinctions. However, there has been concern over Dr. Williams' failure to seek opportunities to learn about recent advances in the medical field.
- Dr. Williams has demonstrated the ability to diagnose difficult medical issues that have baffled other physicians. Unfortunately, Dr. Williams has misdiagnosed some common ailments resulting in unneeded treatment for several of his patients.
- Dr. Williams adopts a no-nonsense approach when interacting with patients. Some patients enjoy Dr. Williams' approach and have recommended the hospital to others for their medical care. Yet some patients have expressed concern regarding how Dr. Williams' interacts with patients causing them to seek medical care elsewhere.
- Based on the reports provided to the advisory board Dr. Williams does not seem to exceed or fall below the performance standards set by the hospital.

Please carefully consider the information that was presented regarding Dr. Williams performance as a physician.

Based on the presented information please indicate if you believe Dr. Williams contract should be extended or not.

Yes, Dr. Williams contract should be extended.

No, Dr. Williams contract should not be extended.

Appendix B

1. Trustworthy
2. Loyal
3. Truthful
4. Trustful
5. Humorous
6. Reliable
7. Friendly
8. Honest
9. Sincere
10. Kind
11. Understanding
12. Dependable
13. Happy
14. Considerate
15. Easygoing
16. Courteous
17. Responsible
18. Helpful
19. Polite
20. Forgiving
21. Thoughtful
22. Amusing
23. Ambitious
24. Generous
25. Well-mannered
26. Patient
27. Pleasant
28. Cheerful
29. Outgoing
30. Intelligent
31. Unselfish
32. Enthusiastic
33. Cooperative
34. Warm
35. Sociable
36. Attentive
37. Clever
38. Excited
39. Relaxed
40. Efficient
41. Energetic
42. Creative
43. Imaginative
44. Capable
45. Sensible
46. Independent
47. Calm
48. Observant
49. Punctual
50. Logical
51. Confident
52. Witty
53. Tolerant
54. Practical
55. Talented
56. Neat
57. Tidy
58. Talkative
59. Sentimental
60. Self-reliant
61. Broadminded
62. Prompt
63. Self-confident
64. Curious
65. Studious
66. Careful

67. Competent
68. Modest
69. Alert
70. Self-assured
71. Daring
72. Orderly
73. Obedient
74. Idealistic
75. Proud
76. Liar
77. Untrustworthy
78. Dishonest
79. Untruthful
80. Mean
81. Cruel
82. Rude
83. Distrustful
84. Ungrateful
85. Phony
86. Unkind
87. Unpleasant
88. Unfriendly
89. Irritating
90. Unreliable
91. Selfish
92. Greedy
93. Impolite
94. Hostile
95. Malicious
96. Angry
97. Discourteous
98. Unappreciative
99. Conceited
100. Prejudiced
101. Self-centered
102. Hot-tempered
103. Ill-mannered
104. Cold
105. Insincere
106. Complaining
107. Irresponsible
108. Irritable
109. Unsympathetic
110. Obnoxious
111. Short-tempered
112. Uninteresting
113. Narrow-minded
114. Boring
115. Disobedient
116. Overcritical
117. Egotistical
118. Gloomy
119. Unsociable
120. Faultfinding
121. Unhappy
122. Envious
123. Unattentive
124. Quarrelsome
125. Possessive
126. Sloppy
127. Unpunctual
128. Wasteful
129. Careless
130. Inconsistent
131. Boastful
132. Cowardly
133. Moody
134. Pessimistic
135. Overconfident

136. Unintelligent
137. Unemotional
138. Jealous
139. Depressed
140. Disagreeable
141. Nosey
142. Gossipy
143. Loudmouthed
144. Oversensitive
145. Lazy
146. Untidy
147. Unobservant
148. Unimaginative
149. Forgetful
150. Absentminded

Appendix C

Supplementary Data For ERP Primary Analysis

Results of the ERP primary data analysis revealed a main effect of time window, $F(4, 80) = 5.35$, $p < .05$, $\eta_p^2 =. 22$. Pairwise comparisons (with the Dunn-Sidak Correction) revealed a significant difference in mean amplitude between the 300 – 400 ms (*M* = 2.63 μV, *SD* = 0.62), and the 400 - 500 ms time windows (*M* = 0.87, *SD* = 0.66), $p = .002$, and between the 400 – 500 ms (*M* = 0.87, *SD* = 0.66), and 600 - 700 ms time windows (*M* = 2.27 μV, *SD* = 0.57), $p < .05$.

Results of the analysis also revealed a significant interaction between cortical hemisphere and time window, $F(4, 80) = 3.31$, $p < .05$, $\eta_p^2 = .14$. Simple effects analyses revealed a significant effect of cortical hemisphere within the 300 – 400 ms time window, $F(1, 20) = 6.93$, $p < .05$, $\eta_p^2 = .25$ such that the mean amplitude in the right hemisphere (*M* = 3.11 μV, *SD* = 0.59) was significantly greater than in the left hemisphere (*M* = 2.16 μV, *SD* = 0.70).

Additionally, results of the analysis revealed a significant interaction between time window and cortical cluster, $F(4, 80) = 11.99$, $p< .01$, $\eta_p^2 = .37$. Simple effects analyses revealed there was a significant effect of cortical cluster within the 300 – 400 ms time window, $F(1, 20) = 6.08$, $p < .05$, $\eta_p^2 = .23$. Mean amplitude observed within the parietal cluster (*M* = 3.90 μV, *SD* = 0.70) was significantly greater than that observed within the frontal cluster (*M* = 1.37 μV, *SD* = 0.90) during the 300 – 400 ms time window.

Finally, results of the ERP primary data analysis revealed a significant 3-way interaction between cortical cluster, cortical hemisphere, and time window, $F(4, 80) = 2.58$, $p < .05$, $\eta_p^2 = .11$. Simple effects analyses revealed there was a significant effect of cortical hemisphere within the frontal cluster for the 500 – 600 ms time window, $F(1, 20) = 4.42$, $p < .05$, $\eta_p^2 = .18$, such that within the frontal cluster the mean amplitude in the left hemisphere (*M* = 1.78 μV, *SD* =

0.98) was significantly greater than in the right hemisphere (*M* = 1.04 μV, *SD* = 0.84). Additionally, there was a significant effect of cortical hemisphere within the parietal cluster during the 300 – 400 ms time window such that the mean amplitude observed in the right hemisphere (*M* = 4.87 μV, *SD* = 0.72) was significantly greater than in the left hemisphere (*M* = 2.93 μV, *SD* = 0.79), $F(1, 20) = 10.87$, $p < .05$, $\eta_p^2 = .35$.

Supplemental Data For The Analysis Including Only Those Exhibiting the Congeniality Bias

Results of the analysis including only those demonstrating the congeniality bias revealed a main effect of time window, $F(4, 40) = 3.16$, $p < .05$, $\eta_p^2 = .24$. However, after correcting the type I error rate (with the Dunn-Sidak Correction) for multiple comparisons, follow-up analyses failed to produce any significant differences between the time windows.

Results also revealed a significant interaction between cortical cluster and time window, $F(4, 40) = 10.24$, $p < .05$, $\eta_p^2 = .50$. Simple effects analyses revealed a significant effect of cortical cluster within the 300 – 400 ms time window, $F(1, 10) = 7.14$, $p < .05$, $\eta_p^2 = .41$, and within the 400 – 500 ms time window, $F(1, 10) = 5.17$, $p < .05$, $\eta_p^2 = .34$. Mean amplitudes observed in the parietal cluster (*M* = 5.23 *SD* = 0.91) were significantly greater than mean amplitudes observed in the frontal cluster (*M* = 1.13*,* *SD* = 1.56) during the 300 – 400 ms time window, and also during the 400-500 ms time window (*M*s = 3.23 μV*,* -0.27 μV, *SD*s = 1.12, 1.49, respectively).

Additionally, results revealed a significant interaction between cortical hemisphere and time window, $F(4, 40) = 2.84$, $p <. 05$, $\eta_p^2 = .22$. Simple effects analyses revealed a marginally significant effect of cortical hemisphere within the 400 – 500 ms time window, $F(1, 10) = 3.80$, $p = .08$, $\eta_p^2 = .27$, such that the mean amplitude observed in the left hemisphere (*M* = 1.92 μV, *SD*

= 1.14) was significantly greater than observed within the right hemisphere (*M* = 1.02 µV, *SD* = 1.04). No effects of cortical hemisphere were evident at the other time windows.

Finally, results revealed a significant interaction between cortical hemisphere and cortical cluster, $F(1, 10) = 7.72$, $p < .05$, $\eta_p^2 = .43$. Simple effects analyses revealed that within the frontal cluster the mean amplitude in the left hemisphere (*M* = 2.24 µV, *SD* = 1.17) was significantly greater than the mean amplitude observed in the right hemisphere (*M* = 1.13 µV, *SD* = 1.06), $F(1, 10) = 14.95$, $p < .05$, $\eta_p^2 = .59$. However, there were no significant effects of cortical hemisphere within the parietal cluster, $F(1, 10) = 1.34$, $p < .05$, $\eta_p^2 = .11$ with no significant differences between the mean amplitude for the right (*M* = 3.79 µV, *SD* = 0.82) and left (*M* = 3.16 µV, *SD* = 1.08) hemispheres.

Supplemental Data for the 300 - 400 ms Time Window Follow-up Analyses

Results of the follow-up analysis for the 300 – 400 ms time window revealed a main effect of cortical cluster such that the mean amplitude in the parietal region (*M* = 5.23 µV, *SD* = 0.91) was significantly greater than in the frontal region (*M* = 1.13 µV, *SD* = 1.56), $F(1, 10) = 7.14$, $p < .05$, $\eta_p^2 = .41$.

Supplemental Data for the 400 - 500 ms Time Window Follow-up Analyses

Results of the the follow up analysis for the 400 – 500 ms time window revealed a main effect of cortical cluster such that the mean amplitude in the parietal region (*M* = 3.23 *SD* = 1.12) was significantly greater than within the frontal region (*M* = -0.27 µV, *SD* = 1.49), while processing decision relevant information, $F(1, 10) = 5.17$, $p < .05$, $\eta_p^2 = .34$.

Additionally, results revealed a significant interaction between cortical hemisphere and cortical cluster, $F(1, 10) = 5.75$, $p < .05$, $\eta_p^2 = .37$. Simple effects analyses revealed a significant effect of cortical hemisphere within the frontal cluster, $F(1, 10) = 22.81$, $p < .05$, $\eta_p^2 = .69$, such

that within the frontal region, the mean amplitude observed within the left hemisphere (*M* = 0.76 μV, *SD* = 1.60) was significantly greater than within the right hemisphere (*M* = -1.31 μV, *SD* = 1.40). However, within the parietal cluster there was no significant difference in mean amplitude between the left (*M* = 3.09 μV, *SD* = 1.31) and right (*M* = 3.37 μV, *SD* = 1.07) hemispheres.

Follow-up Analyses for the 500-600 ms Time Window

Results from the follow-up analysis for the 500 – 600 ms time window revealed a significant cortical hemisphere by cortical cluster interaction, $F(1, 10) = 8.76, p < .05, \eta_p^2 = .46$. Simple effects analyses revealed a significant effect of cortical hemisphere within the frontal cluster, $F(1, 10) = 19.49, p = < .05, \eta_p^2 = .66$, such that within the frontal cluster, the mean amplitude observed within the left hemisphere (*M* = 2.48 μV, *SD* = 1.28) was significantly greater than within the right hemisphere (*M* = 1.02 μV, *SD* = 1.04). Additionally, within the parietal cluster there was no significant difference in mean amplitude between the left (*M = 2*.76 μV, *SD* = 1.28) and right (*M* = 3.33 μV, *SD* = 1.00) hemispheres during the 500 – 600 ms time window.

Follow-up Analyses for the 600-700 ms Time Window

Results of the follow-up analysis for the 600 – 700 ms time window revealed a significant cross-over interaction between cortical hemisphere and cortical cluster, $F(1, 10) = 5.24, p < .05, \eta_p^2 = .34$, such that within the frontal regions, the mean amplitude within the left hemisphere (*M* = 3.63 μV, *SD* = 0.96), was greater than in the right hemisphere (*M* = 3.02 μV, *SD* = 0.97). Additionally, within the parietal regions, the mean amplitude within the right hemisphere (*M* = 3.72 μV, *SD* = 0.86) was greater than the mean amplitude in the left hemisphere (*M* = 2.99 μV, *SD* = 1.13).

Examination of Miller and Williams Data For Those Not Demonstrating the CB

Results of the examination for those not demonstrating the congeniality bias revealed a main effect of time window, $F(4, 36) = 2.83$, $p < .05$, $\eta_p^2 = .23$. However, after correcting the type I error rate (with the Dunn-Sidak Correction) for multiple comparisons the follow-up analyses failed to produce any significant differences between the analyzed time windows.

Additionally, results revealed a significant cortical cluster by time window interaction, $F(4, 36) = 2.97$, $p < .05$, $\eta_p^2 = .24$. Unfortunately, simple effects analyses failed to reveal the nature of the interaction between the factors.

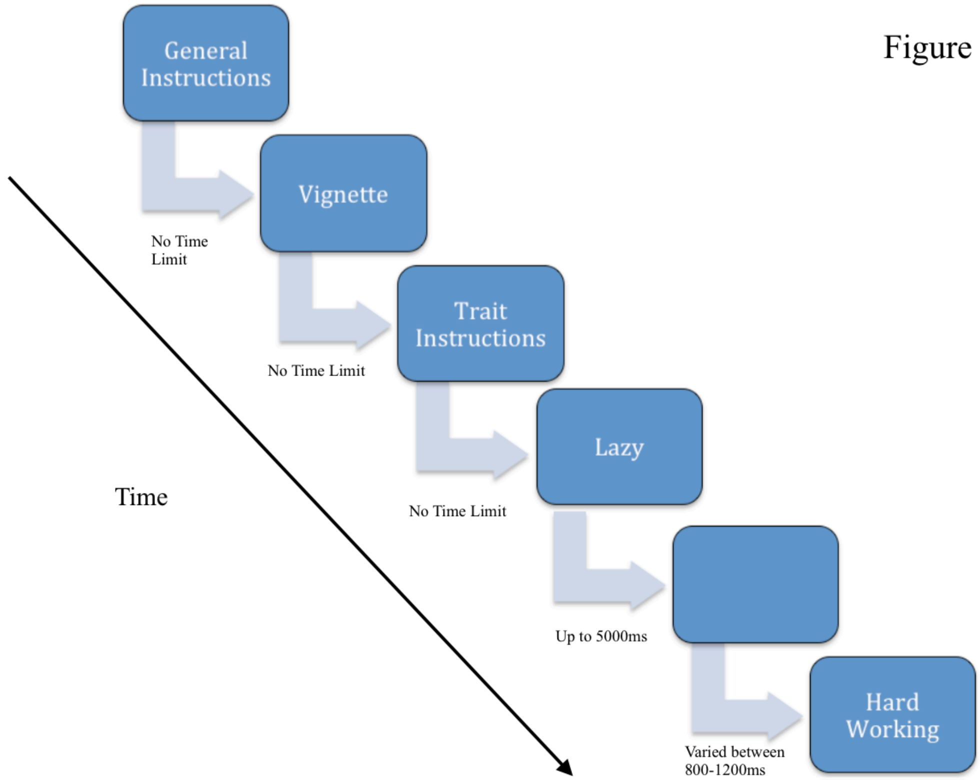

Figure 1.

Figure 1. Schematic of experiment procedure. At the beginning of each block, participants were shown instructions followed by a randomly selected vignette, which appeared for an unlimited amount of time. The vignette detailed positive/negative aspects of the chosen individuals job performance. Participants made a preliminary decision regarding the potential extension/termination of the chosen individuals employment contract at the conclusion of the vignette. Following the preliminary decision, participants were shown positive and negative trait words related to specific aspects of the individuals job performance. For each trait, participants were instructed to indicate (yes/no) if they would like to receive more information detailing how the individual demonstrates the presented personality trait in their position of employment. Traits words appeared for a maximum of 5000ms. The presentation of each trait word was followed by a interstimulus interval ranging between 800-1200ms.

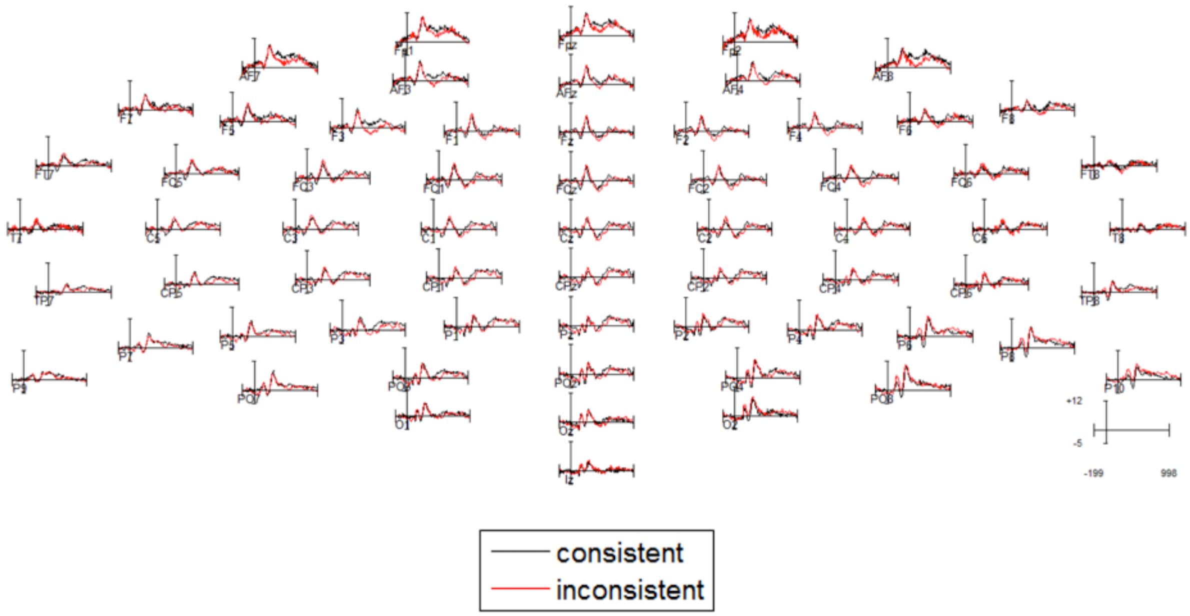

Figure 2. A visual depiction of the ERP grand average. Amplitudes represent the mean level of neural activity elicited by exposure to decision consistent and decision inconsistent information. Greater amplitudes reflect a greater devotion of cognitive resources to processing decision relevant information.

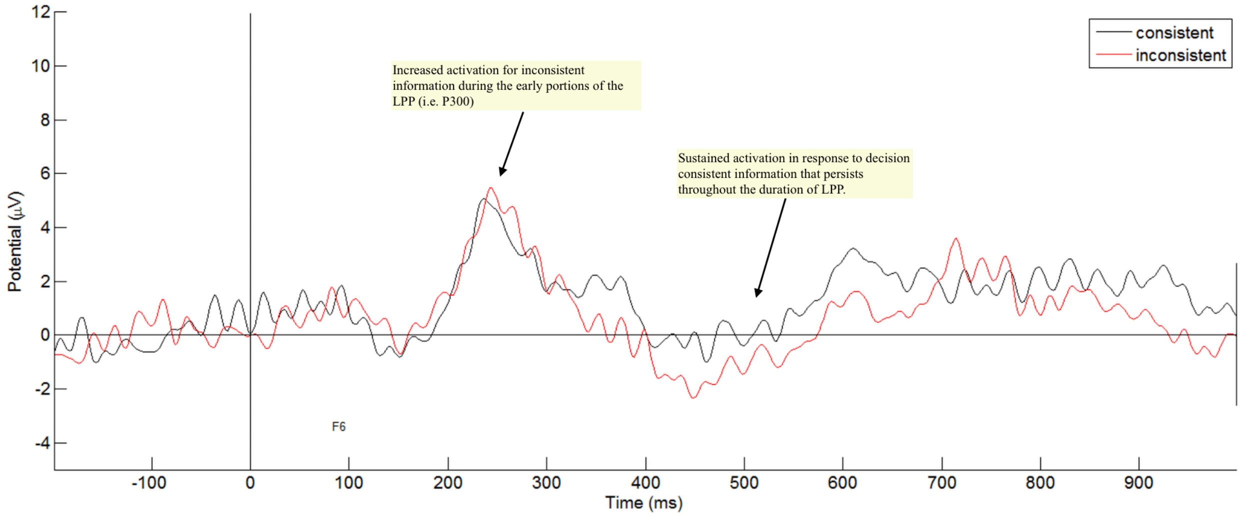

Figure 3. The visual depiction of the patterns of neural activity observed in clustered electrodes. Electrodes selected for clustering demonstrated increased amplitudes for decision inconsistent information during the early portions of the LPP waveform. Additionally, electrodes selected for clustering demonstrated sustained positivity for decision consistent information that persisted throughout the duration of the LPP waveform.

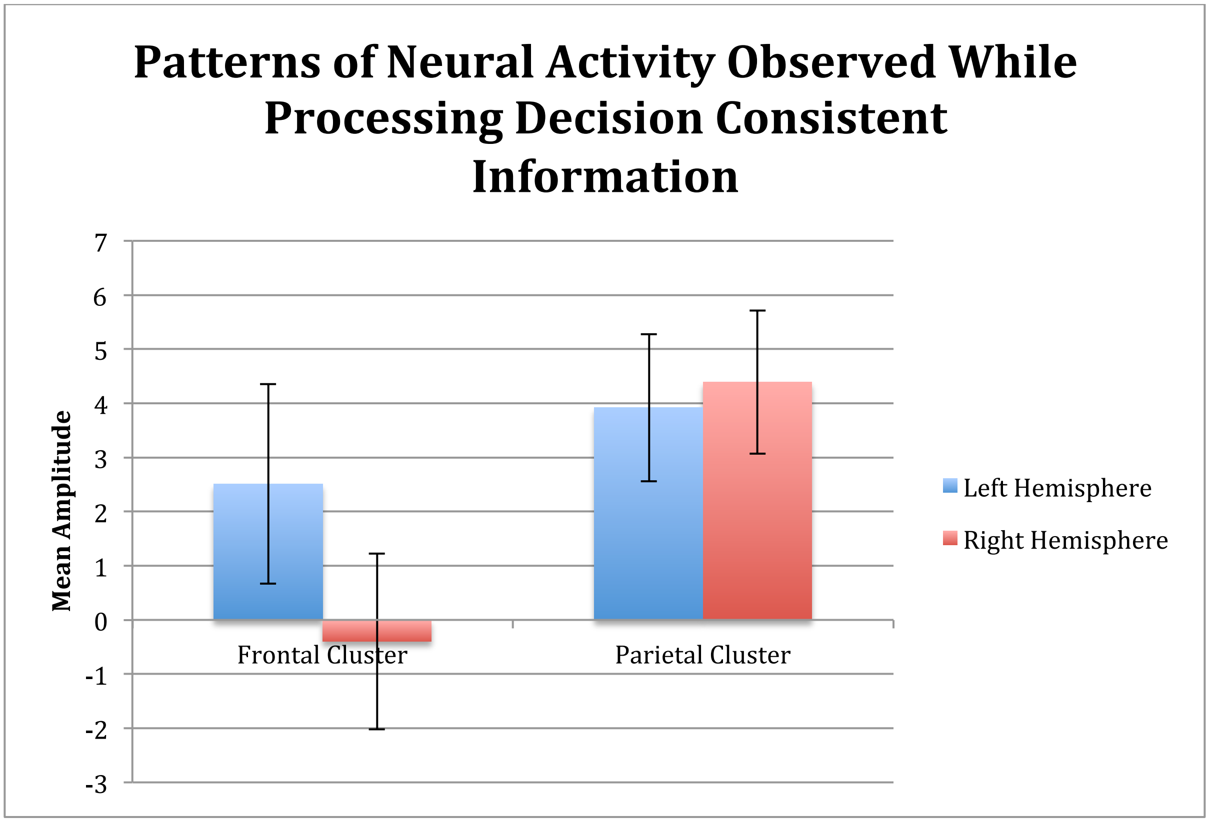

Figure 4a. Relationship between cortical hemisphere and cortical cluster when processing decision consistent information. Error bars represent standard errors.

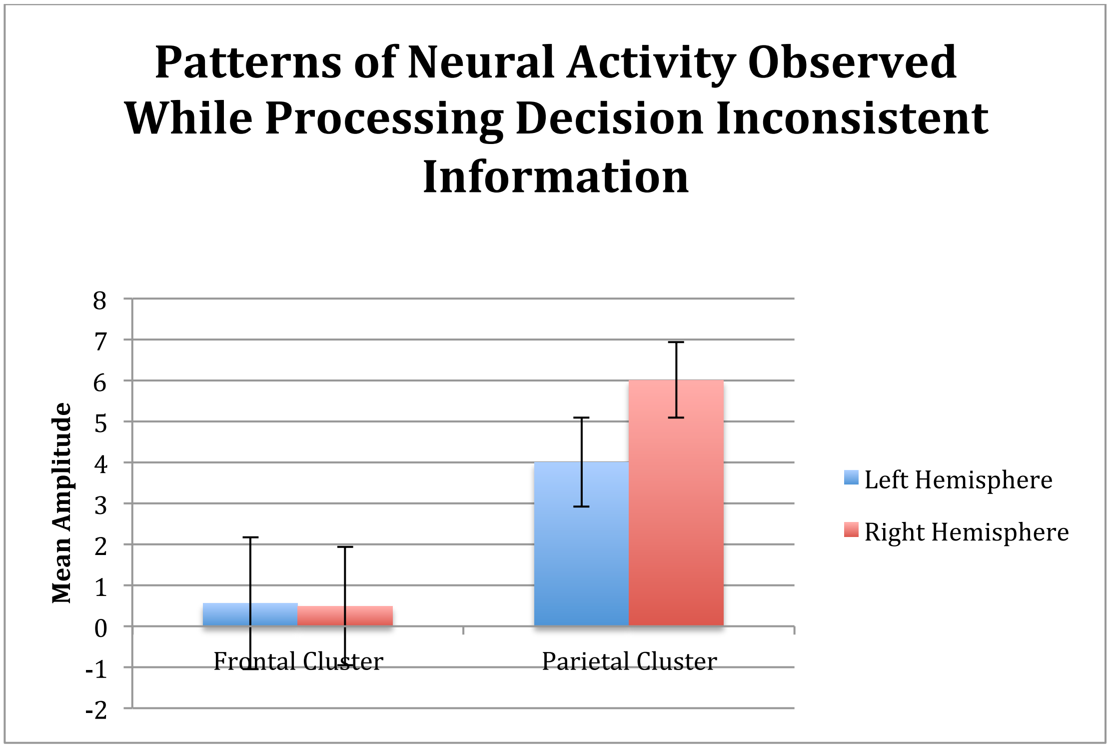

Figure 4b. Relationship between cortical hemisphere and cortical cluster when processing decision inconsistent information. Error bars represent standard errors.