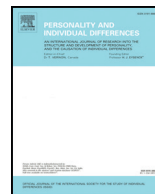




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Chronic accessibility of academic stimuli: Conscientiousness, extraversion, neuroticism

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ABSTRACT

Previous research on relationships between Big Five traits and how readily a concept comes to mind (chronic accessibility; CA) has produced inconsistent findings, which may be partly due to the use of concepts that are not relevant to participants. As such, this study used academic-related stimuli that would be personally relevant to the 85 first-year university participants. A lexical decision task was used to investigate the relationship between conscientiousness, neuroticism, and extraversion for the CA of academic-approach, academic-avoidance, performance-evaluative, or academic-neutral words. Extraversion had a positive and neuroticism a negative correlation with CA of academic-approach words. Conscientiousness had a positive correlation with CA of academic-neutral words. There was no correlation between neuroticism and CA of academic-avoidance words, however week of the semester was a significant moderator, indicating that the relationship between neuroticism and CA of concepts may be sensitive to situational contexts.

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1. Introduction

In social-cognitive perspectives on personality, the chronic accessibility (CA) of concepts is often suggested as one of the cognitive-affective processes that leads to individual differences in behaviour (Higgins & Scholer, 2008). The accessibility of a concept refers to how easily that concept is retrieved and activated. Temporary accessibility may come from situational primes or temporary goals. With regular activation, that concept may become *chronically* accessible to an individual, with the accessibility of these concepts existing beyond temporary goals or environmentally-primed concepts (Higgins & Scholer, 2008).

In contrast to the social-cognitive focus on within-person processes, trait-based personality researchers typically focus on differences *between* people, and use descriptions of traits like the Big Five to predict outcomes (Fleeson, 2012). Recently, researchers have recognised the utility of incorporating trait perspectives on personality with social-cognitive processes such as CA, in order to gain a better understanding of the mechanisms involved in traits and trait manifesting behaviour (Fleeson, 2012).

Several studies have investigated Big Five traits and CA of trait-congruent stimuli. Robinson (2007) suggested that although multiple studies had been conducted with colleagues, no evidence was found for a correlation between the CA of positive concepts and extraversion, negative concepts and neuroticism, or hostile concepts and agreeableness. In contrast, Borkenau, Paelecke, and Yu (2010) found that

extraversion was associated with the CA of positive concepts, though they still did not find an association between neuroticism and the CA of negative concepts.

Part of the reason for the different results found for extraversion may be due to the tasks used to measure CA. For instance, Borkenau et al. (2010) used a timed lexical decision task (where participants were instructed to respond if the word on the screen was a word or non-word). In contrast, Tamir, Robinson, and Clore (2002) used a timed categorisation task (where the participants were instructed to classify the word as something they would or would not want). It is possible that the lack of direct relationship between extraversion and positive words in Tamir et al.'s (2002) study was due to the categorisation task being a less valid or reliable measure of CA than the lexical decision task. However, this still does not explain the consistent lack of results found for neuroticism.

One possible explanation for the nonsignificant results for neuroticism can be provided by considering the influence of concept relevance. CA of concepts is caused by either repeated contextual activation, or long term beliefs or goals (Higgins & Scholer, 2008). As such, for a concept to become chronically accessible to an individual, it has to be *relevant* enough for repeated activation, either through experience, or belief- or goal-activation. The negative stimuli used in Borkenau et al.'s study (e.g., tumour, bomb; 2010) may have had little personal relevance to the student participants in their study. In other words, people high in neuroticism may have a greater CA of negative concepts, but only those that are personally-relevant enough for repeated activation. Some evidence for this is provided by Chan, Goodwin, and Harmer (2007), who found that when instructed to think of positive and

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negative personality–trait stimuli as self-referent descriptors, neuroticism was associated with faster responding to negative compared to positive personality traits in a categorisation task.

Consequently, this study was designed to test whether CA of personally-relevant stimuli is associated with conscientiousness, extraversion, and neuroticism. For first year university students, university-related stimuli should be personally-relevant. To ensure comparability, this study used the lexical decision task from Borkenau et al.'s (2010) study to assess four types of academic stimuli and matched neutral control-nonacademic stimuli: academic-approach words (e.g., success, brilliant), academic-avoidance words (e.g., fail, idiot), performance-evaluative words (e.g., assignment, grade), academic-neutral words (e.g., university, textbook), and the control-nonacademic words (e.g., century, table). As with previous studies, neuroticism was expected to be correlated with negative stimuli (academic-avoidance words), and extraversion with positive stimuli (academic-approach words). Though conscientiousness is the strongest personality predictor of academic performance (Poropat, 2009), no studies have investigated the relationship between conscientiousness and CA. As such, although we expected that conscientiousness would be related to CA of academic-related stimuli, no category-specific relationships were predicted. Week of semester was included as a moderator for the predicted relationships in order to assess potential trait by situation effects.

2. Method

2.1. Participants

Participants were 85 first year undergraduate psychology students, who gained partial course credit for participation. The age range was 16 to 40 ($M = 19.36$, $SD = 4.10$), and 67 were female. Informed consent was obtained from participants.

2.2. Measures

2.2.1. Week of semester

The week of the semester when participants completed the experiment was recorded.

2.2.2. Personality

Neuroticism and extraversion were each measured by 10 items of the IPIP version of the NEO-FFI (Goldberg, 1999). As conscientiousness has a stronger relationship with academic performance (Poropat, 2009) and in order to investigate potential differences in conscientiousness facets (orderliness, self-efficacy, dutifulness, achievement striving, self-discipline, cautiousness), conscientiousness was measured by the 60 conscientiousness items of the IPIP NEO-PI-R (Goldberg, 1999). Internal consistency was .77 for neuroticism, .88 for extraversion, and .93 for conscientiousness. Internal consistency ranged from .71 (dutifulness) to .84 (self-discipline) for conscientiousness facets.

2.2.3. Lexical decision task

Lists of words, descriptions of traits, and thesauruses were used to find target words. Seventy-nine candidate target words were each paired with a control-nonacademic word matched on letter length and word frequency using the SUBTLEX-UK database (van Heuven, Mandera, Keuleers, & Brysbaert, 2013). These 158 words were sorted into the categories of academic-approach, academic-avoidance, performance-evaluative, academic-neutral, and nonacademic by 10 postgraduate psychology students. The 10 words assigned by the most judges to a given academic-word category were retained, along with their matched control-nonacademic word, giving a total of 80 word stimuli. As most measures of inter-rater agreement for nominal data have deficiencies when there is low variability in the ratings (Gwet, 2008; Heyman, Lorber, Eddy, & West, 2014), Gwet's AC₁ was used to estimate inter-rater agreement. Average reliability for final words was .78

for academic-approach words, .59 for academic-avoidance words, .69 for performance-evaluative words, .80 for academic-neutral words, and .89 for the nonacademic words, indicating fair to excellent reliability (Heyman et al., 2014). Each word stimulus was matched to a pseudo-word on word length and number of syllables using Wuggy, a pseudo-word generator (Keuleers & Brysbaert, 2010). This gave 160 stimuli in the critical trials.

The lexical decision task itself closely followed that described by Borkenau et al. (2010). Participants were instructed to respond as quickly and accurately as possible in identifying whether a stimulus was a word by pressing the spacebar, and do nothing if the stimulus was not a word. For each trial, a fixation cross appeared on the screen for 500 ms, after which a stimulus appeared on the centre of the screen for 200 ms. A question mark replaced the stimulus for 800 ms or until the participant responded, and reaction time was recorded. If an incorrect response was given, a red X appeared on the screen for 500 ms. This was followed by a 500 ms intertrial interval. The task began with 20 practice trials with stimuli not included in the critical trials. After the practice trials, there were two critical trial blocks where each stimulus was presented in a random order once in each block.

2.3. Procedure

The participants completed the lexical decision task individually in a quiet room, followed by the computerised self-report measures.

3. Results

3.1. Lexical decision task scoring

Three participants responded with error rates over 3 *SD* above the mean (equalling >29% of trials as errors), and were removed due to noncompliance concerns. Scoring on the lexical decision task followed Borkenau et al.'s (2010) method of individually trimmed means. Any trial with an error was removed (4.63% of word trials). Following this, participants' 10% fastest and 10% slowest reaction times for each stimulus category (e.g., academic-approach words, academic-approach matched control-nonacademic words) were removed. Indices were calculated by subtracting the average reaction time for the target word category (e.g., academic-approach words) from the average reaction time for the matched control-nonacademic word category (e.g., the control-nonacademic words matched to the academic-approach words on word length and frequency). A positive CA index indicates faster responding to the target word category than the matched control-nonacademic words. Reliabilities were calculated using the Spearman–Brown split-half coefficient for each block. Reliabilities were .27 for academic-approach, .42 for academic-avoidance, .56 for performance-evaluative, and .40 for academic-neutral words, which are similar to that found in other studies (Borkenau et al., 2010).

3.2. Analysis

One sample *t*-tests were used to see whether overall, indices differed from zero. The results for academic-approach ($t(81) = 1.61$, $p = .11$) and academic-avoidance ($t(81) = -.40$, $p = .68$) were nonsignificant, though those for performance-evaluative ($t(81) = 9.19$, $p < .001$) and academic-neutral ($t(81) = 9.35$, $p < .001$) were significant, indicating trait-independent CA.

As shown in Table 1, conscientiousness and the facets of order and achievement striving were positively correlated with CA of academic-neutral words. Extraversion and the self-efficacy facet of conscientiousness were positively correlated, and neuroticism was negatively correlated with CA of academic-approach words.

Multiple regression was used to test the moderating effect of week of semester upon predicted trait stimuli–category relationships. Week of semester was not a significant moderator for extraversion and

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