WKU

WESTERN KENTUCKY UNIVERSITY

ADVANCING PSYCHOLOGICAL RESEARCH WITH TECHNOLOGY REU (RESEARCH EXPERIENCE FOR UNDERGRADUATES) PROGRAM

The Spirit Makes the Master

1ST ANNUAL REU RESEARCH CONFERENCE

AUGUST 7, 2015

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REU PROGRAM OVERVIEW

What is the REU program?

The Research Experience for Undergraduates (REU) program provided undergraduate students enrolled in colleges and universities where there are limited research opportunities with a unique opportunity to gain hands-on research experience on a topic related to the program theme, which focused on the utilization or examination of technology as a means of advancing psychological research. Students spent 10 weeks (June 1, 2015 - August 7, 2015) working closely with a faculty mentor on research utilizing technological advances in the areas of clinical, cognitive, developmental, educational, industrial/organizational, and/or social psychology. Students also participated in developmental workshops and activities related to topics such as ethics, research methods, statistics, computer software, and presentation skills. At the conclusion of the program, students presented their findings at a mini research conference to university faculty and staff.

What is the overarching purpose of the program?

This program provided students with the opportunity to gain hands-on research experience while furthering our understanding of human behavior and cognition. All students are expected to disseminate their research findings at a national or international conference following completion of the program, and students are strongly encouraged to submit their research findings for publication. Our goal was to have participants develop strong skills as psychological researchers, thereby increasing the likelihood that program participants will pursue graduate degrees and/or careers in psychology.

The theme of the REU site, which was focused on the integration of modern technology into psychological research, not only allowed students to gain exposure to working with cutting-edge technology not available in a number of psychology departments, but to also learn about research topics that are highly relevant to today's society. As such, the program provided participants with both a strong set of research skills and a better understanding of modern issues being addressed in the field of psychology.

SUMMER HIGHLIGHTS

Workshops for Research and Professional Development

Library resources and writing a literature review
APA formatting and literature review feedback
Experimental design and writing a method section
Ethics, submitting to the IRB, and method section feedback
SPSS and Excel overview
Statistics and data analysis
Writing results and discussion sections and creating tables and figures
Maintaining work-life balance
Developing your CV and personal statement
Developing interviewing skills and CV and personal statement feedback
Building and delivering presentations
Mock poster and oral presentation session
Is an academic career for you?

Faculty Brown Bag Research Presentations

Masculinity is reactive: Mortality salience increases masculine, but not feminine, self-stereotyping (Dr. Aaron Wichman)
Put me in, coach: The psychological phenomenology of sport fandom (Dr. Rick Grieve)
Fake it 'til you make it: Examining applicant Facebook distortion (Dr. Amber Schroeder)
Harnessing the teachable moment to enhance care for suicide attempt survivors (Dr. Stephen O'Connor)
Aging and 3D shape recognition (Dr. Farley Norman)
Effects of confusing text on age differences in mindless reading (Dr. Matt Shake)
Examining emotion regulation: A developmental approach (Dr. Diane Lickenbrock)
Measuring creativity (Dr. Jenni Redifer)
Age differences in causal learning and judgment (Dr. Sharon Mutter)

Field Trips Exploring Local Culture and History

Mammoth Cave – Mammoth Cave National Park, Mammoth Cave, KY
The Hermitage, Home of President Andrew Jackson – Nashville, TN

Thank you to the following faculty from the Psychological Sciences and Psychology Departments who led REU workshops, participated in research brown bags, and/or assisted with field trips:

Diane Lickenbrock, Rick Grieve, Lance Hahn, Kelly Madole, Andy Mienaltowski, Sharon Mutter, Farley Norman, Stephen O'Connor, Jenni Redifer, Amber Schroeder, and Aaron Wichman

STUDENT SPOTLIGHTS

Sophie Brunt is a junior at Bowdoin College in Brunswick, ME. She will graduate with a B.A. in Psychology and a minor in Mathematics. After graduation, Sophie plans to apply to Ph.D. programs in Developmental and Clinical Psychology.

Jessica Cooling is a senior at the University of the Cumberlands in Williamsburg, KY. She will graduate with a B.A. in Psychology and Public Health in May 2016. After graduation, Jessica plans to apply to M.A. programs in Clinical Psychology and Counseling.
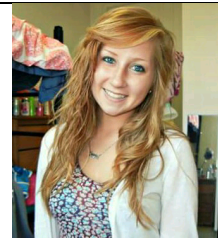
Megan Hurst is a senior at Grove City College in Grove City, PA. She will graduate with a B.A. in Psychology in May 2016. After graduation, Megan plans to apply to Industrial-Organizational Psychology Ph.D. programs and pursue a career in consulting.

Micaela Lippert is a senior at Hiram College in Hiram, OH. She will graduate with a B.A. in Neuroscience in May 2016. After graduation, Micaela plans to apply to Ph.D. programs in Clinical Psychology and educate the public on mental health topics.

STUDENT SPOTLIGHTS

Jessica Lopez is a senior at Trinity Washington University in Washington, D.C. She will graduate with a B.A. in Psychology in December 2015. After graduation, Jessica plans to apply to Social Psychology Ph.D. programs and pursue a career in community advocacy.

Cassidy O' Connell is a junior at Monmouth College in Monmouth, IL. She will graduate with a B.A. in Biopsychology in May 2016. After graduation, Cassidy plans to apply to Ph.D. programs – possibly in occupational therapy.
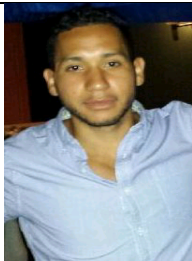
James Salazar is a senior at Montclair State University in Montclair, NJ. He will graduate with B.A. in Psychology and Philosophy in December 2015. After graduation, James plans to apply to Ph.D. programs in Clinical Psychology and Counseling and start a private practice.

Lee Walker is a senior at Salisbury University in Salisbury, MD. He will graduate with a B.A. in Psychology and minors in Business Administration and English. After graduation, Lee plans to earn an MBA, followed by a Ph.D. in Industrial-Organizational Psychology and pursue a career in consulting.

Faculty Mentor Spotlights

Dr. Diane Lickenbrock is a Developmental Psychologist who joined the WKU faculty in 2012 after completing her Ph.D. at the University of Notre Dame. Her research currently examines social and emotional development in infancy, with a focus on family dynamics.

Dr. Stephen O' Connor is a Clinical Psychologist who joined the WKU faculty in 2013 after completing his Ph.D. at the Catholic University of America. His research currently examines aspects of injury prevention, specifically suicide prevention.

Dr. Jenni Redifer is an Educational and Cognitive Psychologist who joined the WKU faculty in 2012 after completing her Ph.D. at the University of Florida. Her research currently focuses on examining factors related to student learning and achievement.

Dr. Amber Schroeder is an Industrial-Organizational Psychologist who joined the WKU faculty in 2012 after completing her Ph.D. at Clemson University. Her research currently focuses on examining the validity of online social media use in organizational settings.

Dr. Matthew Shake is a Cognitive Psychologist who joined the WKU faculty in 2012 after completing his Ph.D. at the University of Illinois. His research currently examines how cognitive aging affects language processing and comprehension.

Dr. Aaron Wichman is a Social Psychologist who joined the WKU faculty in 2009 after completing his Ph.D. at Ohio State University His research currently examines how people respond to uncertainty, specifically as a psychological threat or source of information.

CONFERENCE SCHEDULE

9:00   **WELCOME**

Light breakfast and refreshments will be provided.

9:30   **ORAL ABSTRACT SESSION**

Associations between Parental Personality and Sensitivity on Infant
Cardiac Physiology
   Presenter: Cassidy O'Connell
   Faculty Mentor: Dr. Diane Lickenbrock

Implicit Versus Explicit Decision Making in Applicant Facebook
Evaluations
   Presenter: Megan Hurst
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Self-explanation and Working Memory: Impacts on Problem-solving
   Presenter: James Salazar
   Faculty Mentor: Dr. Jenni Redifer

The Effects of Physical Exercise on Cognitive Control in Older Adults
   Presenter: Jessica Cooling
   Faculty Mentor: Dr. Matthew Shake

Structuring Evaluations of Professionalism on Facebook
   Presenter: Lee Walker
   Faculty Mentor: Dr. Amber Schroeder

Affect Changes Under Mortality Salience: An Independent Confirmation
that Terror Management is Not Affect-Free
   Presenter: Jessica Lopez
   Faculty Mentor: Dr. Aaron Wichman

The Effects of Working Memory Capacity, Cognitive Load, and Intrinsic
Motivation on Mathematical Learning
   Presenter: Sophie Brunt
   Faculty Mentor: Dr. Jenni Redifer

Using the Death/Suicide IAT to Examine Factors Related to Suicidality in
Adolescents
   Presenter: Micaela Lippert
   Faculty Mentor: Dr. Stephen O'Connor

10:00   **POSTER SESSION**

Students will present their research in more detail and answer questions
during this session. See the list of oral abstracts for poster topics.

11:00   **CLOSING REMARKS**

RESEARCH ABSTRACTS

Associations between Parental Personality and Sensitivity on Infant Cardiac Physiology
Cassidy L. O'Connell & Diane M. Lickenbrock

Introduction

Starting at 5 months of age, infants are able to physiologically show aspects of self-regulation, such as the ability to vary their own heart rate (Conradt & Ablow, 2010). One example of a physiological process that illustrates changes in emotion regulation is respiratory sinus arrhythmia (RSA), a measure of the parasympathetic nervous system (Conradt & Ablow, 2010). Baseline RSA can act as a predictor of behaviors (Moore et al., 2009), and higher baseline RSA is an indicator of regulatory capacity (Conradt & Ablow, 2010). One of the potential predictors of differences in infant baseline RSA is parent influences (Conradt & Ablow, 2010). Many studies have found links between parent personality and children's cognition, emotions, and behaviors (Achtergarde et al., 2015). In addition, parental sensitivity, which encompasses a parent's ability to respond accordingly to his/her infant (Conradt & Ablow, 2010), has been found to be one of the strongest predictors of parent-infant relations (Braungart-Rieker et al., 2014). However, the extent to which parent personality and sensitivity predict infant baseline RSA has not been examined in one study. In addition, the extent to which mothers and fathers might differentially predict their infants' baseline RSA has not been examined. Even though previous studies have found differences in how mothers and fathers interact with their infants, father-infant relationships have been less examined than mother-infant relationships (Graham et al., 2010). Despite these differences in parents, no research has examined the roles of parent personality and sensitivity in both mothers and fathers on infant physiology. The current study aimed to address these gaps in the literature by examining how the combination of parent personality and sensitivity predict infant baseline RSA through the inclusion of mothers and fathers in one study.

Method

Participants

Mothers, fathers, and their 6-month old (+/- 14 days) healthy, full-term infants (*n*=32, 40.6% female) participated in the study. Parents were predominantly Caucasian (mothers: 90.6%; fathers 96.9%), middle-age (Mothers: *M*=31, range= 22-44; Fathers: *M*=33.06, range=22-44), highly-educated (100% of mothers vs. 87.5% of fathers completed some college), and middle-class (65.6% of families had incomes ≤ $74,999). Families were compensated $20 for their time.

Procedure

Prior to the laboratory visit, parents were mailed a packet of questionnaires to complete individually. Once the family arrived to the lab, parents provided informed consent, completed a demographic interview, and were also asked to separately complete an additional questionnaire packet. Seven electrodes were placed on the infant and both parents. The parents then separately participated in a baseline period for 180-s with their infant. Then they separately participated in the Still-Face Paradigm (SFP) with their infant (Tronick et al., 1978). Cardiac physiology was collected during the baseline period and the SFP (Mindware BioLab 3.013). Parent order was counterbalanced. All laboratory visits were audio and video-recorded.

Measures

Parent Personality. In order to assess parent personality, the BIS/BAS scale (Carver & White, 1994) was used. The BIS and three BAS subscales (Drive, Fun & Reward) were used.

Parental Sensitivity. Parental sensitivity/intrusiveness during both the play portions of the SFP was rated using an established scale (Braungart-Rieker et al., 2014) by trained, reliable coders from the video-recordings. Sensitivity/ intrusiveness were averaged to make a composite score for sensitivity.

Baseline Respiratory Sinus Arrhythmia (RSA). Trained lab technicians observed

frequencies in 30-s intervals using an HRV Editing program for the first baseline (Mind Ware Technologies).

Results

For mothers, the regression model including parental sensitivity and the BAS subscales revealed two significant interactions: 1) Fun Seeking X Reward Seeking (β=4.02, SE=1.78, t=2.28, p=.037) and 2) BAS Fun seeking X BAS Drive (β=-10.99, SE=4.99, t=-2.21, p=.042). Follow up simple slopes tests for the Fun X Reward interaction revealed that mothers high in BAS Reward had infants with significantly higher baseline RSA as their Fun Seeking increased (β=2.30, SE=.97, t=2.36, p=.03). Follow-up tests revealed no significant differences in the simple slopes for the Fun X Drive interaction. For fathers, a similar regression model revealed one significant interaction: Father Sensitivity X Reward, β=-4.35 SE=1.91, t=-2.28, p=.037. Follow-up simple slopes tests revealed that fathers high in BAS Reward had infants who decreased in baseline RSA as sensitivity increased (β=-2.30, SE=1.28, t=-1.80, p=.091).

Discussion

Across both mothers and fathers components of BAS were found to predict infant baseline RSA. For mothers, BAS drive, fun, and reward were found to predict infant baseline RSA; whereas, for fathers, BAS reward predicted their infant's baseline RSA, along with father sensitivity. For both mothers and fathers, BIS scores did not predict infant baseline RSA. This could be due to the fact that the BIS is involved in punishment, non-reward, and novelty (Carver & White, 1994), which are factors that parents of young infants might not have implemented in their parenting. The overall regression model results were nonsignificant; therefore the results need to be interpreted with caution. However, the current study is ongoing, and future analyses will examine these associations in a larger sample. Findings from the current study stress the importance of parenting as a predictor of infant baseline RSA, and highlights the differential effects of mothers and fathers on infant cardiac physiology.

References

Achtergarde, S., Postert, C., Wessing, I., Romer, G., & Müller, J. M. (2015). Parenting and child mental health: Influences of parent personality, child temperament, and their interaction. *The Family Journal*, *23*(2), 167-179. doi:10.1177/1066480714564316

Belsky, J., & Barends, N. (2002). Personality and parenting. In M. H. Bornstein, M. H. Bornstein (Eds.) , *Handbook of parenting: Vol. 3: Being and becoming a parent (2nd ed.)* (pp. 415-438). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Braungart-Rieker J, Zentall S, Lickenbrock D, Ekas N, Oshio T, & Planalp E. (2014). Attachment in the making: Mother and father sensitivity and infants' responses during the still-face paradigm. *Journal Of Experimental Child Psychology*, 125, 63-84.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal Of Personality And Social Psychology*, *67*(2), 319-333. doi:10.1037/0022-3514.67.2.319

Conradt, E., & Ablow, J. (2010). Infant physiological response to the still-face paradigm: Contributions of maternal sensitivity and infants' early regulatory behavior. *Infant Behavior & Development*, *33*(3), 251-265. doi:10.1016/j.infbeh.2010.01.001

Graham, A. M., Ablow, J. C., & Measelle, J. R. (2010). Interparental relationship dynamics and cardiac vagal functioning in infancy.*Infant Behavior & Development*, *33*(4), 530-544. doi:10.1016/j.infbeh.2010.07.005

Moore, G. A., Hill-Soderlund, A. L., Propper, C. B., Calkins, S. D., Mills-Koonce, W. R., & Cox, M. J. (2009). Mother—infant vagal regulation in the face-to-face still-face paradigm is moderated by maternal sensitivity. *Child Development*, *80*(1), 209-223. doi: 10.1111/j.1467-8624.2008.01255.x

Tronick, E., Als, H., Adamson, L., Wise, S., & Brazelton, B. (1978). The infant's response to entrapment between contradictory messages in face-to-face interaction. *Journal of the American Academy of Child Psychiatry. 17,(1), 1-13.* doi:10.1016/S0002-7138(09)62273

Implicit Versus Explicit Decision Making in Applicant Facebook Evaluations
Megan H. Hurst & Amber N. Schroeder

Introduction

Many employers are utilizing Facebook to gather information about job applicants. However, researchers have discussed that using Facebook for hiring decisions may be an unethical invasion of personal information (Brandenburg, 2007). Facebook allows employers to view protected demographic information that is not usually provided on other applicant documents, and inappropriate use of this information could result in a violation of the equal employment opportunity laws (Nguyen, 2014).

Berkelaar and Buzzanell (2015) found that employers consistently denied that any demographic information is considered in their evaluations of candidates. However, it is possible that the data collection methods used in these studies (i.e., interviews) led employers to give socially desirable answers. Therefore, the purpose of the current study is to add objective, quantitative data to the current literature on Facebook use in the hiring process by collecting both explicit and implicit data using a policy capturing approach.

Pilot Study

A pilot study was conducted to develop materials to be used in the study's Facebook profiles. Seven undergraduate students participated in the pilot study (71.4% female; ages 19 through 23, M =20.86, SD = 1.345; 42.9% Caucasian). The participants were asked to rate Facebook cover photos, walls, and profile pictures. The goal was to identify eight profiles that would portray four distinct levels (i.e., two profiles per level) of *job-related* content (i.e., professionalism and communication skills). Each of the 11 cover photos was rated on professionalism, and each of the 12 Facebook walls was rated on professionalism and communication skills. The means and 95% confidence intervals around the means were examined for each Facebook cover photo and wall. Four high professionalism cover photos with means ranging from 4.86 (SD = 1.22) to 5.29 (SD = 1.38) and four low professionalism cover photos with means ranging from 1.00 (SD = 0.00) to 1.71 (SD = 1.11) were retained. Eight Facebook walls were retained with varying levels of professionalism and communication skills: high professionalism (M = 5.14, SD = 1.07 to M = 6.71, SD = 0.76), low professionalism (M = 1.43, SD = 0.54 to M = 1.86, SD = 0.90), high communication (M = 5.14, SD = 2.12 to M = 6.71, SD = 0.49), and low communication (M = 1.86, SD = 1.07 to M = 2.71, SD = 1.70).

The 96 profile pictures varied in regard to *job-unrelated* demographic characteristics. Each profile picture was either male or female, Black or White, and younger or older. The eight photos retained for use in the full study had 100% agreement for sex and race. The four photos classified as younger had age ratings that ranged from 32.00 (SD = 4.16) to 37.14 (SD = 2.97), and those classified as older ranged from 51.43 (SD = 7.23) to 59.00 (SD = 5.42). Attractiveness and professionalism were relatively consistent across photos.

The Current Study

Policy capturing is an indirect way of gathering data that infers which features are important based on individual ratings (Webster & Travino, 1995). A policy capturing approach includes three parts: giving participants multiple profiles in which independent variables are manipulated, collecting participants' judgments about the dependent variable, and using multiple regression analyses to calculate the weight of each independent variable (Rotundo & Sackett, 2002). By using a policy capturing approach, the current study will evaluate if employers are implicitly using sensitive information in forming impressions of job applicants.

Due to the pressure to give acceptable responses to questions about demographics, the authors hypothesize that when making hiring decisions, raters will implicitly use demographic information more often than explicitly stated. In addition, based on previous research on racial, age, and gender biases, it is hypothesized that raters will implicitly assign lower ratings to African American than White/Caucasian applicants, older than slightly younger applicants, and female than male applicants. Finally, as multiple studies have found evidence that the rater's intelligence and personality impact rating accuracy in a variety of contexts (Lippa & Dietz, 2000), it is expected that raters with higher cognitive ability and higher emotional stability will be less

affected by demographic information when making implicit judgments about job candidates than their counterparts.

Method

One hundred twenty participants will complete the study. Participants will be recruited through Amazon Mechanical Turk (MTurk). MTurk participants will complete a demographics questionnaire, a cognitive ability test, and a personality assessment.

Based on the results of the pilot testing, 64 Facebook profiles will be used in this study. This includes all combinations of Facebook content (i.e., the eight paired wall and cover photos) and eight unique profile photos (i.e., for each sex, race, and age combination). Thus, profiles vary in terms of job-related variables (i.e., professionalism and communication skills) and job-unrelated variables (i.e., sex, race, and age). Each participant will rate the same eight profiles, but the profile picture included in each profile will be randomly assigned so that they receive one profile from each demographic combination.

Participants will rate the profiles by responding to items concerning each applicant's qualifications, predicted job performance, interview and job offer likelihood, and estimated starting salary. After judging all eight profiles, the participants will be asked to allocate 100 points among the independent variables (i.e., age, race, sex, professionalism, and communication skills) to indicate how influential each had been in making their judgment.

Discussion

This study will add to our understanding of the potential for demographics-based bias in job applicant Facebook evaluations. Although people may believe that they are able to ignore demographics on profiles, they may be subconsciously using this information when making hiring decisions. Finally, the results regarding rater differences will reveal who engages in this type of biasing behavior, which is important when considering who to choose to make employee selection decisions.

References

Berkelaar, B. L., & Buzzanell, P. M. (2015). Online employment screening and digital career capital: Exploring employers' use of online information for personnel selection. *Management Communication Quarterly, 29,* 84-113. doi:10.1177/0893318914554657

Brandenburg, C. (2007). The newest way to screen job applicants: A social networker's nightmare. *Federal Communications Law Journal, 60,* 597-626.

Lippa, R. A., & Dietz, J. K. (2000). The relation of gender, personality, and intelligence to judges' accuracy in judging strangers' personality from brief video segments. *Journal of Nonverbal Behavior, 24,* 25-43.

Nguyen, N. T. (2014). Employer's use of social networking sites in applicant screening: An unethical and potentially illegal practice. *Business & Financial Affairs, 3,* 138. doi: 10.4172/2167-0234.1000e138

Rotundo, M., & Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: A policy-capturing approach. *Journal of Applied Psychology, 87,* 66-80.

Webster, J., & Trevino, L. K. (1995). Rational and social theories as complementary explanations of communication media choices: Two policy-capturing studies. *The Academy of Management Journal, 38,* 1544-1572.

Self-explanation and Working Memory: Impacts on Problem-solving
James Salazar & Jenni L. Redifer

Introduction

Determining which instructional techniques reduce cognitive load (CL) is necessary in order to optimize students' use of attentional resources. One instructional method purported to reduce CL is self-explanation (SE, i.e., asking yourself guiding questions). In the present study, we sought to determine whether individual differences in cognitive ability impact the effectiveness of SE strategy instruction.

Working memory (WM) is our ability to temporary information store and process information (Conway et al., 2005). CL is the total amount of mental effort being used (Ayres, 2006). Cognitive Load Theory speculates that higher amounts of CL during demanding tasks hinder the capacity for WM processing (de Jong, 2010). Renkl and Atkinson (2010) suggest that CL affects our ability to employ existing WM resources. SE is a learner's effort to obtain understanding of an answer rationally, in other words, the attempt to make metacognitive inferences. As a strategy, SE can produce comprehension benefits. Learners with low prior knowledge of a task had more success with SE as problem-solving performance improved (Leppink et al., 2011; Renkl & Atkinson, 2010). SE allowed learners with low prior knowledge (novices) to reduce CL. However, people with prior knowledge of a task (experts) had more success problem-solving without the SE strategy. Leppink et al. (2011) suggested that this is due to a well-developed schema structure and automation of problem-solving acquired from existing knowledge. SE produces more CL for experts because unnecessary thinking increases (Leppink et al, 2011).

Beilock and DeCaro (2007) found that people with high working memory use simpler problem-solving strategies than those typically used by people with lower WM. High-WM individuals may already have effective strategies (Schelble, Therriault, & Miller, 2012), so they may not benefit as much from SE training as those with low WM. High-WM participants are more likely to already use effective problem-solving strategies. Those with low WM are less likely to already use effective strategies, and may therefore benefit from explicit strategy instruction. We examined performance and CL differences between participants who were told to use the strategy on a final test, and participants who were not told to use the strategy. We also examined the impact of WM capacity on the effectiveness of SE strategy instruction when participants were told or not told to use the strategy.

Method

A sample of 80 participants residing in the United States who were at least 18 years of age and proficient in English were recruited using Amazon Mechanical Turk (MTurk). Each participant received $2.00 for completing the study. Renkl and Atkinson's (2003) SE training materials and probability problems (including a preexisting probability knowledge test, practice problems with worked examples, and final test) were used to introduce the SE strategy and assess problem-solving performance. Paas' (1992) nine point self-report scale was used to measure CL during problem-solving. We administered a strategy use questionnaire to determine why participants chose to use and chose not to use the SE strategy. The questions measured the consistency of responses given during the open-ended questions, lack of knowledge, blanks in the mind (BIM), and negative affections. A modified Self-Awareness Scale (to be analyzed for a future study) was administered integrating Fenigstein, Scheier, & Buss' (1975) self-consciousness scale to measure private self-consciousness, Zimmerman's (2002) Structure and Function of Regulatory Processes to measure self-regulatory processing phases, and Ashley & Reiter-Palmon's (2012) Self-Awareness Scale to measure insight and reflection. A Ten Item Personality Measure (TIPI) (Gosling et al., 2003) and demographic questionnaire containing questions about participants' age, sex, and previous math courses taken were administered.

Participants were randomly assigned to one of three conditions: SE training followed by a test with SE prompts, SE training followed by a test with no SE prompts, or a control condition

with no SE training or prompts. All participants completed questionnaires on SE and self-awareness, an OSPAN (WM) task, the TIPI, and a series of demographic questions.

Results

Data from final test scores revealed that the control group (M = 62.5%) had higher mathematical performance scores compared to the SE prompt condition (M = 47.96%) and the no-SE prompt condition (M = 48.75%). When additional data is collected, between-subjects one-way ANOVAs will be used to examine test performance as a function of condition and WM capacity. Multiple regression models will be used to examine the additional impacts of SE and math courses on final test performance. Qualitative analysis of strategy use questionnaire responses will be used to examine relationships between strategy use and WM capacity.

Conclusion

Although initial results indicate that the control group had the highest final test scores, more work is needed before conclusions can be drawn. Additional data will be collected so that we can examine the impacts of cognitive ability and strategy prompting on problem-solving performance with an appropriate sample size. Future work will also examine the relationship between self-awareness, SE strategy use, and WM.

References

Ashley, G., & Reiter-Palmon, R. (2012). Self-Awareness and the Evolution of Leaders: The Need for a Better Measure of Self-Awareness. *Journal of Behavioral and Applied Management,* 2-17. http://digitalcommons.unomaha.edu/psychfacpub/7

Ayres, P. (2006). Using subjective measures to detect variations of intrinsic cognitive load within problems. *Learning and Instruction, 16*, 389-400. doi:10.1016/j.learninstruc.2006.09.001

Beilock, S., & Decaro, M. (2007). From poor performance to success under stress: Working memory, strategy selection, and mathematical problem solving under pressure. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 33*, 983-998. doi:10.1037/0278-7393.33.6.98

Fenigstein, A., Scheier, M., & Buss, A. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology, 43*, 522-527. doi:10.1037/h0076760

Gosling, S., Rentfrow, P., & Swann, W. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*, 504-528. doi:10.1016/S0092-6566(03)00046-1

de Jong, T. (2010). Cognitive load theory, educational research, and instructional design: Some food for thought. *Instructional Science, 38,* 105-134. DOI: 10.1007/s11251-009-9110-0

Leppink, J., Broers, N., Imbos, T., Cees P. M. Van Der Vleuten, & Berger, M. (2011). Self-explanation in the domain of statistics: An expertise reversal effect. *Higher Education, 6*, 771-785. doi:10.1007/s10734-011-9476-1

Paas, F. (1992). Training strategies for attaining transfer of problem-solving skill in statistics: A cognitive-load approach. *Journal of Educational Psychology, 84*, 429-434. doi:10.1037/0022-0663.84.4.429

Renkl, A., & Atkinson, R., K. (2003). Structuring the Transition From Example Study to Problem Solving in Cognitive Skill Acquisition: A Cognitive Load Perspective. *Educational Psychologist, 38,* 15-22, doi:10.1207/S15326985EP3801_3

Schelble, J., Therriault, D., & Miller, M. (2011). Classifying retrieval strategies as a function of working memory. *Memory & Cognition, 40*, 218-230. doi:10.3758/s13421-011-0149-1

Moraitou, D., & Efklides, A. (2009). The Blank in the Mind Questionnaire (BIMQ). *European Journal of Psychological Assessment, 25*, 115-122. doi:10.1027/1015-5759.25.2.115

Zimmerman, B. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice, 41*, 64-70. doi:10.1207/s15430421tip4102_

The Effects of Physical Exercise on Cognitive Control in Older Adults
Jessica Cooling, Matthew Shake, & Jason Crandall

Introduction

There have been many studies conducted showing beneficial effects of physical exercise for the physical health of older adults, such as a study that implemented an integrated exercise and health education program for older adults with hypertension (Park, Song, Cho, Lim, Song, & Kim, 2011). In Park et. al's study, the hypothesis was that the program they developed would lead to an improvement in blood pressure control as well as be associated with improved health-related quality of life; the results were consistent with this hypothesis.

Recently, researchers have wondered whether physical exercise may benefit cognitive aspects of aging as well. The central question to ask, then, is whether the functional cognitive capacity of older adults can be preserved and enhanced at all. After conducting a meta-analysis to examine how fitness affects the cognitive functioning of older adults, Colcombe and Kramer (2003) concluded that each of the areas they studied (executive functioning, controlled processes, and visuospatial processes) benefited from the fitness training implemented.

In a more recent approach, a game called Bingocize® was used (Crandall, Fairman, & Anderson, 2015), which incorporates the game of bingo with both exercises and health education. Instead of the typical Bingo, Bingocize® questions involve doing a set exercise or answering a health education question correctly in order to "mark" that square on the Bingo board. This combination to create a multimodal program is expected to improve the cognitive abilities of the participants as well as their physical health and health education knowledge. In the present study, we sought to examine whether a technological administration of Bingocize® (via an app developed for tablets) could be used to improve older adults' physical and cognitive abilities over a 10-week intervention, as compared to a Bingo-only control group. By comparing pre-test and post-test performance, significant physical and cognitive improvements are expected.

Method

Participants

Fifteen participants for the program were recruited from the Larue County Senior Citizens Center in Hodgenville, KY. Males and females over the age of 55 were eligible to participate if they met the following criteria for inclusion: normal or corrected-normal vision, no history of severe neurological impairment, mobility, no history of colorblindness, English as their native language, and a minimum score of 17 on the TMMSE (Telephone Screening Protocol Mini-Mental Status Exam).

Materials

Materials for the study included the Physical Activity Readiness Questionnaire (PARQ), which was used to determine the participant's health status based on responses to several medical questions. Participants answering "yes" to any of the questions were required to get a physician's release prior to participation in the study. In addition, the Telephone Screening Protocol Mini Mental Status Exam (TMMSE) was given over the phone to each participant to determine his or her eligibility for the study. Samsung tablets with the installed Bingocize® 3.0 app were provided to each participant and game leader. Within the app, there were a variety of exercises and health education questions for the older adults to do or answer in order to pick the chosen number on their Bingo card. In addition to the questions, a variety of mild aerobic and anaerobic exercises, such as trunk rotations, back scratches, chair sit and reach, and arm curls could be a task given if spun on the Bingocize® wheel.

There were also three cognitive tasks given to the participants at pre-testing and post-testing to determine any improvements in executive functioning from the program. The first test was a letter memory task. The participants were presented with a series of consonants, one at a time, and then asked to report the last three letters of the sequence. The second test was a color-shape task. Participants would see a letter cue (C for color; S for shape) and then make a decision on what the item presented afterward was (green/red, or a triangle/circle). They would then press an appropriate key on a keyboard to choose the correct answer. The last test was a

sustained attention to response (SART) task. The task involved watching a series of numbers and pressing the space bar for every number with the exception of the number three.

Procedure

Each group of participants was randomly assigned to one of the two conditions in the study. The experimental group participated in Bingocize® 3.0 (bingo, exercise, and health education, twice a week for 10 weeks). The control group participated in traditional bingo only, but for the same duration of time. Both groups used the Bingocize® 3.0 app on tablets that were provided. For each individual, pre-test and post-test assessments consisted of cognitive and physical tests. Since Bingocize® 3.0 is on a tablet, the participants had "virtual" bingo cards which were modified to include numbers on the spaces. Every card had the same numbers, but in a different pattern. The "virtual" spinning wheel with numbers was spun by the game leader. Once the wheel stopped on one of the numbers, either an exercise or health education question was presented to the participants. If a health question was presented, participants had to select an answer. If they chose the right answer, they would choose their number on the card and receive a highlighted space on the app. If they chose incorrectly, they were given the opportunity to continue choosing answers until they selected the correct one. If the wheel spun and landed on an exercise, the participant had to complete the exercise given before clicking their card number. Prizes were awarded to the winners of each game.

Results

The experimental and control groups did not differ on any of the cognitive measures at pre-test, indicating random assignment was effective, all $p > .05$. Also, the typical cognitive performance was found on the SART and CS tasks (i.e., slower RT for Switch trials and lower accuracy on No-Go trials) all $p < .05$.

Discussion

The results of the pre-test data showed that there was no statistical difference between the experimental and control groups prior to intervention. With the Bingocize® program, however, it is expected that the experimental group will differentially improve by the end of the ten week intervention relative to the control group.

References

Park, Y. H., Song, M., Cho, B. L., Lim, J. Y., Song, W., & Kim, S. H. (2011). The effects of an integrated health education and exercise program in community-dwelling older adults with hypertension: a randomized controlled trial. *Patient Educ Couns, 82(1),* 133-137. doi:10.1016/j.pec.2010.04.002

Hertzog, C., Kramer, A. F., Wilson, R. S., & Lindenberger, U. (2009). Enrichment Effects on Adult Cognitive Development. *Psychological Science in the Public Interest, 9(1),* 1–66.

Colcombe, S., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: a meta-analytic study. *Psychological Science, 14(2),* 125–30.

Crandall, K. J., Fairman, C., & Anderson, D. (2015). Functional performance in older adults after a combination multicomponent exercise program and bingo game. *International Journal of Exercise Science, 8(1),* 38-48.

Structuring Evaluations of Professionalism on Facebook

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Introduction

A social networking website (SNW) is an online profile of a person that can be used for social interaction (Brown & Vaughn, 2011). Facebook is an informal SNW that boasts over one billion members and many different mediums for communication (Wilson, Gosling, & Graham, 2012). Facebook is widely used for cybervetting job applicants (Berkelaar & Buzzanell, 2015), which refers to the act of searching for information about an applicant online using search engines or social media. Studies show that SNWs can be accurate portrayals of a person's identity (Wilson et al., 2012). However, delicate information is available online that can be used to discriminate against applicants (Brown & Vaughn, 2011). One reason that cybervetting could lead to the possibility for bias is that it is commonplace for an unstructured approach to be used. Structured assessment, such as in the context of interviews, has been shown to drastically increase the validity of job performance predictions (Baker & Spier, 1990). Thus, the current study aims to develop a structured assessment tool for cybervetting contexts, specifically focusing on professionalism. By assessing professionalism, which has been linked to hirability, starting salary, and relevant job outcomes (Bartol, 1979; Bohnert & Ross, 2010), bias can be reduced and organizations can potentially select better employees.

In addition to expecting higher reliability for more structured cybervetting approaches, Campion and colleagues (1997) found that including more components of structure into assessments increases their reliability and validity, which increases confidence in the evaluations as well. As such, it is expected that rater confidence in the validity of professionalism ratings will increase as the structure of the assessment tool increases. Confidence in assessments can also be increased by familiarity with the subject. For instance, when only 25% of Roulin and Bangerter's (2013) raters had SNWs, it was suggested that the lack of rater SNW familiarity may have been responsible for differences in the raters' evaluations. Consequently, these findings suggest that raters who are more proficient with Facebook are likely to (a) have higher confidence in the validity of their professionalism ratings and (b) demonstrate higher reliability in ratings than raters with lower Facebook proficiency.

Development of a Model

As extant professionalism models differ in their focus, in the current study, a comprehensive model of professionalism was developed based on the literature across multiple domains. Six articles from different contexts (e.g., medicine, military, Department of Labor) were found to contain very different models or definitions of professionalism. Fifty-six characteristics of professionalism were pulled from these articles and were reduced to 36 unique traits, which were then sorted into six meaningful dimensions. These six dimensions included: moral/ethical characteristics, which is defined as engagement in behavior meeting socially derived standards of "what is right," such as behavior demonstrating loyalty, integrity, and confidentiality; impression management skills, which is defined as management of others' perceptions of one's ability to uphold professional standards, including dressing appropriately and regulating one's behavior; external focus/sensitivity, which is defined as the focus on the welfare and respectful treatment of others; interpersonal/communication skills, which is defined as the ability to effectively interact and collaborate with others; task-oriented knowledge, skills, & abilities (KSAs), which is defined as knowledge, traits, and skills related to the completion of work tasks, such as competence, initiative, and problem-solving skills; and professional investment, which is defined as focus on maintaining a strong relationship with one's occupation and its stakeholders.

Method

The study will include 400 full-time employees recruited from Amazon Mechanical Turk in the United States with two or more years of experience as a recruiter, a hiring manager, or in another human resources role involved with the hiring process. Participants will evaluate three Facebook profiles of varying levels of professionalism using one of three conditions: an unstructured rating format, a moderately structured rating format, or a highly structured rating

format. The unstructured format will ask raters to judge the profile on overall professionalism (i.e., one item). The moderately structured format will ask raters to judge profiles on the six dimensions of professionalism from the comprehensive model and professionalism overall. The highly structured format will have the raters judge professionalism on each of the six professionalism dimensions while looking separately at photographs versus text, as well as provide an overall professionalism rating. Definitions of each dimension will be provided in both of the structured conditions. Additionally, in the unstructured condition, raters will be asked to rate the final profile a second time using the moderately structured approach to assess the difference in rater confidence when using each approach. All participants will provide demographic information, self-reported professionalism ratings, confidence in the professionalism ratings they provided for each profile, and Facebook proficiency.

Discussion

The comprehensive model of professionalism developed for the current study provides an overarching framework for future research and applied work in organizational contexts. Future research will be able to apply this model of professionalism to develop training programs and assessments for employees in other contexts. Organizations will be able to use this model of professionalism to evaluate both current and future employees in routine assessments while being able to give meaningful expectations for the work environment. In addition, this study will allow for a better understanding of whether a structured approach to cybervetting can increase rating reliability and reduce the potential for discrimination. If raters are more confident in assessments with more structure, then organizations may want to be more detailed in their personnel selection criteria. If raters with greater Facebook proficiency have greater inter-rater reliability, this would suggest that organizations may want to consider training employees responsible for hiring decisions on how to navigate social networking websites.

References

Baker, H. G., & Spier, M. S. (1990). The employment interview: Guaranteed improvement in reliability. *Public Personnel Management, 19,* 85-90.

Bartol, K. M. (1979). Professionalism as a predictor of organizational commitment, role stress, and turnover: A multidimensional approach. *Academy of Management Journal, 22,* 815-821. doi:10.2307/255817

Berkelaar, B. L., & Buzzanell, P. M. (2015). Online employment screening and digital career capital: Exploring employers' use of online information for personnel selection. *Management Communication Quarterly, 29,* 84-113. doi:10.1177/0893318914554657

Bohnert, D., & Ross, W. H. (2010). The influence of social networking web sites on the evaluation of job candidates. *Cyberpsychology, Behavior, and Social Networking, 13*, 341-347. doi:10.1089=cyber.2009.0193

Brown, V. R., & Vaughn, E. D. (2011). The writing on the (Facebook) wall: The use of social networking sites in hiring decisions. *Journal of Business & Psychology, 26,* 219-225. doi:10.1007/s10869-011-9221-x

Campion, M. A., Palmer, D. K., & Campion, J. E. (1997). A review of structure in the selection interview. *Personnel Psychology, 50,* 655-702.

Kluemper, D. H., & Rosen, P. A. (2009). Future employment selection methods: evaluating social networking web sites. *Journal of Managerial Psychology, 24,* 567-580. doi:10.1108/02683940910974134

Wilson, R. E., Gosling, S. D., & Graham, L. T. (2012). A review of Facebook research in the social sciences. *Perspectives on Psychological Science, 7,* 203-220. doi:10.1177/1745691612442904

Roulin, N., & Bangerter, A. (2013). Social networking websites in personnel selection: A signaling perspective on recruiters' and applicants' perceptions. *Journal of Personnel Psychology, 12,* 143-151. doi:10.1027/1866-5888/a000094

Affect Changes Under Mortality Salience: An Independent Confirmation that Terror Management is Not Affect-Free

Jessica Lopez & Aaron Wichman

Introduction

Terror management theory (TMT) focuses on the unique cognitive capacity humans possess that make them aware that one day they will die (Hart, 2014). A copious amount of research has focused on an explanation that suggests individuals seek worldview validation when confronted with reminders of death. After eliciting reminders of death, some of the basic effects observed are an increased likelihood to engage in prosocial behavior (e.g. donating to charity) and stronger identification with in-group values (e.g. adherence to American values vs. foreign values) (Martin & van den Bos, 2014). Mortality salience (MS) is theorized to elicit anxieties that cause individuals to seek defense mechanisms to cope with reminders of death. However, TM research has continuously yielded null effects for self-reported affect changes (e.g. Arndt, Allen, & Greenberg, 2001). Lambert et al. (2014) recently found that individuals experience affect changes when thoughts of their mortality were made salient. More specifically, results revealed that these affect changes were highly associated with fear (vs. anxiety).

In the present study, we conducted an independent replication of Lambert et al. (2014) to examine the reliability of affect changes under mortality salience. This replication represents an important aspect of scientific research; conducting direct replications to ensure that findings from previous studies are reliable. Some may argue that replication studies should be done by the original laboratories, because replication failures from other laboratories may lead to inconsistencies in the findings (e.g. Cesario, 2014). However, as Simons (2014) explains, if an effect is real and robust any experienced researcher should be able to replicate the study and find the same results. If affect changes under MS were found to be replicable and reliable, this could allow TM researchers to consider alternative explanations that are more cognitively straight-forward than the older approach explaining responses to mortality salience in terms of attempts to transcend the corporal self by aligning with culture. This could also lead to a reconciliation with the research on emotions and their effects on social judgments. In the present study, similar to Lambert et al.'s (2014) findings, it was expected to see a higher level of self-reported fear (vs. anxiety) from participants in the MS condition.

Method

A sample of 353 participants residing in the United States, who were at least 18 years of age and proficient in English, were recruited using Amazon's Mechanical Turk for a small monetary compensation. Participants were randomly assigned to one of three conditions: mortality salience (MS), dental pain (aversive control), and TV (neutral control). As done in previous TM research, participants in the MS condition were asked to "describe the emotions that the thought of your own death arouses in you" and then to "write down as specifically as you can what you think will happen to you physically when you die." In the dental pain condition, participants were asked to "describe the emotions that the thought of dental pain arouses in you" and then to "write down as specifically as you can, what you think will happen to you as you physically experience dental pain and once you have experienced dental pain." Similarly, participants in the TV condition were asked to "describe the emotions that the thought of watching TV arouses in you" and to "write down as specifically as you can, what you think will happen to you as you physically experience watching TV and as you are physically watching TV." All participants were prompted to write their answer in a text box provided for each question. After completing the assigned task, participants were asked to rate their mood in response to various affect items, complied from Lambert et al.'s (2014) study and the PANAS (Watson, Clark, & Tellegen, 1988), on a 5-point Likert scale.

Results

As expected, participants in the MS condition self-reported higher levels of fear (vs. dental vs. TV). A one-way ANOVA revealed that condition had a significant effect on affect; $f(2,353)=6.85$, $p<0.001$. A post hoc Tukey's HSD test showed that all conditions differed significantly at $p<0.01$.

Discussion

The present study was able to replicate findings from Lambert et al. (2014) that show participants in the MS condition (vs. dental pain vs. TV) self-reported higher levels of fear (vs. anxiety). Findings from the present study provide further evidence that terror management is not affect-free. As TM research continues to move forward it is important to consider the implications of affect changes when individuals are reminded of their mortality. A vast amount of research has investigated the effects of affect on social judgments. Emotions can impact memory encoding and retrieval, as well as impact persuasion in a variety of ways. For instance, research shows that inducing an emotion such as anger makes persuasive messages outlining the anger inducing behaviors of a disliked group even more powerful in changing attitudes (e.g. DeSteno, Petty, Rucker, Wegener, & Braverman, 2004). The finding that MS causes changes in affect fundamentally alters how we think about terror management as a human motive.

References

Arndt, J., Allen, J. J. B., & Greenberg, J. (2001). Traces of Terror: Subliminal Death Primes and Facial Electromyographic Indices of Affect. *Motivation and Emotion*, *25*(3), 253–277. http://doi.org/10.1023/A:1012276524327

Cesario, J. (2014). Priming, Replication, and the Hardest Science. *Perspectives on Psychological Science*, *9*(1), 40–48. http://doi.org/10.1177/1745691613513470

DeSteno, D., Petty, R. E., Rucker, D. D., Wegener, D. T., & Braverman, J. (2004). Discrete Emotions and Persuasion: The Role of Emotion-Induced Expectancies. *Journal of Personality and Social Psychology*, *86*(1), 43–56. http://doi.org/10.1037/0022-3514.86.1.43

Hart, J. (2014). Toward an Integrative Theory of Psychological Defense. *Perspectives on Psychological Science*, *9*(1), 19–39. http://doi.org/10.1177/1745691613506018

Lambert, A. J., Eadeh, F. R., Peak, S. A., Scherer, L. D., Schott, J. P., & Slochower, J. M. (2014). Toward a greater understanding of the emotional dynamics of the mortality salience manipulation: Revisiting the "affect-free" claim of terror management research. *Journal of Personality and Social Psychology*, *106*(5), 655–678. http://doi.org/10.1037/a0036353

Leonard L Martin, K. V. D. B. (2014). Beyond terror: Towards a paradigm shift in the study of threat and culture. *European Journal of Social Psychology*, *25*(1), 32–70. http://doi.org/10.1080/10463283.2014.923144

Simons, D. J. (2014). The Value of Direct Replication. *Perspectives on Psychological Science*, *9*(1), 76–80. http://doi.org/10.1177/1745691613514755

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070. http://doi.org/10.1037/0022-3514.54.6.1063

The Effects of Working Memory Capacity, Cognitive Load, and Intrinsic Motivation on Mathematical Learning

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Introduction

Working memory (WM) capacity, cognitive load (CL), and intrinsic motivation have each been separately identified as factors in influencing math performance. WM capacity entails individual differences in the ability to control attention to actively maintain relevant information, and has long been known to be highly correlated with performance on a wide range of cognitive activities (Engle, 2002). CL is the total amount of strain that instructional material imposes on WM (de Jong, 2010). Intrinsic motivation, known as the internally derived enjoyment of learning for the sake of learning, also impacts students' mathematical performance (Gottfried, Fleming & Gottfried, 2001; Cordova & Lepper, 1996). Although we know how WM and CL interact to affect learning, no research has combined these factors with intrinsic motivation manipulations, so the present study will investigate the interaction among these three factors in mathematical learning.

Previous literature has confirmed that individuals high in WM capacity outperform those with low WM capacity when under low CL, but that when pressure or stress is added, extraneous CL increases, resulting in performance declines for people with high (but not low) WM (Beilock & Carr, 2005). These effects, however, are dependent on the type of CL (Paas et al, 2004). In fact, the consensus in the literature is that minimizing intrinsic and extraneous CL and maximizing germane CL (i.e., the load that directly contributes to learning) contributes to optimal learning (de Jong, 2010; Paas et al., 2004). One way of increasing germane CL is to include worked solution steps for students to study, and this has been shown to improve the effectiveness of mathematical instructional material (Renkl, Atkinson, & Maier, 2000)

Increasing intrinsic motivation has also been shown to increase mathematical performance (Gottfried, Fleming, & Gottfried, 2001). Cordova and Lepper (1996) tested the effects of adding personalization, context, and choice to educational computer games, and found that children who received all three of these factors outperformed those in any other condition. Thus, the researchers successfully increased intrinsic motivation in the participants and demonstrated that learning occurred more effectively in the presence of intrinsic motivation (Cordova & Lepper, 1996).

It is easy to see how each of the above-reviewed factors could contribute to mathematical learning, and how WM and CL interact to affect learning. The present study further investigated the interaction among WM capacity, CL, and intrinsic motivation. We hypothesized that intrinsic motivation would increase from the pretest to the posttest for participants in the context manipulation conditions (Cordova & Lepper, 1996). We also hypothesized that individuals high in WM capacity should outperform low WM individuals in all manipulations, regardless of the levels of intrinsic motivation and CL (Beilock & Carr, 2005; DeCaro & Beilock, 2010). Furthermore, individuals high in WM who experience high germane CL (in the form of worked solution steps) (Renkl et al., 2000) and high intrinsic motivation should perform the best (Paas et al., 2004; Gottfried et al., 2001; Cordova & Lepper, 1996).

Method

Participants were workers on Amazon's Mechanical Turk. All participants completed a Qualtrics survey that began with an intrinsic motivation pretest (Ryan, 1982). Next, participants completed a practice test under one of four conditions. In two of the conditions, intrinsic motivation was manipulated by using a personalized zombie apocalypse theme. In one of these conditions, worked examples were also included to increase germane CL. In the other, no worked examples were included. In the third condition, participants only received worked examples and in the control condition participants received neither worked examples nor context. CL was measured during the practice test. Next, and intrinsic motivation posttest was administered. Participants then completed a shortened version of the automated Operation Span (OSPAN) task to measure their WM capacity (Foster et al., 2014).

Results

Results of a one-way ANOVA revealed no significant differences between mean test scores among conditions, $F(3,9) = .63$, $p = .61$. An independent samples t-test revealed no differences in test scores between low and high WM individuals, $t(7) = 1.33$, $p = .23$. Finally, a repeated-measures ANOVA comparing intrinsic motivation scores during the pretest and posttest by condition revealed that participants who received a context condition experienced increased intrinsic motivation compared to those who received no context, $F(3,9) = 5.68$, $p = .018$. These results supported the hypothesis that adding personalization, context, and choice would increase intrinsic motivation.

Discussion

The relatively small sample size ($N = 13$) may have been the largest factor in limiting the findings. Because there were only approximately three participants in each condition, it is likely that individual differences, and not the manipulations, accounted for most of the variance in scores. Thus, it was difficult to see any effects of the treatment conditions. We did not find differences in test scores among conditions or between high and low WM groups, but we hope that a larger sample size will bring out these effects. We did, however, find that intrinsic motivation increased significantly more for participants who received the context than participants who did not receive the context, supporting the hypothesis that adding personalization, context, and choice to the problems would increase intrinsic motivation in adults. The next step in this study will be to administer the tasks to more participants, in the hopes that the treatment effects will outweigh individual differences.

References

Beilock, S. & Carr, T. (2005). When high-powered people fail: Working memory and "choking under pressure" in math. *Psychological Science*, *16*, 101-105. doi:10.1111/j.0956-7976.2005.00789.x

Cordova, D. & Lepper, M. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology, 88,* 715-730. doi:10.1037/0022-0663.88.4.715

DeCaro, M. & Beilock, S. (2010). The benefits and perils of attentional control. In B. Bruya (Ed.), *Attentional Control* (51-73). Cambridge, MA: MIT Press.

de Jong, T. (2010). Cognitive load theory, educational research, and instructional design: some food for thought. *Instructional Science, 38,* 105-134. doi:10.1007/s11251-009-9110-0

Engle, R. (2002). Working memory capacity as executive attention. *Current Directions in Psychological Science, 11,* 19-23. doi:10.1111/1467-8721.00160

Foster, J. L., Shipstead, Z., Harrison, T. L., Hicks, K. L., Redick, T. S., Engle, R. W. (2014). Shortened complex span tasks can reliably measure working memory capacity. *Memory and Cognition.* doi:10.3758/s13421-014-0461-7

Gottfried, A. E., Fleming, J. & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: a longitudinal study. Journal of Educational Psychology*, 93,* 3-13. doi:10.1037//0022-0663.93.1.3

Paas, F. G. (1992). Training strategies for attaining transfer of problem-solving skill in statistics: A cognitive-load approach. *Journal of Educational Psychology*, *84*, 429-434. doi:10.1037/0022-0663.84.4.429

Paas, F., Renkl, A. & Sweller, J. (2004). Cognitive load theory: Instructional implications of the interaction between information structures and cognitive architecture. *Instructional Science*, *32*, 1-8. http://dx.doi.org/10.1023/B:TRUC.0000021806.17516.d0

Renkl, A., Atkinson, R. K., & Maier, U. H. (2000). From studying examples to solving problems: Fading worked-out solution steps helps learning. In *Proceedings of the 22nd annual conference of the cognitive science society*.

Using the Death/Suicide IAT to Examine Factors Related to Suicidality in Adolescents
Micaela Lippert & Stephen O'Connor

Introduction
Recently, a reaction time test called the death/suicide implicit association test (SIAT) made by Nock et al. (2010) has been used to assess suicidal patients. The SIAT is a measure that scores users on a spectrum of life or death orientation. One potential use of the SIAT is to examine factors related to suicidality. It was hypothesized that low importance placed on reasons for living, low self-esteem, high impulsivity, and high mental pain would be associated with a stronger death orientation on the SIAT.

Method
Reason for living were measured using the Reasons for Living Inventory for Adolescents (RFL-A) created by Osman et al. (1996). The RFL-A is divided into five subscales: family alliance, peer-acceptance and support, self-acceptance, future optimism and suicide-related concerns. These subscales were all compared to the SIAT individually as well. Self-esteem was measured with Rosenberg's self-esteem scale (RSES) (Rosenberg, 1965). There were no subscales used for this measure. Impulsive behavior was measured with the UPPS-P Impulsive Behavior Scale, created by Cyders et al. (2007). Three subscales of the UPPS-P were measured: negative urgency, positive urgency, and sensation seeking. Mental pain was measured by Orbach and Mikulincer's Mental Pain Scale (Orbach, Mikulincer, Gilboa-Schectman, & Pinhas, 2003). Three subscales of this measure were used: irreversibility, loss of control, and narcissist wounds.

17 adolescents were recruited from an inpatient psychiatric hospital. There were 11 females and 6 males, with a mean age of 15.0 (*SD* = 1.46). Parental assent and participant consent was obtained for all participants. The study was approved by the Institutional Review Board and the hospital's Human Rights Commission. The participants completed all four self-report measures and the SIAT.

The SIAT was scored as recommended by Greenwald, Nosek, and Banaji (2003). Self-report measures were scored by averaging responses. Linear regression was used to determine relationships between self-report measures and SIAT scores.

Results
Overall RFL-A scores showed a highly significant relationship with SIAT scores, β =-.249, $t(16)$ = -3.86, p = .002. High death orientation on the SIAT related to low importance placed on reasons for living. Suicide-related concerns did significantly predict SIAT scores, with a lower number of suicide-related concerns relating to a higher orientation towards death β = -.134, $t(16)$ = -2.86, p = .012. Self-acceptance showed a similar relationship to SIAT scores , β = -.122, $t(16)$ = -2.72, p = .016. While the future optimism subscale did not have a significant relationship with SIAT scores, it was close enough to be noted, β = -.166, $t(16)$ = -2.11, p = .052. The other RFL-A subscales, family alliance and peer-acceptance and support, did not show any significant relationship to SIAT scores.

Self-esteem scores were also strong predictors of SIAT scores, β = -.288, $t(16)$ = -3.26, p = .005. Lower self-esteem was related to a stronger orientation towards death on the IAT.

SIAT scores were also compared to the OMMP mental pain scale and the UPPS-P personality inventory. No significant correlations were found for either of these measures or their subscales.

Discussion
Gutierrez, Osman, Kopper, and Barrios (2010) also did a study on the relationship between the subscales of the RFL-A and suicidality and found similar results. It seems that family alliance and peer acceptance are not strong motivators for adolescents to continue living. It's possible that external factors, such as social support, are not as important in determining death orientation or suicidality as internal factors, such as self-acceptance. Another explanation is that the adolescents in these studies lack social support, and so cannot consider it an important reason for living. The RFL-A does not indicate whether or not someone has family alliance or support, only the importance that they place on it as a reason for living.

Neither current mental pain nor impulsive behavior was related to death orientation. These results were unexpected based on previous studies, which found relationships between suicidality and these factors (Claes & Muehlenkamp, 2013; Orbach et al., 2003). However, one difference between this and other studies is that in this study, suicidality was measured based on death orientation. There may be differences in factors related specifically to suicidal behavior those related to death orientation. It's plausible that someone with a high death orientation who is not impulsive would not partake in suicidal behavior.

References

Claes, L., & Muehlenkamp, J. (2013). The relationship between the UPPS-P impulsivity dimensions and nonsuicidal self-injury characteristics in male and female high-school students. *Psychiatry Journal*. doi:10.1155/2013/654847 (Advanced online publication).

Cyders, M., Smith, G., Spillane, N., Fischer, S., Annus, A., Peterson, C., (2007). Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment*, 19, 107-118. doi:10.1037/1040-3590.19.1.107

Greenwald, A., Nosek, B., Banaji, M., (2003). Understanding and using the implicit association test: an improved scoring algorithm. *Journal of Personality and Social Psychology*, 85, 197-216. doi:10.1037/0022-3514.85.2.197

Gutierrez, P., Osman, A., Kopper, B., Barrios, F., (2000). Why young people do not kill themselves: the reasons for living inventory for adolescents. *Journal of Clinical Child Psychology*, 29, 177-187. doi:10.1207/S15374424jccp2902_4

Nock, M., Park, J., Finn, C., Deliberto, T., Dour, H., & Banaji, M. (2010). Measuring the suicidal mind: implicit cognition predicts suicidal behavior. Psychological Science, 21, 511 517. doi:10.1177/0956797610364762

Orbach, I., Mikulincer, M., Gilboa-Schechtman, E., Pinhas, S., (2003). Mental pain and its relationship to suicidality and life meaning. *Suicide and Life-Threatening Behavior*, 33, 231-41. doi:10.1521/suli.33.3.231.23213

Osman, A., Kopper, B., Barrios, F., Osman, J., Besett, T., Linehan, M, (1996). The Brief Reasons for Living Inventory for Adolescents (BRFL-A). *Journal of Abnormal Child Psychology*, 24, 433-444. https://depts.washington.edu/brtc/files/Osman,%20A.%20(1996)%20The%20Brief%20FL%20for%20Adolescents%20(BRFL-A).pdf

Rosenberg, M., (1065). *Society and the adolescent self-image*. Princeton, NJ: Princeton University press.

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