Open Science Practices: Badges of Honor
Special Invited Editor: Steven V. Rouse, Pepperdine University, CA
DEDICATION STATEMENT
This issue is dedicated to JON GRAHE, PhD (2016–17 Psi Chi President, Pacific Lutheran University), who first introduced Psi Chi Journal to the Open Science Badges program and later proposed the topic of this special issue. Over the years, Jon has worked tirelessly to create collaborative research opportunities for Psi Chi students, and supported the Journal’s transition to an Open Access publication.

ABOUT PSI CHI
Psi Chi is the International Honor Society in Psychology, founded in 1929. Its mission: “recognizing and promoting excellence in the science and application of psychology.” Membership is open to undergraduates, graduate students, faculty, and alumni making the study of psychology one of their major interests and who meet Psi Chi’s minimum qualifications.

Psi Chi is a member of the Association of College Honor Societies (ACHS), and is an affiliate of the American Psychological Association (APA) and the Association for Psychological Science (APS). Psi Chi’s sister honor society is Psi Beta, the national honor society in psychology for community and junior colleges.

Psi Chi functions as a federation of chapters located at over 1,130 senior colleges and universities around the world. The Psi Chi Central Office is located in Chattanooga, Tennessee. A Board of Directors, composed of psychology faculty who are Psi Chi members and who are elected by the chapters, guides the affairs of the Organization and sets policy with the approval of the chapters.

Psi Chi membership provides two major opportunities. The first of these is academic recognition to all inductees by the mere fact of membership. The second is the opportunity of each of the Society’s local chapters to nourish and stimulate the professional growth of all members through fellowship and activities designed to augment and enhance the regular curriculum. In addition, the Organization provides programs to help achieve these goals including conventions, research awards and grants competitions, and publication opportunities.

JOURNAL PURPOSE STATEMENT
The twofold purpose of the Psi Chi Journal of Psychological Research is to foster and reward the scholarly efforts of psychology students as well as to provide them with a valuable learning experience. The articles published in the Journal represent the work of undergraduates, graduate students, and faculty. To further support authors and enhance journal visibility, articles are now available in the PsycINFO®, EBSCO®, Crossref®, and Google Scholar® databases. In 2016, the Journal also became open access (i.e., free online to all readers and authors) to broaden the dissemination of research across the psychological science community.

JOURNAL INFORMATION
The Psi Chi Journal of Psychological Research (ISSN 2325-7342) is published quarterly in one volume per year by Psi Chi, Inc., The International Honor Society in Psychology.

For more information, contact Psi Chi Central Office, Publication and Subscriptions, 651 East 4th Street, Suite 600, Chattanooga, TN 37403, (423) 756-2044. www.psichi.org; psichijournal@psichi.org.

Statements of fact or opinion are the responsibility of the authors alone and do not imply an opinion on the part of the officers or members of Psi Chi.

ADVERTISEMENTS
Advertisements that appear in Psi Chi Journal do not represent endorsement by Psi Chi of the advertiser or the product. Psi Chi neither endorses nor is responsible for the content of third-party promotions. Learn about advertising with Psi Chi at www.psichi.org/?page=Advertise

PERMISSION TO REPRINT
Permission must be obtained from Psi Chi to reprint or adapt a table or figure; to reprint quotations exceeding the limits of fair use from one source, and/or to reprint any portion of poetry, prose, or song lyrics. All persons wishing to utilize any of the above materials must write to the publisher to request nonexclusive world rights in all languages to use copyrighted material in the present article and in future print and nonprint editions. All persons wishing to utilize any of the above materials are responsible for obtaining proper permission from copyright owners and are liable for any and all licensing fees required. All persons wishing to utilize any of the above materials must include copies of all permissions and credit lines with the article submission.

OPEN SCIENCE PRACTICES: BADGES OF HONOR
94  Introduction to the Special Issue on Open Science Practices: Badges of Honor
Steven V. Rouse
Pepperdine University

98  Self-Esteem, Self-Disclosure, Self-Expression, and Connection on Facebook:
A Collaborative Replication Meta-Analysis
Dana C. Leighton*, Southern Arkansas University; Nicole Legate*, Illinois Institute of Technology;
Sara LePine, Gordon College; Samantha F. Anderson, University of Notre Dame; and
Jon Grahe*, Pacific Lutheran University

110 Disclosure of Diagnosis Increases Positivity of Social Responses to Autistic Individuals
Matthew J. Bolton and Lara K. Ault*
Saint Leo University

119 Parental Attachment Predicting Emotions and Stress During Positive Life Events
Abigail A. Camden and Jennifer L. Hughes*
Agnes Scott College

132 Role of Self-Compassion on College Students’ Social Self-Evaluations and Affect Across Two Domains
Zenab Saeed and Tammy L. Sonnentag*
Xavier University

142 Participant Attentiveness to Consent Forms
Derek Baker and Christopher R. Chartier*
Ashland University

147 Exposure to Media on Perceptions of Violence as a Function of Trait Aggression and Athletic Status
Courtney D. Gross and Albee Therese O. Mendoza*
Wesley College

157 Positive Disability Identity Predicts Sense of Belonging in Emerging Adults With a Disability
Ashley Raver, Hanna Murchake, and Holly M. Chalk*
McDaniel College

166 Not All Roles Are the Same: An Examination Between Work-Family-School Satisfaction, Social Integration, and Negative Affect Among College Students
Emily C. Denning, Portland State University; Debi Brannan*, Western Oregon University;
Lauren A. Murphy*, Northeastern University; Josephina A. Losco, Western Oregon University;
and Danielle N. Payne, University of Washington

*Faculty mentor
Introduction to the Special Issue on Open Science Practices: Badges of Honor

Steven V. Rouse
Pepperdine University

ABSTRACT. Psi Chi Journal of Psychological Research recently began awarding Open Science Badges to studies meeting criteria for Open Materials, Open Data, Preregistration, and Replication. To inaugurate this initiative, this special issue gathers eight articles that reflect a wide diversity of topics but have each earned one or more badges. Reflections about the challenges and value of each of these practices are provided.

As a faculty member, I am sometimes frustrated when textbook publishers release a new edition of a textbook just two or three years after the previous edition, thereby making it harder for my students to have access to more reasonable used editions. Every new edition dutifully reports the large number of new references added since the previous edition, but in many cases the content itself has not changed sufficiently to warrant a new edition. Admittedly, for some courses, the knowledge base is growing at such a rapid pace that frequent revision is needed. For other courses, changes occur but those changes are not dramatic enough to warrant a two-year or three-year cycle. I used to point to Research Methods courses as an example; certainly, best practices in research methodology change, but it seemed unlikely that this would be a topic that would experience a sudden quantum shift. I was wrong.

As I wrote previously (Rouse, 2017), we appear to be at a turning point in which the standard practices of psychological research are being scrutinized, both by people inside our science and by external critics. Although the catalyst for this scrutiny was a very public case of fraud (a history that is described in more depth by Rouse, 2017), the effect showed that common practices in psychological research had, frankly, shifted away from many of the best practices that are often taught in Research Methods courses. For example, students in Research Methods courses are often taught about the importance of replication; even if a study yields a $p$ value low enough to make it unlikely that the results were due to chance factors, such Type I errors are still possible, and confidence in the finding can be bolstered if replicated. Nevertheless, few journals were willing to publish replications because of a perception that replication studies only make a minor impact on the science. As another example, students in Research Methods courses are often taught about the importance of carefully planning one’s data collection and data analysis methodology prior to the onset of the study. Nevertheless, many researchers deviated from their initial plans if their results did not get below a $p$ value of .05, making post-hoc changes such as increasing the sample size, revising the data analysis, or excluding outlier participants to nudge the $p$ value to an acceptable level. These post-hoc changes (many of which would have been completely defensible if planned from the onset of the study) had the effect of increasing the likelihood of Type I errors and thereby decreasing the likelihood that the finding was replicable.

To encourage new standards of best research practices, the Center for Open Science developed badges that could be awarded to journal articles that followed specific criteria of transparency, openness, and replicability—badges for Open Materials, Open Data, and Preregistration (described in Rouse, 2017). Journals were invited to begin awarding these badges within their own pages. By accepting this invitation in 2016, Psi Chi Journal of Psychological Research was among the
first peer-reviewed empirical research journals in psychology to honor authors who followed these best practices. But the journal was even more trailblazing; to the best of our knowledge, this was the first empirical research journal in psychology to introduce a fourth badge, recognizing the importance of Replication studies. When the decision was made to begin awarding Open Science Badges, Jon Grahe (who was president of Psi Chi at that time) recommended a novel idea to help launch this initiative: publishing a Special Issue to highlight these new badges. Whereas most journals publish special issues that focus on a specific topical content, we wanted a special issue that would represent the full breadth of psychological research; the unifying factor would not be a specific topic but rather a commitment to earn one or more Open Science Badges.

It has been my honor to work with eight teams of researchers in the development of this issue. As hoped, the articles included in this special issue are as varied as the field of psychology itself. These researchers studied topics related to the attentiveness of research participants to consent form information (Baker & Chartier, 2018); the effect that being told someone is on the autism spectrum has on social attitudes toward that individual (Bolton & Ault, 2018); the impact of insecure attachment on memories of positive but stressful life events (Camden & Hughes, 2018); the interplay between work, school, and family satisfaction in predicting social integration and negative affect (Denning, Brannan, Murphy, Losco, & Payne, 2018); the effect of violent video for college students who are or are not student athletes (Gross & Albee, 2018); a collaborative, replication meta-analysis to explore previously published findings on the relationship between self-esteem and self-disclosure on Facebook (Leighton, Legate, LePine, Anderson, & Grahe, 2018); the degree to which thinking of oneself as “disabled” enhances a sense of belonging among disabled young adults (Raver, Murchake, & Chalk, 2018); and the protective effect of self-compassion when receiving undesirable feedback about one’s interpersonal or academic abilities (Saeed & Sonnentag, 2018). The wide diversity of topics (many well beyond the bounds of my own areas of expertise) required me to rely heavily on a team of exceptional masked reviewers, but the editorial board was committed to the belief that this special issue should reflect the breadth of our field.

Insights Gained

Open Materials
The experience of working with this special issue helped me gain insights about each of the four badges. First, the Open Materials badge was earned by all eight articles. To earn this badge, all of the research materials (with the exception of copyright-protected materials) must be stored in an open-access free repository in the Open Science Framework (OSF); if a researcher used copyright protected materials, those materials would need to be legally purchasable by qualified researchers wishing to conduct a replication. In each case, the Author Note at the end of the article provides the Internet address at which an interested reader can freely access all of the nonproprietary materials that would be needed to perform an exact replication. Upon reflection, it’s not surprising that this badge was the most common because it represents steps that do not require advanced planning; a researcher can decide to make original research materials publicly available at any stage of the research process. Having worked with these research teams on this issue, I have come to the opinion that the vast majority of all future articles could easily earn this badge.

Open Data
Second, all but one of the articles earned the Open Data badge. To earn this badge, the research data itself must be publicly stored in an OSF website, allowing other researchers to download and reanalyze the data reported in the manuscript. For each of the articles earning this badge, you will find the web address for the OSF website in the Author Note at the end of the article. Obviously, all identifying information for the participants must be stripped from the dataset, but all of the data necessary to perform the analyses must be available. Although almost all of the articles met this requirement, I see two challenges that researchers will face if they seek this badge. The first challenge is a personal one; at the risk of sounding melodramatic, making one’s data publicly available is an act of bravery. After innumerable hours invested in a research project, it is not surprising that people might feel protective of their data, only making it available to other researchers who clearly explain their intentions in using it. Although one does not relinquish ownership of copyright protected materials, those materials would need to be legally purchasable by qualified researchers wishing to conduct a replication. In each case, the Author Note at the end of the article provides the Internet address at which an interested reader can freely access all of the nonproprietary materials that would be needed to perform an exact replication. Upon reflection, it’s not surprising that this badge was the most common because it represents steps that do not require advanced planning; a researcher can decide to make original research materials publicly available at any stage of the research process. Having worked with these research teams on this issue, I have come to the opinion that the vast majority of all future articles could easily earn this badge.

Open Data
Second, all but one of the articles earned the Open Data badge. To earn this badge, the research data itself must be publicly stored in an OSF website, allowing other researchers to download and reanalyze the data reported in the manuscript. For each of the articles earning this badge, you will find the web address for the OSF website in the Author Note at the end of the article. Obviously, all identifying information for the participants must be stripped from the dataset, but all of the data necessary to perform the analyses must be available. Although almost all of the articles met this requirement, I see two challenges that researchers will face if they seek this badge. The first challenge is a personal one; at the risk of sounding melodramatic, making one’s data publicly available is an act of bravery. After innumerable hours invested in a research project, it is not surprising that people might feel protective of their data, only making it available to other researchers who clearly explain their intentions in using it. Although one does not relinquish ownership of copyright-protected materials, those materials would need to be legally purchasable by qualified researchers wishing to conduct a replication. In each case, the Author Note at the end of the article provides the Internet address at which an interested reader can freely access all of the nonproprietary materials that would be needed to perform an exact replication. Upon reflection, it’s not surprising that this badge was the most common because it represents steps that do not require advanced planning; a researcher can decide to make original research materials publicly available at any stage of the research process. Having worked with these research teams on this issue, I have come to the opinion that the vast majority of all future articles could easily earn this badge.
person’s data for their own research without gaining explicit permission—it might be difficult to prioritize the value of scientific transparency over the desire to protect the security of their own hard work. The second challenge is an institutional one; researchers who wish to earn this badge must either notify their Institutional Review Board (IRB) that data would be publicly available before collecting the data or seek IRB approval after data collection. Personally, I have begun including the following explanatory statement in consent forms before submitting my protocols for IRB review: “No information identifying me will ever be published in connection with this study. As part of the Open Science movement, the data collected from this project will be publicly archived in perpetuity at https://osf.io but any identifiable data will be eliminated from the data set prior to uploading; therefore, there will be no identifiable information in the archived data set.”

Preregistration

Only two articles (Baker & Chartier, 2018; Leighton et al., 2018) earned the Preregistration badge. To earn this badge, the authors are required to complete a form prior to data collection or data analysis specifying all relevant plans for the study; this online form is then “frozen” in an unmodifiable form. For these two articles, the Author Note provides the website address for the preregistered plans. It is not surprising that this badge was earned infrequently; eligibility for this badge requires a research team to actively complete an additional step early in the research process. However, adding this extra step to the preparation phase of a research project would not be demanding; after all, the information provided in a preregistration is similar to the information provided for an IRB review. Consider, for example, the eight questions a researcher must answer when completing the “As Predicted” form on OSF (which can be seen for the Baker & Chartier (2018) study at https://osf.io). The researcher must (a) provide the main hypothesis for the study, (b) describe the dependent variables, (c) explain different experimental conditions to which participants will be assigned, (d) list the statistical analyses that will be conducted, (e) describe whether any secondary analyses are planned, (f) specify the target sample size, (g) preregister any other relevant aspects of the study (such as exclusionary/inclusionary factors), and (h) indicate whether or not the data have already been collected. Any researcher who has already received IRB approval could easily answer these eight questions; it only requires taking an extra step between the IRB proposal and the onset of the study. Therefore, although few articles in this special issue received the Preregistration badge, I predict that these badges will become more common as researchers begin to see how easily this practice can be integrated into the research process.

Replication

Only one article (Leighton et al., 2018) earned the Replication badge. To earn this badge, a study must be an exact replication of a previously published study or must systematically adjust one or more variables to explore the generalizability of the findings. The Author Note at the end of the Leighton et al. (2018) study clearly specifies the original study being replicated. Although there is a growing reassertion of the value of replication studies in scientific research, replication studies were viewed as being less important than original studies for several years, and it may take some time for researchers to begin seeing the importance of this type of research. To that end, the Leighton et al. (2018) article can serve as an exemplar of a replication study that effectively explores the nuances of the generalizability of previously published findings.

Conclusion

Times are changing, and the field of psychology is adjusting to new practices of openness and transparency in the research process. This will make the field stronger, bolstering our confidence in the strength and generalizability of the research findings. However, as this special issue demonstrates, these new standards can easily be incorporated into the research process. Therefore, I want to express appreciation to these eight research teams for serving as models of these Open Science Practices.

References

Denning, E. C., Brannan, D., Murphy, L. A., Losco, J. A., & Payne, D. N. (2018). Not all roles are the same: An examination between work-family-school
satisfaction, social integration, and negative affect among college students. 
https://doi.org/10.24839/2325-7342.JN23.2.166

violence as a function of trait aggression and athletic status. Psi Chi Journal 
of Psychological Research, 23, 147–156. 
https://doi.org/10.24839/2325-7342.JN23.2.147

estee, self-disclosure, self-expression, and connection on Facebook: A 
collaborative replication meta-analysis. Psi Chi Journal of Psychological 

sense of belonging in emerging adults with a disability. Psi Chi Journal of 
Psychological Research, 23, 157–165. 
https://doi.org/10.24839/2325-7342.JN23.2.157

Rouse, S. V. (2017). The red badge of research (and the yellow, blue, and green 
https://doi.org/10.24839/2325-7342.JN22.1.2

Saeed, Z., & Sonnentag, T. L. (2018). The role of self-compassion on college 
students’ social evaluations and affect across two domains. Psi Chi Journal 
of Psychological Research, 23, 132–141. 
https://doi.org/10.24839/2325-7342.JN23.2.132

Author Note. Steven V. Rouse, Social Sciences Division, 
Pepperdine University. 
Correspondence concerning this article should be 
addressed to Steven V. Rouse, Social Sciences Division, 
Pepperdine University, 24255 Pacific Coast Highway, Malibu, 
CA 90265. E-mail: steve.rouse@pepperdine.edu
Self-Esteem, Self-Disclosure, Self-Expression, and Connection on Facebook: A Collaborative Replication Meta-Analysis

Dana C. Leighton*, Southern Arkansas University; Nicole Legate*, Illinois Institute of Technology; Sara LePine, Gordon College; Samantha F. Anderson, University of Notre Dame; Jon Grahe*, Pacific Lutheran University

ABSTRACT. This replication meta-analysis explored the robustness of a highly cited study showing that those with low self-esteem perceived benefits for self-disclosure through Facebook compared to face-to-face interactions (i.e., Forest & Wood, 2012, Study 1). Seven preregistered direct replication attempts of this study were conducted by research teams as part of the Collaborative Replication and Education Project (CREP), and results were meta-analyzed to better understand the strength and consistency of the effects reported in the original study. Half of the original results were clearly supported: Self-esteem negatively predicted perceived safety of self-disclosure on Facebook as compared to face-to-face interactions (meta-analytic effect size = -0.28, original effect size = -0.31), and self-esteem did not relate to perceived opportunities for self-expression; across the 7 replications, all 95% confidence intervals (CIs) for effect sizes included 0. However, 2 other findings received less support: Self-esteem only weakly and inconsistently predicted perceived advantages of self-disclosure on Facebook (meta analytic effect size = -0.16, original effect size = -0.30), and contrary to the original study, there was no evidence for self-esteem predicting perceived opportunities for connection with others on Facebook (6 of the 7 replication effect size CIs contained 0). The results provided further evidence regarding the original study’s generalizability and robustness. The implications of the research and its relevance to social compensation theory is presented, and considerations for future multisite replications are proposed.

Among social network sites, Facebook is a dominant platform that affects the thinking, emotions, behavior, and interactions of its active users, some two billion people worldwide, including 70% of the U.S. population (Facebook, 2017; Fiegerman, 2017; Kemp, 2017). It is therefore important that psychologists better understand how Facebook use is related to psychosocial factors. Indeed, since its advent in 2004, scholars have published over a thousand articles on psychological issues related to Facebook.

Forest and Wood (2012) provided one of the first and most highly cited psychological examinations of Facebook use and psychosocial factors. As of December 2017, Elsevier’s Scopus citation metrics show the article has been cited 145 times (12.17
times the average for similar articles), putting it in the 99th percentile of citations for psychology articles in the previous 18 months. Forest and Wood speculated that Facebook had benefits for people with low self-esteem who might otherwise have difficulty with face-to-face (FTF) interactions, and hypothesized that people with low self-esteem would perceive Facebook as a safer place to self-disclose, and a better place to express their emotions with others as compared to FTF interactions. Study 1 provided mixed support for their hypothesis: Compared with higher self-esteem individuals, those lower in self-esteem saw Facebook as a safer and more advantageous place for self-disclosure as compared to FTF interactions (Forest & Wood, 2012, Study 1), but self-esteem did not predict participants’ perceptions of Facebook as offering greater opportunities for self-expression. Thus, the authors concluded that people with low self-esteem might prefer Facebook over FTF interactions as a means to improve their social relations.

Given the potential implications of these findings and their high impact, several research teams at U.S. colleges and universities replicated the study as part of the Collaborative Research and Education Project (CREP; Grahe et al., 2016; https://osf.io/wfc6u/). CREP was designed to verify research (Earp & Trafimow, 2015), among other factors. The CREP compiles replication efforts from independent teams of undergraduate researchers across the United States. Projects are peer-reviewed before the data collection begins to ensure fidelity to the original procedures. Data and results are made publically available on the Open Science Framework (OSF) repository, and a researcher might include the results of individual replications into a meta-analysis as Calin-Jageman, Lehman, and Elliott (2017) are doing with both published and CREP samples.

There have been debates about the “proper” way to conduct replications. For example, one debate distinguished between direct (also called “close”) and conceptual replications (Brandt et al., 2014; Simons, 2014; Stroebe & Strack, 2014). Direct replications approximate the exact conditions of the original study to report the degree of similarity between the original research findings and the replication(s). Conceptual replications alter one or more aspects of the study to extend the original conclusions. All studies reported in this research were direct replications of the original.

Beyond the degree of match between the original and replication, the goals of replication also vary across studies. Anderson and Maxwell (2016) identified six goals of replications: (a) to infer the existence of an effect, (b) to infer the null effect, (c) to accurately estimate the effect size, (d) to combine

Increasingly, replications are seen as a mechanism to improve our scientific enterprise (Edlund, 2016). Social media and technology have increasingly been used to conduct large-scale crowd-sourced replications, including the Reproducibility Project for Psychology (Open Science Collaboration, 2015), whereby 200 researchers replicated 100 studies published in three top journals in 2008, as well as the various Many Labs projects (Many Labs 1–5; Ebersole et al., 2016; Ebersole et al., 2017; Klein et al., 2014; Klein, Ebersole, et al., 2017; Klein, Vianello, et al., 2017). CREP developed to address the replication crisis by capitalizing on research projects completed by undergraduate psychology majors in methods and capstone courses⁴ (Grahe et al., 2012; Grahe & Hauhart, 2013; Hauhart & Grahe, 2010). These projects reflect major advances in replication methodology and meta-science by going beyond single “episodes” of replications, taking better account of the “historical track record” of scientific theories (Faust & Meehl, 2002, p. 2).

The CREP compiles replication efforts from independent teams of undergraduate researchers across the United States. Projects are peer-reviewed before the data collection begins to ensure fidelity to the original procedures. Data and results are made publically available on the Open Science Framework (OSF) repository, and a researcher might include the results of individual replications into a meta-analysis as Calin-Jageman, Lehman, and Elliott (2017) are doing with both published and CREP samples.

There have been debates about the “proper” way to conduct replications. For example, one debate distinguished between direct (also called “close”) and conceptual replications (Brandt et al., 2014; Simons, 2014; Stroebe & Strack, 2014). Direct replications approximate the exact conditions of the original study to report the degree of similarity between the original research findings and the replication(s). Conceptual replications alter one or more aspects of the study to extend the original conclusions. All studies reported in this research were direct replications of the original.

Beyond the degree of match between the original and replication, the goals of replication also vary across studies. Anderson and Maxwell (2016) identified six goals of replications: (a) to infer the existence of an effect, (b) to infer the null effect, (c) to accurately estimate the effect size, (d) to combine

Replications as a Tool for Generalizability and Meta-Science

Social psychology is currently recovering from a crisis of confidence in published findings (Earp & Trafimow, 2015; Edlund, 2016; Pashler & Wagenmakers, 2012; Stroebe, 2016) that arose from concerns about rampant publication bias (Ioannidis, 2005), under-reporting of researcher degrees of freedom (John, Lowenstein, & Prelec, 2012), and revelations of scientific misconduct (Earp & Trafimow, 2015), among other factors. Increasingly, replications are seen as a mechanism to improve our scientific enterprise (Edlund, 2016).

Social media and technology have increasingly been used to conduct large-scale crowd-sourced replications, including the Reproducibility Project for Psychology (Open Science Collaboration, 2015), whereby 200 researchers replicated 100 studies published in three top journals in 2008, as well as the various Many Labs projects (Many Labs 1–5; Ebersole et al., 2016; Ebersole et al., 2017; Klein et al., 2014; Klein, Ebersole, et al., 2017; Klein, Vianello, et al., 2017). CREP developed to address the replication crisis by capitalizing on research projects completed by undergraduate psychology majors in methods and capstone courses⁴ (Grahe et al., 2012; Grahe & Hauhart, 2013; Hauhart & Grahe, 2010). These projects reflect major advances in replication methodology and meta-science by going beyond single “episodes” of replications, taking better account of the “historical track record” of scientific theories (Faust & Meehl, 2002, p. 2).

The CREP compiles replication efforts from independent teams of undergraduate researchers across the United States. Projects are peer-reviewed before the data collection begins to ensure fidelity to the original procedures. Data and results are made publically available on the Open Science Framework (OSF) repository, and a researcher might include the results of individual replications into a meta-analysis as Calin-Jageman, Lehman, and Elliott (2017) are doing with both published and CREP samples.

There have been debates about the “proper” way to conduct replications. For example, one debate distinguished between direct (also called “close”) and conceptual replications (Brandt et al., 2014; Simons, 2014; Stroebe & Strack, 2014). Direct replications approximate the exact conditions of the original study to report the degree of similarity between the original research findings and the replication(s). Conceptual replications alter one or more aspects of the study to extend the original conclusions. All studies reported in this research were direct replications of the original.

Beyond the degree of match between the original and replication, the goals of replication also vary across studies. Anderson and Maxwell (2016) identified six goals of replications: (a) to infer the existence of an effect, (b) to infer the null effect, (c) to accurately estimate the effect size, (d) to combine

It is important to note that the CREP is not the only meta-science project for undergraduate research (see e.g., Registered Reports and Pipeline projects; Grahe et al., 2016).
Facebook and Self-Esteem Meta-Analysis | Leighton, Legate, LePine, Anderson, and Grahe

the results between replication and original, (e) to determine if the replication and original provide inconsistent results (disparity of effect sizes), and (f) to determine if the replication and original provide consistent results (equivalence of effect sizes). In their content analyses of 50 studies, there was a clear preference for Goal 1, to infer the existence of an effect, but they recommended that researchers broaden their definition of replication by recognizing these various goals in planning and reporting replication studies.

Because of the nature of our replication studies, we were most interested in addressing Anderson & Maxwell’s (2016) Goals 1 and 5, and a modified version of Goals 3 and 4. We now describe these goals as applied to the current study in more detail. In addition to traditional significance tests on the focal effects in the replication studies (Goal 1), we tested whether the effect size from each replication study was statistically different from the original (Goal 5). We did not develop these studies expecting a null finding, so Goals 2 and 6 are not presently applicable. Consistent with Goal 3, we reported confidence intervals (CIs) around our effect sizes to highlight accuracy, but fully committing to Goal 3 would require a different form of sample size planning (accuracy in parameter estimation; see Maxwell, Kelley, & Rausch, 2008). Further, because we had the advantage of presenting findings from several replication studies, rather than a single replication, we conducted a modified version of Goal 4, wherein we meta-analytically combined the seven replication study results rather than combining a single replication with the original. By using these cutting-edge methods to evaluate the CREP replications, our results provided a more complete picture of replication than the majority of previously published replication studies, many of which used only a simple significance test on a single replication.

The Present Replication Meta-Analysis

In the present investigation, we meta-analyzed replications of Forest & Wood’s (2012) Study 1 that were retrieved from CREP contributions with published data and/or results on the CREP project pages. These CREP research teams represented five diverse institutions, both public and private, in urban, suburban, and rural settings in the eastern, midwestern, and western United States, both teaching-focused and research-intensive, and from fewer than 2,000 to over 50,000 students. The teams of 2–9 undergraduate students and faculty mentors followed the same methodology, with slight deviations.

Method

The General CREP Procedure

The CREP Advisory Board (see https://osf.io/z4k5/) selected high-impact studies for replication. Specifically, the board selected the top three or four most-cited articles from the top journal in each of nine subdisciplines from the prior three years. Studies were selected based on high feasibility for undergraduate researchers. Forest and Wood’s (2012) Study 1 was selected for this reason by the CREP team in 2015. Authors of selected articles received a standard letter informing them of the purpose of the CREP project and how their study was selected. Authors were able to provide further suggestions to the project leaders before studies were published for replication. In the present research, the authors provided no further suggestions for the replication.

A list of selected studies was published on the CREP project page (see https://osf.io/3laue/). Potential contributors (most often undergraduates, but also their faculty mentors) reviewed the list and informed project leaders of their intention to replicate as either Direct replications (matching the procedures of the original study as closely as possible) or Direct-Plus replications (where additional dependent variables can be measured after the original procedure is complete).

Contributors and their faculty mentors (whose function was to guide contributors and ensure high quality procedures for data collection and analyses) compiled evidence of their ability to conduct the study (completed study materials, a video of the experimental procedure, and evidence of institutional review board approval). Contributors’ project materials were reviewed by a CREP team consisting of three faculty reviewers (Executive Reviewer, plus two reviewers) and a student administrative advisor. After receiving approval of the replication materials and procedure, contributors preregistered their studies before data collection. The CREP team specified the minimum sample size required for the replication; this size was generally set at the original study’s sample size, which was small enough to be feasible for undergraduate student researchers, but set at 100 for larger studies. All studies in this meta-analysis received this approval by the CREP team, collected the minimum number of participants specified by the CREP (80 for the present study because this was the sample size in
the original study), posted their raw dataset, and reported a summary of results.

**Participants in and Procedures of Forest and Wood (2012) CREP Replications**

Participants in all studies were undergraduate students at the five universities and colleges in the United States where the replications were conducted from February 2016 to June 2017 (see Table 1 for a list of the participating institutions). Sample sizes ranged from 80 to 374. Five participants who were not Facebook users were excluded from analyses. The average age in the seven datasets ranged from 19.3 to 26.2 (SDs ranging from 1.4 to 9.7), compared with 21.35 years for the original study. Across datasets, 67% of all participants were women and 33% were men, compared with 73% and 21% in the original study (6% were “undisclosed”). In three replications (BYU-W17, IIT-Sp16, and IIT-Sp17), race data was collected, but in all other studies no other demographic information was collected because the original Forest and Wood (2012) research did not indicate that any other demographic information was collected (see Table 2 for demographic statistics).

After informed consent, participants completed the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965), which assesses global self-esteem on a scale of 1 to 4 (1 to 5 in two of the studies). Research teams combined all items such that higher scores indicated higher self-esteem. The score showed good reliability across datasets (α coefficients range from .88 to .91). The composite self-esteem score was mean centered in accord with the Forest and Wood (2012) analysis.

Next, participants completed a measure of Facebook use perceptions created by the original researchers (Forest & Wood, 2012). Three items each assessed the degree to which participants believed Facebook enabled them to express themselves and to connect with others. Perceived safety of self-disclosure on Facebook compared to in-person interactions was measured with nine items. Ten more items assessed perceived advantages of disclosing on Facebook versus FTF. All items were rated on a scale ranging from 1 to 7 with higher scores representing greater perceived expression, connection, safety, and advantages. Subscale scores showed adequate to good internal consistency (expression: α ranged from .70 to .80; connection: .68 to .84; safety: .84 to .91; advantages: .89 to .94; these compare to .88, .72, .87, and .93, respectively, in the original study).

Some research teams chose a Direct-Plus replication and included additional personality-type measures following the primary measures. Because they followed the primary measures, and the results are not relevant to the present research, they are not presented here.

As the original research did not specify whether participants completed questionnaires in a lab or online, researchers employed both methods (three replications had participants complete in lab only, two used online only, and two used both methods). Participants completing questionnaires in the lab did so alone, except for the Southern Arkansas University replication, which ran participants in groups of two to six. Two other known differences across replications involved minor discrepancies in presentation of the Rosenberg Self-Esteem Scale: (a) one study (IIT-Sp16) had slight differences in item order and in wording on 4 out of 10 items (e.g., ‘At times I think I am no good at all’ vs. ‘I think I am no good at all’), and (b) most replications used the original four-point scale, although two replications (IIT-Sp16 and IIT-Sp17) used a five-point scale. Three studies were Direct-Plus replications that included measures of personality, presented after participants completed self-esteem and Facebook perception measures for the replication, in order to test novel hypotheses (see https://osf.io/726nx/ for a spreadsheet listing various study characteristics). These –Plus measures were not included in the present analyses although interested researchers can find the original data at the CREP OSF project (see https://osf.io/pcmq5/ for links).

After completion of data collection, teams independently analyzed the results and posted their materials, data, and results on their project’s OSF pages. Contributors did not always post analysis scripts, so procedures to account for missing data are not known for all studies. Two studies included analysis scripts that showed scores for all scales were mean averaged. The means for scores in most studies implied that the items were mean averaged, but the Gordon study’s mean implied items were summed.
The Present Meta-Analysis

This meta-analysis synthesized seven direct preregistered replications of Forest and Wood (2012) Study 1 that were part of the CREP project (see https://osf.io/pcmq5/). The Forest and Wood (2012) CREP replication project page on the OSF has 17 “forks” representing research teams or institutions that have started the replication process (see https://osf.io/pcmq5/forks/). These teams generated seven studies that met the minimum sample size, and posted data and results for the study in the OSF repository. All seven studies were included in this meta-analysis.

Effect size extraction. The original Forest and Wood (2012) regression results included t statistics and degrees of freedom for all variables, so we chose to calculate effect size r for all four outcome variables in the study. The replication effect size r statistics were calculated in the same way for consistency. One replication study failed to report regression results, so we calculated the regression statistics from the study’s dataset, which was necessary to calculate effect sizes because one result in Forest & Wood (2012) did not include the standardized beta coefficient.

![TABLE 1](chart1.png)

Regression Results for Original and Replication Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Authors</th>
<th>N</th>
<th>( \beta )</th>
<th>p</th>
<th>( \beta )</th>
<th>p</th>
<th>( \beta )</th>
<th>p</th>
<th>( \beta )</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original</td>
<td>Forest &amp; Wood</td>
<td>80</td>
<td>-0.81</td>
<td>0.05</td>
<td>-0.22</td>
<td>0.05</td>
<td>-0.31</td>
<td>0.05</td>
<td>-0.30</td>
<td>0.05</td>
</tr>
<tr>
<td>BYU-Sp16</td>
<td>Wiggins et al.</td>
<td>90</td>
<td>-0.13</td>
<td>0.11</td>
<td>0.24</td>
<td>0.08</td>
<td>-0.09</td>
<td>0.43</td>
<td>-0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>BYU-W17</td>
<td>Foster et al.</td>
<td>90</td>
<td>-0.14</td>
<td>0.09</td>
<td>0.24</td>
<td>0.07</td>
<td>-0.09</td>
<td>0.45</td>
<td>-0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>Gordon</td>
<td>Nicholson et al.</td>
<td>80</td>
<td>-0.99</td>
<td>0.30</td>
<td>-0.09</td>
<td>0.06</td>
<td>-0.20</td>
<td>0.03</td>
<td>-0.33</td>
<td>0.02</td>
</tr>
<tr>
<td>IT-Sp16</td>
<td>Legate et al.</td>
<td>116</td>
<td>-0.71</td>
<td>0.16</td>
<td>0.18</td>
<td>0.03</td>
<td>-0.39</td>
<td>0.01</td>
<td>-0.24</td>
<td>0.01</td>
</tr>
<tr>
<td>IT-Sp17</td>
<td>Legate et al.</td>
<td>94</td>
<td>-0.06</td>
<td>0.14</td>
<td>0.27</td>
<td>0.03</td>
<td>-0.33</td>
<td>0.00</td>
<td>-0.17</td>
<td>0.00</td>
</tr>
<tr>
<td>MSU</td>
<td>Tweiten et al.</td>
<td>374</td>
<td>-0.60</td>
<td>0.24</td>
<td>-0.06</td>
<td>0.26</td>
<td>-0.20</td>
<td>0.01</td>
<td>-0.11</td>
<td>0.03</td>
</tr>
<tr>
<td>SAU</td>
<td>Everett et al.</td>
<td>81</td>
<td>-0.60</td>
<td>0.59</td>
<td>-0.23</td>
<td>0.03</td>
<td>-0.30</td>
<td>0.06</td>
<td>-0.23</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note. Beta coefficients are standardized (consistent with the original research). Effect size r is equivalent to the beta coefficient. BYU = Brigham Young University–Idaho, Rexburg, ID; Gordon = Gordon College, Wenham, MA; IT = Illinois Institute of Technology, Chicago, IL; MSU = Michigan State University, East Lansing, MI; SAU = Southern Arkansas University, Magnolia, AR.

*The replication study did not report a beta coefficient for this variable.

![TABLE 2](chart2.png)

Descriptive Statistics for All Replication Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Gender</th>
<th>Race/Ethnicity</th>
<th>Self-esteem</th>
<th>Express</th>
<th>Connect</th>
<th>Safety</th>
<th>Advantageous</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU-Sp16</td>
<td>90</td>
<td>23 Female, 67 Male</td>
<td>2.29 (0.24)</td>
<td>3.59 (1.30)</td>
<td>3.60 (1.41)</td>
<td>5.60 (1.13)</td>
<td>5.50 (1.13)</td>
</tr>
<tr>
<td>BYU-W17</td>
<td>90</td>
<td>19 Female, 71 Male</td>
<td>2.91 (0.51)</td>
<td>4.26 (1.27)</td>
<td>4.40 (1.26)</td>
<td>2.30 (1.11)</td>
<td>3.22 (1.38)</td>
</tr>
<tr>
<td>Gordon</td>
<td>80</td>
<td>14 Female, 66 Male</td>
<td>50.48 (9.88)</td>
<td>12.15 (4.08)</td>
<td>11.76 (3.96)</td>
<td>16.26 (8.39)</td>
<td>22.18 (11.72)</td>
</tr>
<tr>
<td>IT-Sp16</td>
<td>116</td>
<td>78 Female, 38 Male</td>
<td>3.78 (0.75)</td>
<td>3.94 (1.48)</td>
<td>3.90 (1.56)</td>
<td>2.53 (1.17)</td>
<td>3.52 (1.38)</td>
</tr>
<tr>
<td>IT-Sp17</td>
<td>94</td>
<td>47 Female, 47 Male</td>
<td>3.81 (0.87)</td>
<td>3.96 (1.54)</td>
<td>3.81 (1.52)</td>
<td>2.47 (1.28)</td>
<td>3.08 (1.28)</td>
</tr>
<tr>
<td>MSU</td>
<td>374</td>
<td>112 Female, 260 Male</td>
<td>3.88 (0.68)</td>
<td>4.31 (1.42)</td>
<td>4.42 (1.46)</td>
<td>2.15 (1.06)</td>
<td>2.87 (1.40)</td>
</tr>
<tr>
<td>SAU</td>
<td>81</td>
<td>14 Female, 67 Male</td>
<td>3.06 (0.54)</td>
<td>4.97 (1.25)</td>
<td>4.62 (1.36)</td>
<td>2.39 (0.98)</td>
<td>3.21 (1.16)</td>
</tr>
</tbody>
</table>

Note. n/a = Data not available. N/c = Data not collected. BYU = Brigham Young University–Idaho, Rexburg, ID; Gordon = Gordon College, Wenham, MA; IT = Illinois Institute of Technology, Chicago, IL; MSU = Michigan State University, East Lansing, MI; SAU = Southern Arkansas University, Magnolia, AR.
was made openly available on OSF. Effect size $r$ represented the size and direction of the relationship of self-esteem scores to the four outcome variables (opportunity to express self, opportunity to connect with others, safety of self-disclosure, and advantageous self-disclosure). The effect sizes had a positive sign if self-esteem was positively associated with the outcome variable and a negative sign if the relationship was negative.

**Meta-analytic method.** Each study was a direct replication of the original, so the materials and methods were very close to the original. However, methodological variations among the studies (e.g., collecting data on computers vs. paper-pencil) and heterogeneity of the host institution population led us to use a random- rather than fixed-effects model (Borenstein, Hedges, Higgins, & Rothstein, 2009). Analyses were conducted using the R package metafor (Viechtbauer, 2010). The rma package was used, which accepts the effect size $r$ and $N$ parameters (syntax is available on the OSF page https://osf.io/r659c/). We chose to use the restricted maximum likelihood (REML) model because it has been shown to exhibit less bias than the more commonly used DerSimonian and Laird (DL) model with small numbers of studies (Veroniki et al., 2016). The rma function converted effect size $r$ to Fisher’s $z$ for the calculations, and we converted $z$ back to effect size $r$ for reporting of results (Borenstein et al., 2009). The function also reports heterogeneity statistics $Q$, $I^2$, and $R^2$. Finally, we conducted a fail-safe number (FSN) analysis (Rosenberg, 2005) using the fsn function. The FSN analysis was intended to identify the number of nonsignificant, unreported studies required to add to the meta-analysis to reduce a significant meta-analytic result to nonsignificance.

We also chose to analyze the effect size differences between the original study and each of the replications. Anderson and Maxwell (2016) proposed this as one of the goals of replication analysis (Goal 5, To assess whether replication is clearly inconsistent with original) and provided a statistical method for this goal. We adapted the method to use effect size $r$ to estimate 95% CIs for the difference in effect sizes for each of the replications compared with the original study (Anderson & Maxwell, 2016; Bonett, 2008; syntax is available on the OSF, https://osf.io/r659c/). These CIs informed whether the replication effect sizes, $r$, were significantly larger or smaller than the original study’s results.

### Results

The original and replication study regression results are presented in Table 1. For each of the four outcome variables, we present the standardized beta and $p$ value for the regressions. Table 2 shows each study’s descriptive statistics for gender, race, and the mean and standard deviation for self-esteem and each of the four outcome variables. Table 3 shows the effect size differences between the original and replication studies and their 95% CIs.

<table>
<thead>
<tr>
<th>Study</th>
<th>Replication $r$</th>
<th>Original $r$</th>
<th>Difference</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU-Sp16</td>
<td>-0.02</td>
<td>-0.33</td>
<td>-0.31</td>
<td>[-0.59, -0.01]</td>
</tr>
<tr>
<td>BYU-WI17</td>
<td>-0.19</td>
<td>-0.33</td>
<td>-0.14</td>
<td>[-0.42, 0.15]</td>
</tr>
<tr>
<td>Gordon</td>
<td>-0.30</td>
<td>-0.33</td>
<td>-0.03</td>
<td>[-0.31, 0.25]</td>
</tr>
<tr>
<td>IIT-Sp16</td>
<td>-0.24</td>
<td>-0.33</td>
<td>-0.09</td>
<td>[-0.35, 0.18]</td>
</tr>
<tr>
<td>IIT-Sp17</td>
<td>-0.17</td>
<td>-0.33</td>
<td>-0.16</td>
<td>[-0.43, 0.12]</td>
</tr>
<tr>
<td>MSU</td>
<td>-0.11</td>
<td>-0.33</td>
<td>-0.22</td>
<td>[-0.43, 0.01]</td>
</tr>
<tr>
<td>SAU</td>
<td>-0.24</td>
<td>-0.33</td>
<td>-0.09</td>
<td>[-0.37, 0.20]</td>
</tr>
</tbody>
</table>

**Note.** BYU = Brigham Young University–Idaho, Rexburg, ID; Gordon = Gordon College, Wenham, MA; UT = Illinois Institute of Technology, Chicago, IL; MSU = Michigan State University, East Lansing, MI; SAU = Southern Arkansas University, Magnolia, AR.
Opportunity to Express Self

Consistent with the original study, all seven replications showed that self-esteem was not a significant predictor of participants seeing Facebook as enabling them to express themselves. Five of the seven studies showed an effect size descriptively smaller than the original study (.06 to .12 vs. .15), but all 95% CIs for the effect size difference included zero, indicating that the differences in magnitude between the original and replication studies were not significantly different than zero. Even though the effect size meta-analysis revealed that the point-estimate meta-analytic effect size of the seven replication studies, $r = .08, p = .021$, was statistically different from zero, and the 95% CI and prediction interval (PI) indicated that future studies would show an effect size between .01 and .14 (smaller than the original), all individual replications found regression coefficients not significantly different from zero. A forest plot of the effect size estimates is presented in Figure 1. The between-study variance in the replication studies did not appear to be heterogenous.\(^7\) $Q(df = 6) = 4.75, p = .576; T^2 = 0, 95% CI [0, .03]; I^2 = 0%, 95% CI [0%, 79%]. The FSN was three studies. Effect size differences between the replications and the original study were small.

Opportunity to Connect With Others

Contrary to the results of the original study, six of the seven replication studies did not find self-esteem to be a significant predictor of opportunity to connect. It is worth noting that the original study obtained a $p$ value of .05, and $p$ values between .04 and .05 have been demonstrated to be relatively more likely in the case of a true null hypothesis than a false one (Lakens & Evers, 2014; Masicampo & Lalande, 2012). In all but one of the replications, the direction of the effect was opposite of the original study. Two of the replications found an effect size descriptively similar to the original study, with one of these in the opposite direction (.21 to .24 vs. -.22); the remainder found effect sizes descriptively smaller than the original. Further, these descriptive differences were generally statistically significant: Five of the seven replications had effect sizes significantly smaller from the original study, as evidenced by 95% CIs that did not include zero. The point-estimate of the meta-analytic effect size was .09, 95% CI [-.01, .18], 95% PI [-.09, .26], $p = .065$. A forest plot is presented in Figure 2. The replication between-study variance showed limited evidence of heterogeneity:

\[^6\]Because of the relatively small sample sizes, the effect size differences are wide, and so these results are interpreted with caution. We further note that these nonsignificant effect size differences are not sufficient evidence for effect size equivalence between the original and replication studies (Anderson & Maxwell, 2016; Goal 6), which would require a stronger burden of proof (an equivalence test) than non-significance implies.

\[^7\]Heterogeneity statistics show considerable bias with small numbers of studies, so should be done with caution (Borenstein et al., 2009; von Hippel, 2015). We present heterogeneity statistics, but refrain from making conclusive interpretation.
heterogeneity, $Q(df = 6) = 10.79, p = .095$; $T^2 = .006, 95\% CI [0, .09]$; $I^2 = 44.39\%, 95\% CI [0\%, 91.69\%]$. The FSN was 5 studies.

**Self-Disclosure Safety**
Consistent with the original study’s findings, five of the seven replications found self-esteem to be a significant predictor of perceptions that self-disclosure on Facebook was safer than in FTF interactions. Three of these five had effect sizes descriptively similar in size and direction as the original (-.28 to -.34 vs. -.31), and two had descriptively larger effect sizes (-.40 to -.45). However, these descriptive differences in magnitude were generally not statistically significant. Six of the seven replications had effect size differences from the original that were not significantly different from zero. The point-estimate of the meta-analytic effect size was 95\% CI [-.24, -.15], 95\% PI [-.54, -.03], $p < .001$. The results are presented as a forest plot in Figure 3. The between-study variance showed some evidence of heterogeneity, $Q(df = 6) = 18.69, p = .005$; $T^2 = .02, 95\% CI [0, .15]$; $I^2 = 71.76\%, 95\% CI [27.06\%, 94.69\%]$. The FSN was 133 studies.

**Self-Disclosure Advantages**
Four of the seven replication studies were consistent with the original study and showed self-esteem to be a significant predictor of perceptions that Facebook was advantageous for self-disclosure compared to FTF. The effect sizes of all studies were descriptively less than or equal to the original (-.02 to -.30 vs. -.30). Similarly to self-disclosure safety, though, the effect size differences comparing six of the seven replications to the original were not significantly different from zero. The point estimate of the meta-analytic effect size was -.16, 95\% CI [-.23, -.10], 95\% PI [-.24, -.08], $p < .001$. A forest plot is presented in Figure 4. The variance measures showed little evidence of heterogeneity, $Q(df = 6) = 5.81, p = .445$; $T^2 = 0, 95\% CI [0, .03]$; $I^2 = 6.08\%, 95\% CI [0\%, 79.94\%]$. The FSN was 36 studies.

**Discussion**
The current study explored the results of a recent effort to replicate findings from Forest and Wood’s (2012, Study 1) study of self-esteem as a predictor of Facebook users’ perceptions of the site’s usefulness for self-expression, self-disclosure, and connection with others. The goal of the current research was to help better estimate the robustness of the original study’s effects, and we provide mixed evidence in favor of the original study’s findings and suggest the need for further testing.

The replications supported the original study’s finding that self-esteem was not a significant predictor of perceptions that Facebook provided opportunities to express the self, with all studies having 95\% CIs that include zero. The effect sizes were mostly smaller than the original, the summary effect size was about half of the original’s effect size, and the PI [.01, .14] showed that 95\% of future studies would find an effect size smaller

<table>
<thead>
<tr>
<th>Study</th>
<th>Weight</th>
<th>Effect Size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU–Sp16</td>
<td>13.55%</td>
<td>-0.08 [-0.13, 0.28]</td>
</tr>
<tr>
<td>BYU–Wi17</td>
<td>13.55%</td>
<td>-0.21 [-0.40, -0.00]</td>
</tr>
<tr>
<td>Gordon</td>
<td>12.97%</td>
<td>-0.34 [-0.52, -0.13]</td>
</tr>
<tr>
<td>IIT–Sp16</td>
<td>14.72%</td>
<td>-0.45 [-0.58, -0.29]</td>
</tr>
<tr>
<td>IIT–Sp17</td>
<td>13.76%</td>
<td>-0.40 [-0.56, -0.21]</td>
</tr>
<tr>
<td>MSU</td>
<td>18.41%</td>
<td>-0.28 [-0.37, -0.18]</td>
</tr>
<tr>
<td>SAU</td>
<td>13.03%</td>
<td>-0.30 [-0.49, -0.09]</td>
</tr>
</tbody>
</table>

Summary Effect Size: -0.28 [-0.40, -0.15]

Forest plot for meta-analysis of CREP replication studies showing effect sizes, weights, and 95% confidence intervals. The effect sizes represent Self-Disclosure Safety as predicted by self-esteem. Signs represent the direction of the relationship. Summary effect size includes prediction interval represented by a dashed line. BYU = Brigham Young University–Idaho, Rexburg, ID; Gordon = Gordon College, Wenham, MA; IIT = Illinois Institute of Technology, Chicago, IL; MSU = Michigan State University, East Lansing, MI; SAU = Southern Arkansas University, Magnolia, AR.

<table>
<thead>
<tr>
<th>Study</th>
<th>Weight</th>
<th>Effect Size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYU–Sp16</td>
<td>10.18%</td>
<td>-0.02 [-0.23, 0.19]</td>
</tr>
<tr>
<td>BYU–Wi17</td>
<td>10.18%</td>
<td>-0.19 [-0.38, 0.02]</td>
</tr>
<tr>
<td>Gordon</td>
<td>9.06%</td>
<td>-0.30 [-0.49, -0.09]</td>
</tr>
<tr>
<td>IIT–Sp16</td>
<td>13.04%</td>
<td>-0.24 [-0.40, -0.06]</td>
</tr>
<tr>
<td>IIT–Sp17</td>
<td>10.63%</td>
<td>-0.17 [-0.36, 0.03]</td>
</tr>
<tr>
<td>MSU</td>
<td>37.73%</td>
<td>-0.11 [-0.21, -0.01]</td>
</tr>
<tr>
<td>SAU</td>
<td>9.17%</td>
<td>-0.24 [-0.44, -0.02]</td>
</tr>
</tbody>
</table>

Summary Effect Size: -0.16 [-0.23, -0.10]

Forest plot for meta-analysis of CREP replication studies showing effect sizes, weights, and 95% confidence intervals. The effect sizes represent Self-Disclosure Advantages as predicted by self-esteem. Signs represent the direction of the relationship. Summary effect size includes prediction interval represented by a dashed line. BYU = Brigham Young University–Idaho, Rexburg, ID; Gordon = Gordon College, Wenham, MA; IIT = Illinois Institute of Technology, Chicago, IL; MSU = Michigan State University, East Lansing, MI; SAU = Southern Arkansas University, Magnolia, AR.
Facebook and Self-Esteem Meta-Analysis | Leighton, Legate, LePine, Anderson, and Grahe

than the original study’s, all factors indicating the presence of publication bias in the original study. The PI came close to, but did not include, zero so it may be that there is an effect, but small enough to be difficult to detect. The FSN analysis, which indicated that only five unreported studies could reduce the results of the meta-analytic effect size $p$ value to nonsignificant, led us to be confident that future replications would find the same lack of an effect as our replications.

Another finding consistent with the original was that lower self-esteem was a significant predictor of perceiving Facebook as a safer place to self-disclose than FTF. Most of the replications found this result, although two of the seven studies had effects whose CIs included zero. The point estimate of the effect size in the replications (-.28) was close to the original (-.31). The 95% PI [-.40, -.15] indicated that future studies would be likely to find such an effect as well. These results also seemed to be somewhat robust, as indicated by a high FSN (133). We can conclude with some confidence that individuals with low self-esteem feel safer self-disclosing on Facebook than in FTF interactions, and that the size of this effect is considerable.

The replication studies were more mixed in their support of the original study’s finding that self-esteem was a predictor of the perception that Facebook is advantageous for self-disclosure over FTF. Only four of the seven replication studies showed such an effect, with the other three showing nonsignificant effects. All of the replications showed effects in the same direction as the original, but with widely varying and smaller effect sizes than the original (-.02 to -.30 vs. -.33), the latter finding consistent with the original study’s larger susceptibility to publication bias than replication studies. Nevertheless, the point-estimate of the effect size in the replications of -.16 was significantly different from zero, and the PI [-.24, -.08] indicated that future studies are likely to find such an effect. In addition, the moderately large FSN (36) indicated that the findings were relatively stable. Future studies seem likely to find that self-esteem would predict users’ perception that Facebook was more advantageous for self-disclosure than FTF, but the effect should be smaller in size than the original study’s finding.

The replication studies and their meta-analysis seem to contradict the original study’s findings that low self-esteem was a significant predictor of perceptions that Facebook has opportunities to connect with others. The summary estimate of the effect size was opposite in direction to the original in six of the seven replications and nonsignificant in all but one. However, the meta-analytic effect size was .09 and significantly different from zero. We believe that it will be unlikely that future studies will find an effect similar to the original, supported by the 95% PI of [-.07, .27], which includes zero. These findings also seemed somewhat unstable, as shown by the low FSN (11 studies).

In summary, this meta-analysis of the CREP replications of Forest and Wood’s Study 1 (2012) found that future researchers can be relatively confident of finding that low self-esteem predicts perceptions that Facebook is a safer and more advantageous place to self-disclose than FTF interactions. Our results also align with the original study’s finding that self-esteem does not relate to perceiving opportunities to express oneself on Facebook. However, we are less confident that self-esteem will be shown to predict perceptions of Facebook as having opportunities to connect with others, as the original study found.

Implications of the Present Research
When choosing what information to self-disclose, people engage in a benefits-risk analysis to maximize the benefits of self-disclosure (e.g., social support) and minimize the risks (e.g., vulnerability; Bazarova & Choi, 2014). Self-disclosures on Facebook can be made without some of the immediate indicators of disapproval present in FTF interactions, and thus increase the tendency to self-disclose (Hollenbaugh & Ferris, 2014). This perspective is supported by the present research. Our meta-analysis confirmed the original study’s findings that, when compared with individuals high in self-esteem, those with low self-esteem saw Facebook as a safer and more advantageous way of self-disclosing relative to FTF interactions.

The present research also provides some support for social compensation theory (McKenna & Bargh, 2000; Wilson, Gosling, Graham, 2012). This theory suggests that, for those with lower self-esteem, the anxiety provoked by FTF interactions can be somewhat mitigated in online interactions. However, the CREP studies did not include a measure of FTF vs. online anxiety, making this an interesting direction for future research.

Eşkusu, Hoşoğlu, and Rasmussen (2017) recently suggested that social compensation theory might predict that those with lower self-esteem may use Facebook to express themselves and connect with others rather than the more anxiety-provoking
FTF. Their study found a significant negative relationship ($r = -0.11$) between self-esteem and using Facebook for acquaintance-related functions (e.g., being known by others and meeting new people), suggesting that those lower in self-esteem used Facebook for connection and expression. This finding runs contrary to the results of our meta-analysis, as our effect size estimates for connection and expression are positive not negative, and are weak and inconsistent. This suggests a number of possibilities, one of which is that their findings may only generalize to Turkish university students, possibly due to a move in the United States and United Kingdom away from Facebook and toward Instagram and Snapchat among those 13–24 years olds (eMarketer, 2016, 2017). It is also possible that more collectivist cultures, like Turkey (Osyerman, Coon, & Kemmelmeier, 2002), with their emphasis on group-based self-perception, may prompt people to use Facebook for different reasons than those in individualist cultures. In more collectivist cultures, people with lower self-esteem may use Facebook to connect and express themselves to enhance their group membership. In contrast, in an individualist culture, with its emphasis on individual self-concept, people with greater self-esteem may see Facebook as a place to express their individual qualities and connect with other individuals. These hypotheses remain to be tested across cultures by future researchers.

Another possible explanation for our findings is that differences between the original and replication results might be related to changes in social media usage patterns from 2012 to 2016. By the time the replications occurred in 2016–17, both Snapchat and Instagram were among a new crop of social media outlets for US and UK participants that challenged Facebook as the preferred social networking site for the age cohort of the participants in this research (eMarketer, 2016, 2017). More specifically, among Facebook, Twitter, Instagram, and Snapchat, self-expression was recently found to be a significant predictor of usage only on Instagram and Snapchat among college-aged participants, and social interaction (connection in the terminology of Forest and Wood, 2012) was a greater motivation for use of Instagram and Snapchat than Facebook and Twitter (Alhabash & Ma, 2017). Participants in our replication studies might have been implicitly comparing Facebook usage to Snapchat and Instagram when rating its usefulness for self-expression and connection with others, whereas these platforms would not have been a consideration for participants in Forest and Wood’s (2012) study. Thus, future researchers should take into account changes in usage patterns among the platforms in designing research on social media usage, motivations, and intrapersonal benefits.

**Limitations and Caveats**

A major limitation in the present research is the relatively small sample of studies in the CREP project. Seven studies provide important data about the replicability of a finding, but severely limit the inferences we feel confident to draw from the data. For example, heterogeneity measures are known to be biased for meta-analysis involving small numbers of studies (Borenstein et al., 2009; von Hippel, 2015). Consequently, we are reluctant to draw conclusive inferences from the heterogeneity statistics.

Another impediment to drawing better conclusions relates to some of the variations in the studies. For example, not all studies posted analysis scripts or narratives to help us determine such things as missing data handling, composite score calculations, data exclusions, etc. Data were not always collected or stored consistently (e.g., race collected in some but not all studies; individual item-level data were not always stored). These issues indicate the need for more specific instructions for contributors that are specific to the study being replicated to ensure consistent data handling and documentation.

We are also hesitant to propose moderators of the effects observed in the replication studies even though we know there are methodological and procedural differences between the studies (i.e., in-person vs. online; individual participants vs. groups; wording on questionnaires; additional measures). Because each of these potential moderating factors occurred in only one or two of the seven replications, we chose not to explore these issues in more depth. Future researchers designing coordinated, large-scale replication studies may want to design controlled tests of some of these factors.

When comparing the effect sizes of the four outcome variables between the original study and the replication studies, we are constrained in our inference or conclusions by relatively wide CIs. This is primarily caused by the small sample size of the original study, as well as the rather small sample sizes of the replication studies. Generally, the sample sizes required for precision in comparing the difference in effect sizes will be larger than for judging simple significance. Future large-scale
replication attempts should consider increasing sample size to attain adequate power and precision for inferences to be made more confidently (see Anderson & Maxwell, 2017 for a comparison of sample size planning for replication studies).

Conclusion
The awareness that some, if not many, single-study results in psychology may not be replicable has spurred a new interest in replication studies. Although single-study replications can help lend confidence to our conclusions about the veracity of the replicated study, the use of larger-scale, multiple, independent replication attempts can provide more and higher quality data. These data can be aggregated and used to more accurately estimate the effect size likely to be found in future studies.

We are encouraged that the emerging meta-science methods being used by large scale replications such as the Reproducibility Project for Psychology, Many Labs, and CREP projects will begin to contribute to greater confidence in our conclusions from findings that are highly cited in our top journals. Replication is neither a silver bullet, nor is it insignificant. It has been called “the demarcation criterion between science and nonscience” (Braude, 1979, p. 2) and “the coin of the scientific realm” (Loscalzo, 2012, p. 1211). It may not advance science by leaps and bounds, but it helps us move incrementally in the direction of truth.

References
Meta-analyses can be biased in small studies. BMC Medical Research Methodology, 15, 35. https://doi.org/10.1186/s12874-016-0024-z


Author Note. Dana C. Leighton, Behavioral and Social Sciences Department, Southern Arkansas University; Nicole Legate, Department of Psychology, Illinois Institute of Technology; Sara LePine, Department of Psychology, Gordon College; Samantha E. Anderson, Department of Psychology, University of Notre Dame; Jon Grahe, Department of Psychology, Pacific Lutheran University.

Dana C. Leighton is now at Psychology Department, Texas A&M University–Texarkana.

The authors acknowledge the students and faculty mentors of the research groups that conducted the replication studies: Bradford J. Wiggins, Isaac Pfleger, Abigail Olsen, Kendra Tilley, Katelyn Haar, Victoria Boomhower, Kylie Harris, Jared Roy Foster, Christopher Hooker, Brayden Decker, Michael Alexander Retallick, and Stephanie Molisi from Brigham Young University, Idaho; Stephanie Nicholson, Kaylee Seward, J.P. Gerber, and Sara LePine from Gordon College; Rafal Wojnowicz, Nicole Legate, Zoë Mandelski, Alexis Renk, Cynthia Jocelyn Chavez, Jacqueline Suriano, Sonia Kamdar, Jonathan Tacuri, Tasheica Lindsay, Sean Isaac Rafajko, Sunny Shah, Adecena Ahmed, Nadyah Mohiuddin, Aume Waheed, and Elizabeth Howard from Illinois Institute of Technology; Carol Tweten, Richard E. Lucas, Katie Solomon, and Jaazaniah Catterall from Michigan State University; and Delora Everett, Dana C. Leighton, and Megan Nicole Glass from Southern Arkansas University. The authors also acknowledge Psi Chi and the Center for Open Science for the CREP Research Awards. Special thanks to Psi Chi Journal reviewers for their support.

This manuscript qualifies for an Open Materials badge and an Open Data badge; the materials and data are available at https://osf.io/yb9cx/. This manuscript qualifies for a Preregistration badge; the data collection and data analysis methods were preregistered at each individual study’s OSF page (for links to each project see https://osf.io/yb9cx/). This manuscript qualifies for a replication badge; it replicates a study reported by Forest and Wood (2012).

Correspondence regarding this article should be addressed to Dana C. Leighton, Psychology Department, Texas A&M University–Texarkana, TX 75503. E-mail: dleighton@tamut.edu
Disclosure of Diagnosis Increases Positivity of Social Responses to Autistic Individuals
Matthew J. Bolton and Lara K. Ault* Saint Leo University

ABSTRACT. Individuals with disabilities, disorders, and neurological conditions continue to be ostracized by society. Recent work has indicated that autistic college students, concerned about their peers’ acceptance of and responses to their autism-related behavior, may fear disclosing their condition. The present study examined college student and nonstudent attitudes toward individuals with autism spectrum conditions (ASC), focusing on participants’ perceptions of these individuals based on their own knowledge of and interpersonal experiences with autism, and awareness of diagnosis when interacting with autistic individuals. Participants (n = 176) responding to an online survey read a vignette in which they worked on a project with someone exhibiting unusual behavior. They either knew or were unaware of the ASC diagnosis via random assignment. They then indicated positive and negative affective, behavioral, and cognitive responses to the vignette character. Overall, results revealed a pattern of familiarity, \( r(144) = .25, p = .002 \), and similarity, \( r(152) = .19, p = .017 \), correlating with positive cognitions about the autistic person. In addition, experience and diagnosis awareness interacted, \( F(1, 146) = 9.84, p = .002, \eta^2_p = 0.06, power = .88 \), such that those with first-hand, interaction-based experience with ASC, who knew the diagnosis, showed fewer negative behavioral responses, \( F(1, 146) = 9.84, p = .002, \eta^2_p = 0.06, power = .88 \). For those unfamiliar with ASCs, diagnosis awareness did not reduce negativity. Implications and future directions are discussed.

Neurodiverse individuals—those with mental illness and neurological conditions or disabilities—are typically viewed by wider society as inferior (Foerschner, 2010). Reports by journalistic outlets worldwide suggest that poor treatment of these populations often extends into instances of neglect and abuse (Brown, 2016; Jensen, 2016; Leid, 2016; Lohr, 2017; Manna, 2016; Milligan, 2016; Ryan, 2015; Weiss, 2017; Winsor & Jacobo, 2017). People are more likely to avoid socializing with those who are neurologically different from themselves than they are to avoid interacting with physically disabled individuals; this finding has persisted across time and not only affects adults but also children and adolescents (Borinstein, 1992; Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000; Gordon, Tantillo, Feldman, & Perrone, 2004; Karnilowicz, Sparrow, & Shinkfield, 1994; Nowicki, 2006; Thomas, 2000; Tringo, 1970).

Such blatant ostracism has implications for the
neurodiversity has begun to change the way people view neurodiverse individuals simply (Welin, 2012, p. 24). Because the perspective holds that these conditions (e.g., autism, ADHD, dyslexia, dyspraxia, and synesthesia) are not necessarily disabling, but rather representative of individual differences along a continuous spectrum of human functioning (Baron-Cohen, 2000, 2017; Beardon, 2007; Wing, 1988, 1997). Neurodiversity considers these differences as human beings; it creates for them a sense of internalized shame, which “diminishes self-esteem and causes self-doubt regarding whether one can live independently, hold a job, earn a livelihood, and find a life mate” (Corrigan, 2002, p. 223).

Negative attitudes toward autism in society today result in people with the condition forming fewer friendships and maintaining smaller social support groups than their typically developed peers (Nevill & White, 2011). Recent years have seen individuals with autism spectrum conditions (ASC) combatting negative societal tendencies by engaging in self-advocacy and promoting the growth of the neurodiversity perspective (Autistic Self Advocacy Network, 2017; Autistic UK, 2017). The neurodiversity perspective maintains that neurological conditions (e.g., autism, ADHD, dyslexia, dyspraxia, and synesthesia) are not necessarily disabling, but rather representative of individual differences along a continuous spectrum of being (Baron-Cohen, 2000, 2017; Beardon, 2007; Wing, 1988, 1997). Neurodiversity considers these conditions to be, collectively, manifestation of broad differences in human functioning (Baron-Cohen, 2017) “that should be tolerated and respected in the same way as other human differences” (Jaarsma & Welin, 2012, p. 24). Because the perspective inherently views neurodiverse individuals simply as different, as valuable members of society, and not as any less than their typically developed peers, neurodiversity has begun to change the way people talk about autism. Kenny et al. (2016) investigated the language U.K. residents use in reference to the condition. In surveying individuals with the condition, their parents and friends, and professionals working in autism, Kenny and colleagues found little consensus for any one term, whether it was rooted in “person-first” or “identity-first” language (e.g., “person with autism” or “autistic person/individual”). People with the condition generally preferred identity-first language, whereas friends and family used a mix of terms and professionals preferred person-first language. Hence, in an effort to respect this matter, the authors reporting here use a variety of autism reference terms in their work.

Rationale for the Present Study
Seeking to destigmatize autism in society, this study uses the aforementioned multiple terms of reference (that is, person-first and identity-first language) and additionally follows other researchers (Aylott, 2009; Baron-Cohen, Golan, Chakrabarti, & Belmonte, 2008; Bölte & Hallmayer, 2011; Clare & Woodbury-Smith, 2009; Lai, Lombardo, Chakrabarti, & Baron-Cohen, 2013) in adopting ASC terminology to refer to the myriad labels historically associated with autism (e.g., autism spectrum disorder, classic autism, Asperger’s Syndrome, and pervasive developmental disorder among others; American Psychiatric Association, 1994, 2013; ICD-10, 2017). Although condition is in some respects a medical term, it also reflects a natural state of being (in this case, an autistic “being”) and promotes the idea of normative and positive difference rather than negative abnormality (Baron-Cohen, 2017; TheResearchAutism, 2012). Whereas the implication of widely accepted disorder-based terminology and further, the concept of “being disordered,” is that an individual is flawed, “having a condition” may be less stigmatizing while still leaving appropriate room for the idea of disability in instances where interventions could meaningfully improve quality of life (Baron-Cohen, 2017). In sum, ASC terminology supports the idea of autism as a normative difference in human functioning, and therefore aligns with the concepts of neurodiversity.

One potentially problematic matter that may be of concern for individuals on the autism spectrum involves those who are newly enrolled in college: these students may fear disclosing their diagnosis to others (Huws & Jones, 2008). This fear works to counteract the increases in self-esteem and sense of belonging that researchers have reported typically arise when an individual is part of a college
community (Hart, Grigal, & Weir, 2010), and can potentially negatively impact the individual student’s self-perception and feelings of intrinsic worth (Nevill & White, 2011). The result is that the individual’s concealable stigma—that is, in this case, their “autisticness”—becomes a point of shame and social humiliation, which they feel must remain hidden from others. This, in turn, subsequently negates their academic success (Howlin, Mawhood, & Rutter, 2000). In an effort to assess whether the aforementioned potential fear of diagnosis disclosure is warranted, the present study sought to examine the social perceptions of college students toward their student peers and others diagnosed with ASC.

Aims of the Present Study

Two previous studies on autism and peer acceptance, by Nevill and White (2011) and by Matthews, Ly, and Goldberg (2015), inspired this work. Nevill and White found that interaction with autism-diagnosed family members (in their study, first-degree relatives) was related to a higher degree of openness and less cognitive negativity to the idea of interaction with individuals on the autism spectrum. Matthews et al. found that students who were given diagnosis information when reading about a vignette character were more cognitively and behaviorally positive toward individuals on the spectrum than those not given diagnosis information. The present study combined the concepts from these two studies and aimed for a generalized replication of their results.

First, in examining the effect of awareness of diagnosis vs. nonawareness on attitude scale scores, it was predicted that a diagnostic label of autism would influence participants’ attitudes (their affective, behavioral, and cognitive responses) toward a person exhibiting symptoms of the condition. Next, in examining the effect of having experience (vs. no experience with autistic individuals) on attitude scale scores, a positive correlation was predicted between a person having first-hand experience with autism and exhibiting acceptance of autistic behavior. Possible differences in perceptions across the student and nonstudent participant groups were expected, but no particular direction was specified.

Method
Participants

Participants (N = 176) were college student (n = 100) and nonstudent (n = 76) adults (the nonstudents were recruited for comparison purposes). They were predominantly women (n = 124, 70.5%), mean age 29.4 (SD = 13.6). The sample was primarily European American (n = 149, 84.7%). The remaining participants included 10 or fewer each of Asians (n = 10, 5.7%), Hispanics (n = 10, 5.7%), African Americans (n = 2, 1.1%), Latino/a (n = 1, 0.6%), or another group (n = 4 unknown ethnicities, 2.3%). Students included first-year students (n = 18, 10.2%), sophomores (n = 13, 7.4%), juniors (n = 20, 11.4%), seniors (n = 21, 11.9%), master’s degree students (n = 22, 12.5%), and PhD candidates (n = 6, 3.4%). Participants were recruited by way of in-class announcements, peer-to-peer interpersonal interaction, e-mail, and social media distribution for an anonymous, online survey. The chosen sampling methodology was one of convenience, with a snowball design.

Procedure

Participants volunteered by following an online link to complete a survey via Qualtrics. After consenting, participants were randomly assigned to one of two conditions. In both conditions, participants read a vignette about a classmate who demonstrated seemingly odd behavior, with whom they were instructed to imagine working on a project. In one condition, an autism diagnosis was revealed; in the other, diagnosis was not revealed. Participants completed a variety of individual difference measures and answered questions directly related to how they would respond to the person in the vignette. Potential gender biases were controlled for by giving the vignette character a gender-neutral name (i.e., Jordan). All procedures and survey measures were approved by the Institutional Review Board at Saint Leo University.

Measures included the following, consistently presented in the following order: Demographics, a short version of the Autism-Spectrum Quotient (AQ-S; Hoekstra et al., 2011, adapted from the Autism-Spectrum Quotient, AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Chubley, 2001), Multidimensional Attitudes Scale Toward Persons With Disabilities (MAS; Findler, Vilchinsky, & Werner, 2007), and a modified version of the Autism Knowledge Questionnaire (AKQ; Kuhn & Carter, 2006). The only manipulation of materials was the random assignment of the vignette character’s diagnosis. Data were excluded when participants had more than 10% missing data. In addition to the formal measures detailed below, participants...
were asked demographic questions including age, sex, whether they were a college student or not and, if so, what their major was, and whether they had experience with autistic individuals (this question had a yes/no response which was used as a grouping variable). Participants were not explicitly asked if they were diagnosed with autism.

Materials
Autism-Spectrum Quotient-Short (AQ-S). This measure was used to compare participants’ trait similarity to those with ASCs. The AQ-S is a 28-item questionnaire on which participants indicate their levels of agreement with different statements relating to individual difference on a 4-point Likert-type scale from 1 (strongly agree) to 4 (strongly disagree). The AQ was originally developed as an adult-oriented, nondiagnostic, self-report measure of autistic characteristics across five dimensions (social skill, attention-switching, attention to detail, communication, and imagination). Higher scores indicate than an individual possesses more characteristics of autism. This study used the abridged version, shortened by Hoekstra et al. (2011), as a measure of participants’ cognitive similarity to individuals with ASCs (it was presumed that participants with higher trait levels would be able to cognitively empathize with autistic individuals more so than participants with lower levels). Participants’ average AQ-S score was 65.42 (n = 176; SD = 6.17). The AQ-S scores had poor reliability in this study, with a Cronbach’s alpha of .33. This is likely a result of the short length of some of the AQ-S subscales (Hoekstra et al. 2011, S. Baron-Cohen, personal communication, 2017). Concerns with attrition guided the decision to use the abridged version.

Multidimensional Attitudes Scale Toward Persons With Disabilities (MAS). Measuring three of the study’s primary dependent variables, the MAS measures attitudes across the psychological dimensions of affect, behavior, and cognition. Participants were asked to imagine how likely they would be to respond with certain thoughts, feelings, and acts during and/or after the interaction depicted in the vignette. Sixteen affect-oriented questions include such feelings as tension, helplessness, serenity, and shyness. The behavior-oriented questions ask how likely respondents would be to engage in each of seven behaviors such as “Get up and leave” and “Start a conversation.” Finally, the 10-item cognition-oriented subscale asks respondents the likelihood they would experience each of 10 thoughts surrounding the interaction. Sample cognitions include “We may get along really well” and “Why not get to know him/her better?” All items are scored on a scale ranging from 1 (not at all) to 5 (very much). Negative items are reverse-coded, and items for each subscale averaged, resulting in three subscale scores that range from 1 to 5; these are averaged across all items in each subscale to create three primary outcome variables: (a) affective responses, (b) behavioral responses, and (c) cognitive responses. Lower scores indicate more positive acceptance of the vignette character. Average MAS scores were 2.63 (affect; SD = 0.57), 2.08 (behavior; SD = 0.66), and 2.88 (cognition; SD = 0.69). In the diagnosis condition (n = 77), Cronbach’s alpha reliabilities across the three subscales were .57 (affect), .49 (behavior), and .85 (cognition). In the no-diagnosis condition (n = 78), these were .68, .49, and .88, respectively.

Autism Knowledge Questionnaire (AKQ). This was a measure of familiarity with, or accurate knowledge about, autism. The AKQ was shortened for this study, from 41 to 20 items, to remove open-ended questions with subjective answers. Items, then, are objectively scored, based on accurate responses to questions with known answers. Participants were asked to respond “true,” “false,” or “don’t know.” Sample statements include “There is currently no medical test to diagnose autism” and “Over half of the number of children with autism have been found to be the result of bad parenting.” Each correct response is worth 1 point, whereas incorrect and “don’t know” responses are worth 0 points. Points were summed, divided by 20, and multiplied by 100 to yield a percentage score. Average score on the AKQ was 12.33 (SD = 3.61). Scores on the AKQ were adequately reliable in this study, with a Cronbach’s alpha of .74.

Results
Analyses showed a positive correlation between time spent with autistic individuals and fewer negative cognitions, r(144) = .25, p = .002, regardless of diagnosis disclosure in the vignette. Further, those who reported more autistic traits in themselves (via the AQ-S) responded with fewer negative cognitions to individuals on the autism spectrum, r(152) = .19, p = .017. Table 1 shows the correlations between autism knowledge, traits, and MAS scores.

Testing with a 2 (diagnosis awareness: yes or no) x 2 (experience with autism: yes or no) between-groups Multivariate Analysis of Variance (MANOVA; Tables 2 and 3), there was no main effect of diagnosis awareness on any of the three
Diagnosis Disclosure and Responses to Autism

Bolton and Ault

MAS response types (all $p$s > .10, all $\eta^2$ > .01). A one-way MANOVA with student status as the grouping variable revealed no difference between students and nonstudents in their time spent ($p = .956$, $\eta^2 < .001$) with autistic individuals, nor did students differ from nonstudents in their reactions to these individuals (Affect, $p = .196$, $\eta^2 = .01$; Behavior, $p = .195$, $\eta^2 = .01$; Cognition, $p = .218$, $\eta^2 = .01$). However, the two-way MANOVA detected a main effect reflecting differences in cognitive responses for those who reported experience with autism compared to those without experience, $F(1, 146) = 9.84$, ($M_{\text{experience}} = 2.71$; $M_{\text{no experience}} = 3.10$); $p = .002$, $\eta^2 = 0.07$, power = .88. Given this small effect size, Bonferroni-adjusted comparisons between experience indicated a 95% CI of [2.93, 3.32]. Accuracy of autism knowledge, as measured by the AKQ as an indicator of understanding the spectrum, also differed by experience, $F(1, 143) = 25.89$, ($M_{\text{experience}} = 66.84$; $M_{\text{no experience}} = 52.02$); $p < .001$, $\eta^2 = 0.15$, power = .73. Again, Bonferroni-corrected 95% CI [63.56, 70.11].

Perhaps the most notable of the two-way MANOVA findings is that first-hand experience with ASCs significantly interacted with diagnostic label for behavioral responses, $F(1, 146) = 5.52$, $p = .02$, $\eta^2 = .04$, power = .65. Specifically, experience correlated with less behavioral negativity in the diagnosis ($M = 1.84$, $SE = 0.09$; 95% CI [1.66, 2.02]) than in the no-diagnosis condition ($M = 2.19$, $SE = 0.09$; CI [2.01, 2.37]), but responses across conditions did not differ for those without autism interaction experience ($p = .44$).

**Discussion**

Participants in this study who had real-life interaction experience with autistic individuals, and who indicated having familiarity with autism and awareness of the condition in their social interactions, were less cognitively negative compared to participants who lacked such experience. Moreover, this study’s findings are similar to those reported by Nevill and White (2011) and Matthews et al. (2015). First, like Nevill and White, the present study found that time spent with people on the autism spectrum (defined in this study as experience with autism) correlated with fewer negative cognitive reactions to the vignette character. Next, like Matthews et al., the present study found that participants given a diagnostic label of autism were more positive in their responses to the vignette character.

Intriguingly, in contrast to Matthews et al., who found a relationship between positive social responses and lower participant-expressed autistic trait scores on the Broad Autism Phenotype Questionnaire (BAPQ; Hurley, Losh, Parlier, Reznick, & Piven, 2007), this study found that participants reporting more autistic traits in themselves (via the AQ-S) responded to a vignette character with fewer negative cognitions than those with lower AQ-S scores. The differing results between the two measures are likely due to subtle differences in the ways they were designed, including in the creators’ definition of the exact construct they respectively measure. Whereas the AQ variants are often administered in clinical populations (Woodbury-Smith, Robinson, & Baron-Cohen, 2005) and were designed to measure autistic traits which typically manifest in autistic individuals (Kanne, Wang, & Christ, 2012; Lundqvist & Lindner, 2017), the BAPQ was designed to measure traits that are qualitatively similar but nonetheless more mild, that may occur in nonautistic relatives of autistic individuals (Hurley et al., 2007).

The two-way MANOVA revealed that participants with previous autism experience who received diagnostic information in the vignette behaved,
by self-report of their own imagined behavior in a hypothetical social scenario, more positively toward the vignette character than those who did not have experience. Knowledge of diagnosis had no effect on behavior for participants who had no first-hand experience with autism. This suggests that the positivity observed in the diagnosis condition could be the result of societal norms and expectations, but that it could also be due to a deeper understanding of the characteristics of the vignette character as a result of previous real-life interaction experience.

The implication of this is that, when an individual lacks experience with, and thus understanding of, ASCs, the person may be influenced by social expectations and by misconceptions and stereotypes surrounding ASCs (e.g., that individuals with the condition are dangerous, that autism is a disease that may be somehow transmitted to others) which override the sense of obligation to social niceties.

People are influenced by those with whom they associate (Monahan, Steinberg, & Cauffman, 2009; Tomé, Matos, Simões, Diniz, & Camacho, 2012). Thus, given enough time, interaction experience may lend itself to some internalized, inherent understanding of autistic peers that helps nonautistic individuals to better imagine for themselves the difficulties and potential challenges faced by those with the condition. In so empathizing with autistic people, the interacting individuals become more accepting on a cognitive level. Those without experience may be unable, or at least less readily able, to imagine what it would be like if they themselves had an ASC, just as those who can see cannot accurately imagine what it is like to be blind or to have low vision, and autistic individuals may have difficulties cognitively empathizing with those not on the spectrum (Baron-Cohen, 1995). This inability to relate to autistic individuals, something Milton (2012) and Chown (2014) call the “double empathy problem,” warrants additional investigation into implicit prejudice and the perhaps unintentional stereotyping of individuals on the autism spectrum.

It would be interesting to investigate whether changing the condition disclosed in the vignette would change the outcome in exhibited attitude, as suggested in other work (Feldman & Crandall, 2007). The overall implication of the finding for behavioral, but not affective or cognitive, positivity is that, when people learn that a person has a particular diagnosis, they likely feel obligated to show at least some (outward) positivity toward the person, while still, perhaps, thinking negatively.

One particularly devastating aspect of the internalized stigma this negativity brings about is that it

### TABLE 3

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>Power</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclosure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>1</td>
<td>0.174</td>
<td>0.174</td>
<td>0.56</td>
<td>.46</td>
<td>.12</td>
<td>.04</td>
</tr>
<tr>
<td>Behavior</td>
<td>1</td>
<td>0.242</td>
<td>0.242</td>
<td>0.60</td>
<td>.44</td>
<td>.12</td>
<td>.04</td>
</tr>
<tr>
<td>Cognition</td>
<td>1</td>
<td>0.07</td>
<td>0.07</td>
<td>0.14</td>
<td>.71</td>
<td>.07</td>
<td>.01</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>1</td>
<td>0.710</td>
<td>0.710</td>
<td>2.3</td>
<td>.13</td>
<td>.32</td>
<td>.02</td>
</tr>
<tr>
<td>Behavior</td>
<td>1</td>
<td>1.24</td>
<td>1.24</td>
<td>3.1</td>
<td>.08</td>
<td>.41</td>
<td>.02</td>
</tr>
<tr>
<td>Cognition</td>
<td>1</td>
<td>4.6</td>
<td>4.6</td>
<td>8.84</td>
<td>.002***</td>
<td>.88</td>
<td>.07</td>
</tr>
<tr>
<td>Disclosure x Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>1</td>
<td>1.13</td>
<td>1.13</td>
<td>3.61</td>
<td>.06</td>
<td>.47</td>
<td>.03</td>
</tr>
<tr>
<td>Behavior</td>
<td>1</td>
<td>2.24</td>
<td>2.24</td>
<td>5.52</td>
<td>.02**</td>
<td>.65</td>
<td>.04</td>
</tr>
<tr>
<td>Cognition</td>
<td>1</td>
<td>0.585</td>
<td>0.585</td>
<td>1.26</td>
<td>.26</td>
<td>.20</td>
<td>.009</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>142</td>
<td>44.27</td>
<td>0.312</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>142</td>
<td>57.72</td>
<td>0.406</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>142</td>
<td>65.65</td>
<td>0.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>146</td>
<td>1,056.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>146</td>
<td>695.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>146</td>
<td>1,277.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .01.

**TABLE 3**

Multivariate Analysis of Variance Table

---

**SPECIAL ISSUE 2018**

**PSI CHI**

**JOURNAL OF PSYCHOLOGICAL RESEARCH**

COPYRIGHT 2018 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (SPECIAL ISSUE; VOL. 23, NO. 2/ISSN 2325-7342) 115
leaves people feeling inherently and intrinsically separate, as though they are not worthy of others’ time, or are not full members of society. Regardless of the amount of discrimination levied, the self-perception of being devalued and marginalized impacts one’s feelings of self-esteem and distress (Boyd, Ottingam, & Grajales, 2003). Stigma and associated emotions can contribute to a host of psychosocial issues such as problems in relationships with one’s family (Lefley, 1989), employment discrimination (Farina, Felner, & Boudreau, 1973), and general social rejection (Corrigan, Edwards, Green, Diwan, & Penn, 2001). Our results, however, as well as those of Nevill and White (2011), Matthews et al. (2015), and others, suggest a shift in attitude toward people with ASCs. This has been encouraged recently by the growth of the neurodiversity perspective (Baron-Cohen, 2017; Jaarsma & Welin, 2012), which puts forth two ideas: (a) that neurological conditions represent manifestations of individual difference along a normative bell curve, and (b) that neurodiverse individuals are different but not less than their typically developed peers. Although it is agreed by these authors that ASCs represent natural variation in human functioning and brain development, the fact remains that autism affects many individuals in ways that may significantly inhibit them in their inherent ability to function day-to-day. When the well-being of autistic individuals is meaningfully impacted, viewing their ASC as disabling may be helpful, appropriate, and even necessary, so that they may receive wanted and/or needed support (this is in agreement with the thinking of other neurodiversity-supporting researchers, e.g., Baron-Cohen, 2017, who endorsed the term disability for use “when the person falls below an average level of functioning in one or more psychological or physical functions, and where the individual needs support or intervention” p. 3). Individuals whose manifestations of autism suppress their ability to function often need substantial living assistance and support; appropriate services are typically rendered only if the person in need possesses a medical diagnosis/label. It would be unethical if the ideas of neurodiversity went so far as to take away the inalienable rights of others to better lives, as may be bestowed by appropriate intervention services.

Conclusions
Overall, it appears that college students and general population adults are accepting of individuals with ASCs when they are similar to them and when they understand them. Negative societal labeling may be negated and social treatment of individuals on the spectrum may be improved when an autistic person’s condition is known by the individuals interacting with them. In cases where the condition is disclosed and the typically developed person with whom the interaction is taking place has interaction experience, people on the autism spectrum should be met with more positive social responses and attitudes. Although these results suggest those with ASC may indeed feel comfortable telling others of their condition, they may still need to exercise caution. Only people who have other regular interaction experience with ASCs respond positively to such information. Guessing the extent of experience that others have with autistic individuals will likely be a difficult task.

Although some people may be made uncomfortable by them, diagnostic labels can clarify uncertainty for those who exhibit features characteristic of autism and the people who interact with them, and also allow for care services as needed. People whose cognitive tendencies lean toward those which could be considered qualitatively autistic, and people who have regular interactions with those with the condition, are more positive toward autistic behavior in their cognitive and behavioral responses, especially if they know that the person they are interacting with is on the autism spectrum. This information may serve as a useful social heuristic (that is, a set of simple rules which may inform decision-making; Hertwig, Hoffrage, & ABC Research Group, 2012) to those with ASCs, in deciding whether or not to disclose their condition.

Limitations
There were a number of limitations to this study, which did not assess participants’ empathy traits, and had a relatively small sample that did not allow for full hypothesis testing without risking type I errors. Effect sizes were small, but nonetheless detected by the study’s statistical power. Although this is a potential limitation for replication, our confidence that these results are reliable and representative of real effects is high, considering that these results generally reproduce findings from past research. Further, although participants were randomly assigned to either the diagnosis awareness or no-awareness condition, the study utilized an online self-report survey. It is therefore subject to all the limitations of self-report (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) and online survey methodology (Aust, Diedenhofen, Ullrich & Musch, 2013).
Future Directions

Future directions for this work include a follow-up replication study, which would take participants’ capacities for empathy into account, perhaps allowing us to investigate affective responses more aptly. Other work may more closely examine aspects of prosocial behavior (e.g., the roles of altruism or religiosity) stereotypes, and implicit prejudice in autistic peer perceptions and relations.

References


Diagnosis Disclosure and Responses to Autism | Bolton and Ault

**Questionnaire (SATQ):** Development of a brief self-report measure of subthreshold autism traits. 42, 769–780. https://doi.org/10.1002/sct.14188


E-mail: Matthew.Bolton@email.saintleo.edu

Author Note. Matthew J. Bolton, School of Arts and Sciences, Saint Leo University; Lara K. Ault, School of Arts and Sciences, Saint Leo University.

This article was written in fulfillment of the requirements for the lead author’s undergraduate senior thesis. He thanks his family, and mentors Mike Mogil and Greg Blumberg, for unwavering support through the course of this challenging project. In addition, he is particularly grateful to Ashton Harris, Alyssa Bates, and Christel Cruze for inspiration and thoughtful, spirited, and empathic discussion on autism, the nature of neurodiversity, and a multitude of disability-related topics. On an academic note, he is grateful to Steven Meigs for inspiring an interest in the academic study of morality; to Jenette Flow and Jodi Savell, whose early academic mentorship informed worldviews; to Simon Baron-Cohen, for correspondence regarding one of the psychological tests used in the study and inspiring an interest in the study of both empathy and autism; and finally, to his advisor, for patient and enthusiastic support of this and other research. The authors, collectively, are grateful to three anonymous reviewers whose comments greatly strengthened the final article. Author contributions: MJB proposed and designed the study, with minimal guidance from LKA. MJB was the primary author of the manuscript; LKA provided proofreading support. Both authors approved the final draft.

This manuscript qualifies for an Open Materials badge and an Open Data badge; the materials and data are available at https://osf.io/wmg6t.

Correspondence concerning this article should be addressed to Matthew J. Bolton, School of Arts and Sciences, Saint Leo University, Saint Leo, FL 33574.
Parental Attachment Predicting Emotions and Stress During Positive Life Events
Abigail A. Camden and Jennifer L. Hughes
Agnes Scott College

ABSTRACT. Relationships with parents such as those addressed in attachment theory can dictate emotion processing and perception of situations. Namely, insecure parental attachment (i.e., higher attachment-based anxiety and avoidance scores; Fraley, Heffernan, Vicary, & Brumbaugh, 2011b) can compromise emotion regulation and affect. However, although previous attachment research has addressed emotions during daily positive events (Gentzler, Kerns, & Keener, 2010), to our knowledge no studies have evaluated participants’ attachment in relation to their emotions during major positive life events that involve their parents (e.g., a wedding or holiday). Thus, the present study aimed to evaluate this and extend previous research (Gentzler & Kerns, 2006; Gentzler et al., 2010; Sheinbaum et al., 2015). This is important because major positive life events might solidify internal working models of attachment. Additionally, secure attachment and savoring positive emotions correlate with well-being. Participants (N = 310; M_age = 31.26) completed measures of attachment (i.e., attachment-based anxiety and avoidance) and emotions (e.g., joy, stress) in positive life events involving parents. Results of multiple hierarchical regression showed that insecure attachment predicted decreased joy (p < .001) and increased stress (p < .001) for positive events, after controlling for gender and age. Similarly, for imagined future events, insecure attachment predicted less positive emotions (p < .001) and more negative emotions (p < .001). These results imply that parental attachment can negatively impact positive emotions such as joy during positive life events. Implications and applications are discussed.

Relationships with parents can dictate how emotions are processed (Gentzler, Ramsey, Yuen Yi, Palmer, & Morey, 2013) and situations are perceived (Sheinbaum et al., 2015). Namely, family unpredictability, defined as inconsistent familial behaviors, can lead to the anxious belief that the world is an uncertain place (Burnett, Jones, Bliwise, & Ross, 2006; Ross, Hood, & Short, 2016). This anxiety can be explained by attachment theory (Ainsworth, Blehar, Walters, & Wall, 1978), which posits that people create an “internal working model” of attachment based on prior experiences with parents and other attachment figures (Bowlby, 1980; Bretherton, 1985). Although many parental relationships result in secure attachment, which is associated
with positive psychological outcomes (Schiffrin, 2014), others manifest in insecure attachment, which can be broadly described in two overarching dimensions—anxiety and avoidance (Fraley, Heffernan, Vicary, & Brumbaugh, 2011b; Fraley, Hudson, Heffernan, & Segal, 2015).

**Overview and Importance of the Present Research Topic**

Insecure attachment, or attachment-based anxiety and avoidance, negatively impacts emotional regulation and affective states (Malik, Wells, & Wittkowski, 2015; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010; Schiffrin, 2014; Simpson, Collins, Tran, & Haydon, 2007). However, despite this association between attachment theory and emotion regulation, and previous studies on its application in daily life (Gentzler & Kerns, 2006; Gentzler, Kerns, & Keener, 2010; Sheinbaum et al., 2015), prior work has not addressed the association between attachment orientations and the emotions experienced during major, positive life events (e.g., graduation, marriage). Therefore, in the present study, we explored attachment-based avoidance and anxiety in relationship to the experience of joy and stress in positive major life events that involve participants’ parents, in addition to emotions about imagined future life events with parents. This is an important arena of study because secure attachment (Mikulincer & Shaver, 2013), as well as the savoring of positive emotions (i.e., intensifying and sustaining positive affect), are associated with well-being and life satisfaction (Quoidbach et al., 2010). Moreover, major life events may have the capacity to solidify internal working models of attachment (i.e., schemas of relationships and the self; Hazan & Shaver, 1987), which include the affect associated with the events formulating the schema (Breherton, 1985). Although these models are established in childhood and adolescence and often remain consistent throughout the lifetime, they have the possibility of changing or becoming more elaborate (Bowlby, 1969; Pietromonaco & Barrett, 2000). For example, major life events often serve as significant memories, and offer an opportunity for parents to respond in a way that is commensurate with, or distinct from, the adult child’s working model—thereby reinforcing or altering the working model and its associated affect. Thus, the goal of the present study was to analyze parental attachment in relationship to the affect and emotions experienced during positive life events that involve one’s parents.

**Attachment Theory and Parental Attachment**

**Brief overview of attachment theory history.** In her seminal work, Ainsworth et al. (1978) built on Bowlby’s attachment theory (1969, 1980) and presented the Strange Situation research paradigm, in which infants were classified in terms of three attachment styles (i.e., secure, ambivalent, avoidant; Ainsworth et al., 1978). Secure individuals use the attachment figure as a “secure base” from which to seek interaction and derive comfort, and then to explore the world from (Ainsworth et al., 1978). Both ambivalent and avoidant attachment are categories of insecure attachment. In the Strange Situation, a confederate stranger enters a playroom that contains a mother-infant dyad. After some time, the mother leaves the child alone in the room with the stranger. Once the mother returns, the way in which the infant responds to her dictates its attachment style (Ainsworth et al., 1978). In the years following this research, Ainsworth’s advisee Main noted a fourth attachment style, disorganized-disoriented, another insecure category (Main & Solomon, 1986).

**Current conceptualization of attachment.** Many recent researchers have transitioned from categorical attachment categories (Main & Solomon, 1986) to continuous dimensions of attachment—anxiety and avoidance—based on taxometric analysis (Fraley et al., 2011b; Fraley et al., 2015; Mikulincer & Shaver, 2013). Attachment-based anxiety is “the extent to which people tend to worry about attachment-based concerns, such as the availability and responsiveness of an attachment figure,” and attachment-based avoidance is “the extent to which people are uncomfortable opening up to others and depending on them” (Fraley et al., 2011b, p. 617). Those who score higher on these two factors are said to be insecurely attached, and those who score low on attachment-based anxiety or avoidance can be said to be securely attached (Fraley et al., 2011b). In the present study, we used Fraley, Heffernan, Vicary, and Brumbaugh’s (2011a) conceptualization of attachment.

**Emotions and Attachment**

**Negative emotions, stress, and depression.** Attachment with parents can influence one’s experience of emotion throughout life. For example, Sheinbaum et al. (2015) found that insecure attachment was associated with lower levels of positive affect and higher levels of negative affect.
One emotional experience related to negative affect is stress. There is a positive relationship between cortisol, a hormone associated with stress response, and poor parenting variables (e.g., insecure attachment, lack of parental warmth, parental conflict; Jaremka et al., 2013; Lucas-Thompson, 2014; Smyth et al., 2015). That is, participants with insecure attachment or higher parental conflict, or with lower levels of maternal warmth, show greater increases in cortisol throughout the day (Jaremka et al., 2013; Lucas-Thompson, 2014) and during a social stress test (Smyth et al., 2015) than their counterparts with secure parental attachment. Moreover, these increased cortisol levels also impact the level of T cells, which are associated with strong cellular immune function, in such a way that those with insecure attachment display lower levels of T cells than those who are securely attached (Jaremka et al., 2013). Therefore, relationships with parents can influence emotional states as well as the associated biological functions. It is possible, then, that individuals with insecure attachment may experience heightened stress in positive life events (see Hypothesis C, below).

A second negative emotional state related to attachment is depression, which positively correlates with insecure attachment, and particularly anxious attachment (Brenning, Soenens, Braet, & Bosmans, 2012; Malik et al., 2015; Reynolds, Searight, & Ratwik, 2014; Schriffin, 2014). In a review, Malik et al. (2015) found, for adults, that the relationship between insecure attachment and depressive symptomatology was mediated by emotion regulation. Depression can involve symptoms of rumination (i.e., repetitively, negatively thinking about prior or future actions; Lanciano, Curci, Kafetsios, Elia, & Zammuner, 2012) and anhedonia (i.e., a reduced ability to derive joy; Troisi, Alcini, Goviello, Nanni, & Siracusano, 2010). Insecure attachment is positively associated with rumination (Burnette, Davis, Green, Worthington, & Bradfield, 2009; Lanciano et al., 2012) and rumination in romantic relationships (Reynolds et al., 2014). Likewise, anhedonia (specifically social anhedonia) is positively associated with insecure attachment, and is most strongly predicted by avoidant attachment (Troisi et al., 2010). Both anhedonia and rumination are important components when evaluating the relationship between attachment and the experience of emotions during positive life events, because anhedonia and rumination could be related to difficulty experiencing joy in positive life events, or negative reflection about these life events (see Hypotheses A, E, and F, below).

**Positive emotions.** Attachment theory also serves as a framework to understand the processing and regulation of positive emotions. In recent years, researchers have evaluated the relationship between attachment theory and positive psychology. To this end, Schriffin (2014) evaluated positive affect as a mediator in the relationship between attachment orientation and developmental outcomes (e.g., perceived physical health, social support). Schriffin (2014) found that developmental outcomes are not fully predicted by attachment orientation, but are rather partially mediated by affect, regardless of whether that affect derives from secure attachment or from nonparental means. Thus, notwithstanding the impact of parental relationships on life outcomes, increasing one’s positive affect could promote positive life outcomes (e.g., optimism, ego-resiliency; Schriffin, 2014). Likewise, insecure attachment can improve through positive relationships, such as that with a psychotherapist (Shaver & Mikulincer, 2008).

In addition to relating attachment to positive psychology, researchers have also connected it to the maintenance or suppression of positive emotions. Namely, secure attachment has been associated with savoring, intensifying and sustaining positive affect (Gentzler et al., 2013; Quoidbach et al., 2010). Conversely, regulation of positive emotions also includes dampening, undermining and reducing positive affect (Quoidbach et al., 2010). Savoring includes showing positive emotions through facial expressions, being mindful of the positive event, sharing the joy with others, and “positive mental time travel” (i.e., reminiscing or “anticipating positive events”; Quoidbach et al., 2010, p. 2). Dampening includes concealing joy, “distraction,” “fault finding,” and “negative mental time travel” (e.g., ruminating about the cause or the end of the positive emotions; Quoidbach et al., 2010, p. 2). Savoring is associated with subjective well-being, such as life satisfaction (Quoidbach et al., 2010; Ramsey & Gentzler, 2014), and is negatively correlated with depression (Ramsey & Gentzler, 2014).

In a study of adolescents, Gentzler et al. (2013) found that securely attached individuals reported marginally more savoring than those who were insecurely attached, and Ramsey and Gentzler (2014) found that women acknowledged more savoring than men. Further, insecure attachment has been associated with diminished savoring (Shaver & Mikulincer, 2014), and the dampening...
or repression of positive emotions, particularly for those with avoidant attachment (Goodall, 2015; Mikulincer & Orbach, 1995). Thus, because of the relationship between avoidant attachment and dampening, the experience of joy in positive life events—the focus of the present study—may be more negatively associated with avoidant attachment rather than anxious attachment (see Hypothesis B, below).

**Positive Major Life Events, Attachment, and Emotions**

*Attachment and emotions.* Attachment dimensions and their correlated emotion-regulation strategies can provide an avenue for analyzing emotions and stress during positive major life events, in which emotions can be heightened and parents are often present. In a review article, Mikulincer and Shaver (2013) noted that multiple studies have shown that insecure attachment is associated with downplaying positive emotions (Mikulincer & Orbach, 1995) such as those in positive life events. This experience appears to be physical, too, with the facial muscles of insecurely attached individuals shown to display less joy and more negativity (Magai, Hunziker, Mesias, & Culver, 2000; Sonnby-Borgström & Jönsson, 2003). Similarly, insecure attachment is associated with reacting more intensely to negative events (Shaver & Mikulincer, 2014) and experiencing more daily negative affect, particularly with romantic partners (Simpson et al., 2007). Specifically, attachment-based avoidance is associated with emotional inhibition, and attachment-based anxiety is related to distress intensification (Shaver & Mikulincer, 2014). Because of this inhibition and intensification, anxious attachment may be more strongly correlated than avoidant attachment with the experience of stress in positive life events (see Hypothesis C, below), and avoidant attachment may be more negatively correlated than anxious attachment with joy in positive life events (see Hypothesis B, below).

**Positive events and future events.** One focus of the present study is emotions and stress in major positive life events. For daily positive events, insecurely attached individuals tend to minimize their previously experienced positive affect (Gentzler & Kerns, 2006; Gentzler et al., 2010), and tend to enjoy their daily activities less (Sheinbaum et al., 2013). Similarly, childhood trauma—aakin to insecure parental attachment, but not equivalent—has been associated with intensified negative affect and greater decreases in positive affect during daily events (Infurna, Rivers, Reich, & Zautra, 2015). Another focus of the present study is emotions about future life events with parents. Related to future life events, attachment-based anxiety has been shown to predict negative mental time travel (i.e., negative anticipations; Goodall, 2015), and is associated with rumination, which can include negative anticipation (Burnette et al., 2009; Lanciano et al., 2012). Therefore, insecurely attached individuals might predict less positive emotions for future life events (see Hypotheses E and F, below). These connections between attachment and negative and positive affect suggest that positive life events, as well as future life events, would be experienced and anticipated differently by those who are insecurely attached (see Hypotheses A, C, E, and F, below).

**Positive Life Events With Parents**

Positive affect can be heightened and savored or diminished and dampened (Quoidbach et al., 2010). Likewise, the emotions from positive life events such as holidays, graduations, and weddings, can be experienced as positive or negative. Positive life events often involve families and parents. It may be the case that parents are one factor impacting positive emotions or negative emotions within these events. That is, adult children who are securely attached with their parents may experience positive emotions such as love, gratitude, and comfort (Mikulincer & Shaver, 2013) when they take part in these events with their attachment figures. Conversely, parents could add unpredictability, anxiety (Ross et al., 2016), negative emotions, or stress for those who are insecurely attached with their parents. However, this is an area of research that is not greatly examined.

**Present Study**

Although previous attachment research has addressed the experience of emotion during daily positive events, to our knowledge, no studies have evaluated attachment in relationship to the experience of emotion during major positive life events with parents (e.g., graduations, weddings), which can serve as significant memories. Because of the importance given to major life events and parents’ involvement in them, these events have the potential to solidify the internal working models of attachment, as previously explained, and are therefore an important topic to study. Moreover, positive life events offer an opportunity for positive affect, which can be savored. Because
savoring of positive affect is related to well-being (Quoidbach et al., 2010; Ramsey & Gentzler, 2014), and because well-being is negatively associated with insecure attachment (Mikulincer & Shaver, 2013), it is important to further evaluate attachment and the experience of emotions in positive life events. This could provide a starting point for interventions addressing emotion regulation during these events. Thus, the goal of the present study was to address this literature gap by evaluating attachment-based avoidance and anxiety in relation to emotions and stress experienced during major positive life events that involved parents.

Specifically, we hypothesized that (a) higher scores on maternal and paternal attachment-based avoidance and anxiety (i.e., insecure attachment) would predict less joy during positive life events that involve parents. Additionally, (b) avoidance, as compared to anxiety, would have a stronger negative correlation with joy. Next, (c) higher avoidance and anxiety scores would predict more stress, and (d) anxiety, as compared to avoidance, would be more strongly correlated with stress. Finally, for imagined future positive life events, higher avoidance and anxiety scores would predict (e) less positive emotions and (f) more negative emotions.

**Method**

**Participants**

We recruited 371 participants. Inclusion criteria for participation included residence in the United States and English language ability (i.e., good–very strong on our survey). Forty-three participants were excluded for failing to meet these criteria, or because of significant missing data. The remaining participants (N=328) included 208 women and 102 men. Eleven individuals were genderqueer, transgender, or fluid, and the seven other participants did not report a gender identity. Because our data analyses were planned to control for gender, and there were not enough gender nonbinary participants to form a representative sample, only those identifying as a “woman” or “man” were included in the following analyses. This left 310 final participants who had an average age of 31.26 years (SD = 14.32, age range: 18–78 years). Additional demographic information is provided in Table 1.

**Measures**

Participants were administered demographic questions in addition to the following battery of measures.

**Parental attachment.** Attachment with mother and/or father was measured using the Experiences in Close Relationships—Relationship Structures Questionnaire (ECR-RS; Fraley et al., 2011a). The scale has nine statements and is designed to assess anxiety and avoidance for various interpersonal targets (i.e., parents, romantic partners, friends) by repeating the questionnaire for each target. The instructions tell participants which relationship target to think about while responding to the statements on a 7-point response scale from 1 (strongly disagree) to 7 (strongly agree). After reverse-keying items and averaging responses, the scale produces

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables of Sample</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>White/European American</td>
<td>194 (64.0%)</td>
</tr>
<tr>
<td>Asian</td>
<td>66 (21.8%)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>36 (11.9%)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>13 (4.3%)</td>
</tr>
<tr>
<td>No report</td>
<td>7 (2.3%)</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>5 (1.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>96 (31.0%)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>84 (27.1%)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>50 (16.1%)</td>
</tr>
<tr>
<td>High school diploma/GED</td>
<td>38 (12.3%)</td>
</tr>
<tr>
<td>Some post-undergraduate work</td>
<td>11 (3.5%)</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>10 (3.2%)</td>
</tr>
<tr>
<td>Doctorate (e.g., PhD)</td>
<td>8 (2.6%)</td>
</tr>
<tr>
<td>Professional degree (e.g., MD)</td>
<td>8 (2.6%)</td>
</tr>
<tr>
<td>Some high school</td>
<td>3 (1.0%)</td>
</tr>
<tr>
<td>Vocational training</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>182 (59.3%)</td>
</tr>
<tr>
<td>Midwest</td>
<td>40 (13.0%)</td>
</tr>
<tr>
<td>Northeast</td>
<td>52 (16.9%)</td>
</tr>
<tr>
<td>West</td>
<td>33 (10.7%)</td>
</tr>
</tbody>
</table>

Note. N = 310 (n_women = 208, n_men = 102), M_age = 31.26 (SD = 14.32, age range: 18–78). The frequencies of race/ethnicity do not add up to 310 because participants were directed to “select all that apply to you.”
two scores: one for attachment-based anxiety and one for attachment-based avoidance, with higher scores indicating greater anxiety or avoidance (i.e., more insecure attachment). Attachment-based anxiety is “the extent to which people tend to worry about attachment-based concerns, such as the availability and responsiveness of an attachment figure” (Fraley et al., 2011b, p. 617). An example item is “I often worry that this person doesn’t really care for me.” Attachment-based avoidance is “the extent to which people are uncomfortable opening up to others and depending on them” (Fraley et al., 2011b, p. 617). An example item is “I don’t feel comfortable opening up to this person.” Fraley et al. (2011b) found strong reliability for the ECR-RS, indicated by Cronbach’s αs ranging from .81 to .91 for the anxiety and avoidance scores for mother, father, partner, and friend (αglobal avoidance = .88; αglobal anxiety = .85). For our sample, we also found the ECR-RS scores to have strong reliability (αmaternal avoidance = .91, αmaternal anxiety = .89, αpaternal avoidance = .92, αpaternal anxiety = .90). In terms of discriminant validity, Fraley et al. (2011b) found both scores of the ECR-RS to positively correlate with depression, and negatively correlate with relationship satisfaction, commitment, and investment, when the interpersonal target was romantic (Fraley et al., 2011b).

**Joy in positive life events with parents.** We wrote eight items in order to measure the amount of joy participants experienced in positive life events from the past year (e.g., graduation, Thanksgiving) that involved their parents. The directions given to participants were “Which of the following events happened to you and involved interacting with one or more of your parents or step parents? How much joy did you experience?” Example items are “Your wedding during 2015–2016” and “You celebrated Thanksgiving 2015.” We used a response scale from 1 (no joy) to 5 (a lot of joy); with an “N/A” option for events irrelevant to the participant). Scores were calculated by averaging the responses for the events, and higher scores convey more joy experienced. Because participants differed widely in terms of what events they had experienced in the previous year, and therefore the measure was unique to each participant, Cronbach’s α coefficients were not meaningful estimates of reliability.

**Stress in positive life events with parents.** To evaluate the stress felt during positive life events with parents, we wrote eight items. We used a response scale from 1 (no stress) to 5 (a lot of stress), and the directions were identical to the previous measure except for a change in the last question: “How much stress did you experience [in each life event] because of one or more of your parents?” Items were identical to the previous measure, and higher scores convey more stress experienced. As stated above, because of variation in the events experienced by the participants, the participants’ races/ethnicities showed that being recruited from MTurk was not significantly related to being American Indian/Alaska Native, Black/African American, Hispanic/Latino, or an “other”
race/ethnicity. However, men recruited from MTurk were significantly more likely to be Asian or White. Chi-squares of independence were not calculated for Middle Eastern/North African or Hawaiian/Pacific Islander because there were not enough cases to analyze.

All participants completed the survey through Survey Monkey, and MTurk workers were paid $0.50. Although research participation was voluntary, participants were offered the opportunity to enter a drawing for one of two $50 Amazon gift cards by providing their e-mail (not connected to their survey data).

Data Analysis
Prior to evaluating our hypotheses with multiple hierarchical regression, we analyzed the data for meeting the requisite assumptions of nonmulticollinearity by checking the intercorrelations (see Table 2), tolerance, variance inflation factor, and condition index. The condition index of all four models was 11.26, indicating a small degree of multicollinearity (see Limitations section). All other criteria of multicollinearity indicated that the data was acceptable for further testing. In our hierarchical regression, we controlled for age and gender. We chose to control for gender, but not ethnicity, because Fraley et al. (2011a) reported a difference in ECR-RS scores for sex (albeit different than gender), but not for ethnicity. Additionally, we controlled for age because of the large age range of our participants.

Results
Descriptive statistics and bivariate correlations for all main study variables are provided in Table 2. Results were analyzed for 310 participants, though pairwise deletion by the Statistical Package for the Social Sciences (SPSS) led to differing ns for each analysis (e.g., older participants missing data because of deceased parents).

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mat. Avoid.</td>
<td>307</td>
<td>3.21</td>
<td>1.65</td>
<td>1–7</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mat. Anx.</td>
<td>307</td>
<td>1.91</td>
<td>1.42</td>
<td>1–7</td>
<td>.41**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pat. Avoid.</td>
<td>297</td>
<td>3.72</td>
<td>1.76</td>
<td>1–7</td>
<td>.36**</td>
<td>.16</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pat. Anx.</td>
<td>297</td>
<td>2.19</td>
<td>1.66</td>
<td>1–7</td>
<td>.20**</td>
<td>.57**</td>
<td>.52**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Joy</td>
<td>251</td>
<td>3.78</td>
<td>1.04</td>
<td>1–5</td>
<td>-.40**</td>
<td>-.28**</td>
<td>-.40**</td>
<td>-.31**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Stress</td>
<td>244</td>
<td>2.56</td>
<td>1.15</td>
<td>1–5</td>
<td>.30**</td>
<td>.25**</td>
<td>.24**</td>
<td>.27**</td>
<td>-.44**</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pos. Emotion</td>
<td>283</td>
<td>3.71</td>
<td>1.02</td>
<td>1–5</td>
<td>-.64**</td>
<td>-.36**</td>
<td>-.44**</td>
<td>-.31**</td>
<td>.64**</td>
<td>-.42**</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Neg. Emotion</td>
<td>283</td>
<td>2.67</td>
<td>1.05</td>
<td>1–5</td>
<td>.43**</td>
<td>.32**</td>
<td>.34**</td>
<td>.34**</td>
<td>-.52**</td>
<td>.52**</td>
<td>-.63**</td>
<td>–</td>
</tr>
</tbody>
</table>

Note. Range = range of possible scores; Mat. Avoid. = maternal attachment-based avoidance; Mat. Anx. = maternal attachment-based anxiety; Pat. Avoid. = paternal attachment-based avoidance; Pat. Anx. = paternal attachment-based anxiety; Pos. Emotion = positive emotion about future life events; and Neg. Emotion = negative emotion about future life events.

* p < .05. ** p < .001.

<table>
<thead>
<tr>
<th>Variable</th>
<th>b</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.002</td>
<td>.002</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.04</td>
<td>0.15</td>
<td>-0.02</td>
<td>-0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.003</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td>.26</td>
<td>.26</td>
<td></td>
</tr>
<tr>
<td>Maternal Avoidance</td>
<td>-0.16</td>
<td>0.05</td>
<td>-0.25</td>
<td>-3.62**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Anxiety</td>
<td>-0.10</td>
<td>0.06</td>
<td>-0.12</td>
<td>-1.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Avoidance</td>
<td>-0.15</td>
<td>0.05</td>
<td>-0.25</td>
<td>-3.18*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Anxiety</td>
<td>-0.06</td>
<td>0.06</td>
<td>-0.09</td>
<td>-0.99</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. * p < .05. ** p < .001.
Retrospective Emotions for Positive Events

Predicting joy in previous events. To examine whether attachment-based anxiety and avoidance would predict less joy experienced in positive life events with parents (Hypothesis A), we conducted a multiple hierarchical regression with covariates of age and gender and predictors of maternal and paternal attachment-based avoidance and anxiety. This hypothesis was partially supported (see Table 3), because after controlling for gender and age, attachment-based avoidance but not attachment-based anxiety was negatively related to joy, $\beta_{\text{maternal avoidance}} = -.25, p < .001$; $\beta_{\text{paternal avoidance}} = -.25, p = .002$; $\beta_{\text{maternal anxiety}} = .12, p = .13$; and $\beta_{\text{paternal anxiety}} = -.09, p = .03$. The model as a whole was significant, $F(6, 220) = 13.04, p < .001$, and accounted for 26.2% of the variance in joy. Additionally, we did not observe gender differences in reported joy between women ($M = 3.80, SD = 1.05$) and men ($M = 3.80, SD = 1.04$), $t(233) = .02, p = .98, d = .003$. Thus, Hypothesis A was partially supported, with maternal and paternal attachment-based anxiety predicting the joy experienced in positive events, such that, as anxiety scores increase, joy decreases.

Comparing avoidance and anxiety in association with joy. We conducted a series of correlations and Fisher’s $r$ to $z$ transformations to evaluate whether attachment-based avoidance would be more negatively correlated with joy than attachment-based anxiety would be (Hypothesis B). A Pearson correlation coefficient was calculated for the relationship between maternal and paternal avoidance and anxiety and average joy experienced in positive events with parents (see Table 2). A negative correlation was found between maternal attachment-based avoidance and joy, $r = -.40, p < .001$; maternal attachment-based anxiety and joy, $r = -.28, p < .001$; paternal attachment-based avoidance and joy, $r = -.40, p < .001$; and paternal attachment-based anxiety and joy, $r = -.31, p < .001$. To compare these correlation coefficients, we conducted two Fisher $r$ to $z$ transformations, first comparing maternal anxiety and avoidance, then paternal anxiety and avoidance. No significant difference was found for maternal attachment, $z = -1.50, p = .13$, nor for paternal attachment, $z = -1.12, p = .26$. Therefore, Hypothesis B was not supported.

Predicting stress in previous events. We conducted a multiple hierarchical regression to evaluate the hypothesis that increased stress during positive life events with parents would be predicted by attachment-based anxiety and avoidance, after controlling for age and gender (Hypothesis C). This hypothesis was partially supported (see Table 4), with stress predicted by maternal avoidance ($\beta = .22, p = .003$) and paternal anxiety ($\beta = .72, p = .04$), but not maternal anxiety ($\beta = .03, p = .76$) or paternal avoidance ($\beta = .03, p = .74$), after controlling for gender and age. In the final model, age was also a significant predictor of stress, $\beta = .13, p = .04$. The model as a whole was significant, $F(6, 216) = 6.00, p < .001$, and explained 14.3% of the variance in stress. Moreover, men ($M = 2.45, SD = 1.14$) and women ($M = 2.57, SD = 1.14$) did not differ significantly in reported stress levels, $t(228) = -.76, p = .45, d = .11$. On the basis of the regression model, Hypothesis C was partially supported, and it appears that, as maternal attachment-based avoidance and paternal attachment-based anxiety scores increase, the stress experienced in positive

TABLE 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>$b$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>$R^2_{\text{adj}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.21</td>
<td>0.17</td>
<td>0.06</td>
<td>1.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.01</td>
<td>0.01</td>
<td>0.12</td>
<td>1.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Avoidance</td>
<td>0.16</td>
<td>0.05</td>
<td>0.22</td>
<td>2.96*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Anxiety</td>
<td>0.02</td>
<td>0.07</td>
<td>0.03</td>
<td>0.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Avoidance</td>
<td>0.02</td>
<td>0.06</td>
<td>0.03</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Anxiety</td>
<td>0.14</td>
<td>0.07</td>
<td>0.72</td>
<td>2.06*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $^*p < .05$.

TABLE 5

<table>
<thead>
<tr>
<th>Variable</th>
<th>$b$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$R^2$</th>
<th>$R^2_{\text{adj}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.03</td>
<td>0.14</td>
<td>0.01</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.01</td>
<td>0.004</td>
<td>-0.18</td>
<td>-2.82*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Avoidance</td>
<td>-0.32</td>
<td>0.03</td>
<td>-0.52</td>
<td>-9.72*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Anxiety</td>
<td>-0.08</td>
<td>0.05</td>
<td>-0.10</td>
<td>-1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Avoidance</td>
<td>-0.13</td>
<td>0.03</td>
<td>-0.22</td>
<td>-3.69*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paternal Anxiety</td>
<td>-0.03</td>
<td>0.04</td>
<td>-0.05</td>
<td>-0.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $^*p < .05$, $^*p < .01$. 
Comparing anxiety and avoidance in association with stress. To evaluate if attachment-based anxiety, as compared to attachment-based avoidance, would be more strongly correlated with stress (Hypothesis D), we conducted a series of correlations and Fisher’s r to z transformations to compare these correlations. Pearson correlation coefficients were calculated for the relationship between maternal and paternal anxiety and avoidance, and the stress experienced in positive life events with parents (see Table 2). There was a positive correlation between maternal attachment-based avoidance and stress, \( r = .30, p < .001 \); maternal attachment-based anxiety and stress, \( r = .25, p < .001 \); paternal attachment-based avoidance and stress, \( r = .24, p < .001 \); and paternal attachment-based anxiety, \( r = .27, p < .001 \). Next, we performed two Fisher’s r to z transformations to compare these correlation coefficients for maternal anxiety and avoidance, and then paternal anxiety and avoidance. No significant difference was found for maternal attachment-based anxiety and avoidance, \( z = 0.59, p = .56 \), nor paternal attachment-based anxiety and avoidance, \( z = -0.34, p = .73 \). Therefore, Hypothesis D was not supported; stress was not more strongly correlated to anxiety than avoidance.

**Emotions for Future Events**

**Predicting positive emotions for future events.** To examine the hypothesis that attachment-based anxiety and avoidance would predict less positive emotions about future life events (Hypothesis E), we conducted a multiple hierarchical regression. This hypothesis was partially supported (see Table 5) because, after controlling for age and gender, maternal avoidance (\( \beta = -.52, p < .001 \)) and paternal avoidance (\( \beta = -.21, p < .001 \)) were negatively related to positive emotions for anticipated life events, and maternal anxiety (\( \beta = -.10, p = .10 \)) and paternal anxiety (\( \beta = -.05, p = .47 \)) were not. Additionally, in the final model, age remained a predictor of less positive emotions, \( \beta = -.20, p < .001 \). The model as a whole was significant, \( F(6, 249) = 43.03, p < .001 \), and accounted for 50.9% of the variance in positive emotions. Moreover, there were no gender differences in women’s (\( M = 3.78, SD = 0.97 \)) and men’s (\( M = 3.65, SD = 1.10 \)) positive emotions about imagined future life events, \( t(265) = .98, p = .33, d = .12 \). Overall, on the basis of the multiple hierarchical regression, it appears that, as maternal and paternal attachment-based avoidance increase, positive emotions for future events decrease, thereby partially supporting Hypothesis E.

**Predicting negative emotions for future events.** To evaluate Hypothesis F that attachment-based anxiety and avoidance would predict more negative emotions about future life events, we conducted a multiple hierarchical regression with the maternal and paternal anxiety and avoidance as predictors of negative emotions. This hypothesis was partially supported (see Table 6), because after controlling for age and gender, maternal avoidance (\( \beta = .34, p < .001 \)) was positively related to negative emotions, and maternal anxiety (\( \beta = .05, p = .51 \)), paternal avoidance (\( \beta = .14, p = .06 \)), and paternal anxiety (\( \beta = .15, p = .07 \)) were not. The model as a whole was significant, \( F(6, 249) = 14.10, p < .001 \), and explained 25.4% of the variance in negative emotions. Additionally, we did not find a significant gender difference between the negative emotions of women (\( M = 2.64, SD = 1.05 \)) and men (\( M = 2.58, SD = 1.04 \)), \( t(265) = .49, p = .63, d = .06 \). Therefore, this multiple hierarchical regression shows that, as maternal attachment-based anxiety scores increase, the negative emotions that participants feel about future positive events with the parent also increase, partially supporting Hypothesis F.

**Discussion**

The present study addressed the connections between insecure parental attachment and the emotions and stress experienced in adult major positive life events that involve interactions with parents (i.e., attachment figures). Our results showed that, for each criterion variable, some combination of attachment-based avoidance and anxiety predicted decreased joy and increased stress for positive life events with parents. Specifically, joy was predicted

<table>
<thead>
<tr>
<th>Variable</th>
<th>( b )</th>
<th>SE</th>
<th>( t )</th>
<th>( R^2 )</th>
<th>( \Delta R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.06</td>
<td>0.14</td>
<td>0.03</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.001</td>
<td>0.01</td>
<td>-0.02</td>
<td>-0.30</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Avoidance</td>
<td>0.22</td>
<td>0.04</td>
<td>0.34</td>
<td>5.13**</td>
<td></td>
</tr>
<tr>
<td>Maternal Anxiety</td>
<td>0.04</td>
<td>0.06</td>
<td>0.05</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>Paternal Avoidance</td>
<td>0.08</td>
<td>0.04</td>
<td>0.14</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>Paternal Anxiety</td>
<td>0.10</td>
<td>0.05</td>
<td>0.15</td>
<td>1.82</td>
<td></td>
</tr>
</tbody>
</table>

Note. **p < .001.**
by maternal and paternal avoidance, and stress was predicted by maternal avoidance and paternal anxiety. Additionally, contrary to our hypothesis, the correlation between joy and attachment-based avoidance was not significantly stronger than that between joy and attachment-based anxiety. Likewise, we did not find support for our hypothesis that attachment-based anxiety, as compared to avoidance, would be more strongly correlated with stress. For imagined future positive events, we found that maternal and paternal avoidance predicted less positive emotions, and only maternal avoidance predicted more negative emotions. Overall, it appears that attachment-based avoidance was more predictive of emotions in positive life events than was anxiety.

Joy and Stress in Retrospective Positive Events
The present findings connect to previous literature in attachment theory and emotion regulation, both by supporting and contradicting prior findings. Specifically, our finding that decreased joy is predicted by attachment-based avoidance supports the literature on insecure attachment and anhedonia (i.e., trouble experiencing joy; Troisi et al., 2010) and its antecedent of depression (Burnette et al., 2009), because in these studies, insecure attachment and positive affect were inversely related. Similarly, our findings are related to those of Gentzler et al. (2013), who observed that the savoring of positive emotions (i.e., the process of maintaining and heightening positive affect) was marginally lower in insecure participants as compared to secure participants. Our finding that increased avoidance was related to reduced joy also supports previous work on insecure attachment and the minimization of prior positive affect (Gentzler & Kerns, 2006; Gentzler et al., 2010), and Sheinbaum et al.’s (2015) finding that those who are insecurely attached tend to derive less pleasure from their daily activities. Moreover, our finding that attachment-based avoidance and anxiety predicted increased stress is related to the literature on insecure attachment and increased stress and cortisol (Jaremka et al., 2013; Lucas-Thompson, 2014; Smyth et al., 2015). However, contrary to Gentzler et al. (2013), who found that female participants showed more dampening responses (i.e., reducing positive affect) than male participants, we did not observe gender differences in the amount of joy nor stress reported.

Comparing Avoidance and Anxiety
Our finding that attachment-based anxiety and avoidance were not differentially associated with the experiences of joy or stress contradicts those of Troisi et al. (2010). Troisi et al. found that anhedonia (i.e., difficulty deriving joy) was most strongly predicted by avoidant attachment, but our results showed that avoidance, as compared to anxiety, was not significantly more strongly correlated with joy. Further, these results also differ from the literature on the dampening of positive emotions, which shows that dampening is more common for those with higher avoidant attachment (Goodall, 2015; Mikulincer & Orbach, 1995). Our contrasting findings imply that the relationship between attachment-based avoidance and positive emotions is complex, and may differ in positive life events, as compared to the contexts explored in previous literature (Goodall, 2015; Mikulincer & Orbach, 1995; Troisi et al., 2010). Future research should work to disentwine the differences. We also found that, contrary to our hypothesis, the positive correlation between stress and attachment-based anxiety was not significantly stronger than that between stress and attachment-based avoidance. This finding is in opposition to Smyth et al. (2015), who evaluated attachment and stress, and found that attachment-based anxiety (i.e., rather than avoidance) was associated with the greatest increases in cortisol, a stress hormone, during a social stress test. Of course, it may be that our results differ from Smyth et al. (2015) because our study was not a social stress test, and we measured stress by self-report as opposed to cortisol levels. However, it could also be that our contrasting results imply that the expression of attachment-based avoidance and anxiety may differ based on context (e.g., in purely stressful situations, as opposed to positive life events that could be both stressful and joyful). Perhaps more importantly, our contrasting findings imply that the relationship between attachment and emotion is complex, and future work is thereby warranted.

Positive and Negative Emotions for Future Events
We observed that maternal attachment-based avoidance predicted more negative emotions, and maternal and paternal avoidance predicted less positive emotions about future events. This supports previous connections between insecure attachment and rumination (Lanciano et al., 2012; Reynolds et al., 2014), because our findings suggest that those with higher attachment-based avoidance scores are thinking negatively about the future. Further, this also relates to the negative mental time travel (i.e.,
negative anticipations) that Quoidbach et al. (2010) posited as part of dampening of positive life events. Additionally, other researchers have found an association between dampening and insecure attachment, particularly avoidant attachment (Goodall, 2015; Mikulincer & Orbach, 1995). Because dampening is the suppression of positive affect, our findings that avoidance predicts less positive emotions and more negative emotions about the future support these. However, contrary to Reynolds et al. (2014), who found rumination to be higher in women, we did not find that women reported more negative emotions or less positive emotions for positive life events. Our findings may differ from theirs because we did not explore attachment in the context of romantic relationships, which was the focus of their study. Overall, it appears that the findings of the present research support prior literature on attachment and emotion.

Implications of the Present Study
The current study and its results hold both theoretical and practical implications. Specifically, in terms of attachment theory, it appears that not only is insecure attachment inversely related to the positive affect experienced in daily positive events (Sheinbaum et al., 2015), but also to the positive affect felt in major positive life events such as weddings, holidays, or graduations. Thus, the impact of insecure attachment may be more pervasive than we previously thought, because its correlates of anhedonia (Troisi et al., 2010) and increased stress (Smyth et al., 2015) appear to hold true even in major positive life events. Therefore, the present study supports and extends attachment theory.

In terms of practical implications, the present findings suggest that the negative affective states inherent in insecure parental attachment do not cease after childhood. Instead, they play into adult life and can affect one’s experiences of life events that should be positive. In particular, this study suggests that some combination of attachment-based avoidance and anxiety is associated with less positive affect and more negative affect or stress, both in retrospective recollections and anticipations of future major positive life events that involve parents. It is possible then that interventions such as those offered by psychotherapy could help, because previous research has shown that insecure attachment can be improved with psychotherapy (Shaver & Mikulincer, 2008). Additionally, another intervention could be conscious use of savoring strategies, which have been shown to increase and maintain positive affect (Quoidbach et al., 2010). Improvement in the experience or savoring of joy for insecurely attached individuals is important because major positive life events such as weddings often serve as significant memories, and savoring positive affect is positively correlated with life satisfaction (Quoidbach et al., 2010).

Thoughts of, and interactions with, attachment figures should bring positive feelings such as calm, comfort, and love (Mikulincer & Shaver, 2013). However, it appears that, for those who are insecurely attached, the opposite is true, because we found that insecure attachment predicts more stress. Thus, the current study implies that stress management techniques and interventions may be especially warranted for those who are insecurely attached. Moreover, this is particularly important because Jaremka et al. (2013) found that the higher levels of stress hormone cortisol found in insecure individuals were related to lower levels of T cells, important for cellular immune function.

Strengths and Weaknesses of the Present Study
To our knowledge, previous research has not explored this topic. Thus, one strength of this study is its contribution to the literature on how parental attachment orientations are exhibited in adult life, specifically in the domain of emotions during major positive life events that involve participants’ parents. Moreover, another strength of the current work is the use of a large sample of 310 participants, which bolsters our confidence in the results of the study. Finally, our study is strong because of the use of the Experiences in Close Relationship Questionnaire—Relationships Structures (Fraley et al., 2011a), supported by taxometric analysis (Fraley et al., 2015) and psychometric analysis (Fraley et al., 2011b).

Although the present study has multiple strengths, there are weaknesses too. One weakness is the small but significant multicollinearity present in the data, indicated by the condition index of 11.26 for all four models. This could suggest that the predictors are not independent of one another (albeit, understandably, as attachment-based anxiety and avoidance are two dimensions of insecure attachment). However, our other measures of multicollinearity indicated that the data was acceptable for further testing. Another weakness is our nonrandom snowball sampling technique. Because of this technique, some participants knew the researchers or each other, and therefore might have had similar characteristics to each other. This
could hinder the generalizability of the findings. Finally, the retrospective reporting of joy and stress complicates interpretation of the results and introduces potential confounds of memory deficit. Namely, we cannot be sure whether our findings are because of participants under-reporting their previous joy (e.g., as Gentzler & Kerns, 2006, and Gentzler et al., 2010, found with insecure participants) or if insecure participants were truly experiencing less joy than their counterparts (e.g., as Sheinbaum et al., 2015, found).

Directions of Future Research

The current study could be expanded upon in order to replicate and extend the findings. One interesting finding of the present study was that attachment-based avoidance seemed to be the strongest predictor, or the only predictor in one model, of participants’ emotions in positive life events. This warrants future study to explore why that may be. Another line of future research could evaluate the mediators and moderators within the relationship between insecure attachment (i.e., attachment-based anxiety and attachment-based avoidance) and negative affect (i.e., decreased joy, increased stress, more negative feelings about the future). One such mediator that could account for the relationship between insecure attachment and reduced joy and increased stress is emotional regulation, explored by Malik et al. (2015). Moderators could be the presence of secure attachment figures in positive events with parents, such as those with a romantic partner or best friend. The presence of these individuals could moderate and change the observed phenomenon that insecure attachment is associated with negative affect, because later-life secure attachment relationships have been shown to improve insecure attachment (Shaver & Mikulincer, 2008).

Another future study could measure the current study’s decreased joy for recalled events and negative emotions for future events through the lens of clinical psychology. Namely, researchers could employ measures of depression and anxiety such as the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), and the symptomology of anhedonia and rumination, to evaluate correlates and predictors of emotions experienced with parents for insecurely attached individuals. Depression and anxiety could be presented as mediators in a statistical model of the experience of positive life events.

Finally, instead of evaluating positive and negative affect in positive events retrospectively, the “experience sampling method” (Sheinbaum et al., 2015) could be employed to randomly measure affect throughout the experience of the event. However, because this technique could be compromised by the external circumstances of major events (e.g., weddings), same-day journal entry and affect measurement could be used instead to collect data that preserves initial reactions to major life events. These directions for future research could replicate and extend the present findings.

Conclusion

This study explored attachment-based avoidance and anxiety in relationship to the emotions experienced in positive life events involving participants’ parents. We found that, for all models, some combination of maternal and paternal avoidance and anxiety, or only avoidance in the case of one model, predicted less positive emotions and more negative emotions. These findings contribute to the literature by extending previous work on attachment and emotions in daily life events (Gentzler et al., 2010) to the domain of major positive life events.

References


Fraley, R. C., Hudson, N. W., Hefferman, M. E., & Segal, N. (2015). Are adult attachment styles categorical or dimensional? A taxometric analysis of


author note. Abigail A. Camden (ORCID iD: 0000-0001-8251-836X), Department of Psychology, Agnes Scott College; Jennifer L. Hughes, Department of Psychology, Agnes Scott College.

special thanks to Psi Chi Journal reviewers for their support.

this manuscript qualifies for an Open Materials badge and an Open Data badge; the materials and data are available at https://osf.io/ef78n/

Correspondence concerning this article should be addressed to Abigail A. Camden, Department of Psychology, Agnes Scott College, Decatur, GA 30030.

e-mail: camden.abigail@gmail.com

special issue 2018

psi chi journal of psychological research
Role of Self-Compassion on College Students’ Social Self-Evaluations and Affect Across Two Domains

Zenab Saeed and Tammy L. Sonnentag
Xavier University

ABSTRACT. Students regularly engage in self-evaluations by comparing their performance to their peers’ performance (Strickhouser & Zell, 2015), which may influence their feelings about themselves and willingness to persist in college. Because failure is a natural component of learning, it is important to examine how to promote students’ development when performance is weak relative to their peers. The current study examined if self-compassion moderates the impact of social comparisons on students’ self-evaluations and affect across two domains relevant to college life: academic and interpersonal competence. Students (N = 245) completed a test of academic or interpersonal skills and then received either no feedback or false feedback reporting their performance as below average, average, or above average relative to peers. Participants then completed measures of self-evaluation, affect, and self-compassion. In the academic, \( F(4,103) = 9.20, p < .001, R^2 = .26, p < .001 \), and interpersonal, \( F(4,105) = 14.88, p < .001, R^2 = .36, p < .001 \), domains, participants reported more negative affect (but not self-evaluations) when performance was below average compared to average, above average, or when no feedback was given. Self-compassion was associated with more positive affect, \( \beta_s > .25, p < .001 \), and less negative affect, \( \beta_s < -.28, p < .001 \), in both domains, with the impact of self-compassion in the interpersonal domain particularly important for positive affect, \( F(7, 102) = 13.74, \Delta R^2 = .15, p < .001 \), when performance was average or above average. Increasing students’ self-compassion shows potential for shaping their reactions to social comparisons.

In the United States, undergraduate enrollment in degree-granting institutions increased 31% from 2000 to 2014, and of the 17.3 million students beginning the journey to earning a bachelor’s degree in 2014, only about 60% will persist to finish within 6 years (National Center for Education Statistics [NCES], 2017). Students’ persistence (or lack thereof) in college may be due to their ability to adapt to rigorous academic expectations and new social responsibilities (Jackson, Pancer, Pratt, & Hunsberger, 2000). Many students are ill-prepared for the academic and social challenges that the college environment provides, and they may rely on their peers for feedback about their own ability to succeed. That is, students’ persistence in college may be, in part,
attributable to their evaluation of their abilities, behaviors, and skills relative to their peers. When students evaluate themselves relative to their peers, they engage in social comparisons (Alicke, Zell, & Guenther, 2013; Festinger, 1954). Because college is a time for individuals to learn from their failures as well as successes, it is important to study the impact of social comparisons on students, as well as the factors that may foster student success even in the face of failure. The current study examined the impact of peer comparisons on students’ self-evaluations and affective reactions across two important domains relevant to college life: academic and interpersonal competence. The current study also examined if self-compassion moderates the influence of students’ self-evaluations and affective reactions following peer comparisons in each domain.

Social Comparisons
In response to perceiving potential differences in one’s abilities, behaviors, or skills relative to peers, individuals often engage in social comparisons as a means of self-evaluation (Alicke et al., 2013; Festinger, 1954). According to social comparison theory, people are innately motivated to evaluate themselves relative to others (Festinger, 1954). Social comparisons, which may occur in many different domains (e.g., school, work, hobbies), typically happen in an upward (i.e., comparing oneself to higher achieving others) or downward (i.e., comparing oneself to lower achieving others) manner and involve individuals evaluating their abilities relative to another person’s abilities in the same domain. Through comparisons with others, individuals learn about themselves—their opinions, their emotions, their abilities, and their personality or social traits—and come to feel positively or negatively about themselves as a result (Thornton & Arrowood, 1966). In fact, tests of social comparison theory (Festinger, 1954) revealed that upward social comparisons often decrease individuals’ subjective well-being, whereas downward social comparisons often increase individuals’ subjective well-being (Wheeler & Miyake, 1992). Because people are thought to compare themselves with others when they acquire information about others that is relevant to the self (Mussweiler, Rüter & Epstude, 2006), social comparisons may occur regularly in university settings as students are routinely exposed to, can obtain, or easily recall information about others’ performance relative to their own (Lee, 2014). One way in which university students regularly engage in social comparisons is through peer comparisons of academic performance.

Social comparisons in the academic domain.
Students’ academic self-comparisons to higher achieving peers (i.e., upward social comparisons) tend to leave them feeling dejected rather than inspired. For example, Buunk, Kuyper, and van der Zee (2005) demonstrated that students report experiencing more negative affect following reflection on situations in which they were outperformed by their peers (e.g., “How often did you receive a lower grade than the classmate with whom you compared yourself?”), rather than when they outperformed their peers (e.g., “How often did you receive a higher grade than the classmate with whom you compared yourself?”). Further, Buunk et al. (2005) demonstrated that students’ negative affective reactions to being outperformed by their peers were heightened when they identified with (i.e., frequently interacted with) the targets of their peer comparisons. Buunk et al. revealed that social comparisons to peers influences college students’ emotional reactions, which may impact their academic self-evaluations and desire to persist in college.

Evaluating university students’ academic skills and abilities is a ubiquitous component of higher education, especially because regular evaluations of students’ academic skills occur within the classroom (e.g., individual graded assignments, overall course grades) and across departments, colleges, or universities (e.g., GPA). Because university students regularly receive feedback about their academic skills and abilities, opportunities for academic social comparisons during college are pervasive. Such frequent academic social comparisons are likely to influence students’ self-evaluations and affective reactions.

For example, Strickhouser and Zell (2015) demonstrated the impact of academic social comparison on individuals’ self-evaluations and affective reactions by providing students false feedback on a test of their quantitative or verbal reasoning. Students learned that their quantitative or verbal reasoning skills were below average, average, or above average relative to their peers. Participants reported experiencing more negative self-evaluations and affective reactions when they believed that they ranked below their peers than when they ranked above their peers. Strickhouser and Zell’s research demonstrated that students’ emotions and their self-evaluations are (at least briefly) impacted by social comparisons in the academic domain.
Negative outcomes associated with students’ academic social comparisons to high achieving peers are not particularly novel. Specifically, Möller and Köller (2001) demonstrated that students report lower levels of satisfaction with their academic (i.e., math) abilities when they believe their performance is below average, rather than above average, relative to their peers. The findings by Strickhouser and Zell (2015) and Möller and Köller (2001) are consistent with dozens of educational and social psychological studies reporting the negative impact of social comparisons on self-evaluations following perceived poor performance relative to peers (Fiske, 2011; Krueger, 2000). Despite the large body of research on social comparisons in the academic domain, researchers have yet to fully examine the effects of social comparisons in other domains of importance to college students—especially the interpersonal (or social) domain.

**Social comparisons in the interpersonal domain.** The college experience includes both academic (intellectual) and interpersonal (social) pursuits. Results from the 2011 Pew Research Center poll suggest that 47% of the American public believes that the purpose of college is to teach work-related skills and knowledge. On the other hand, another 39% believe that college is an opportunity to grow personally and socially. Because college life offers a multitude of opportunities for students to grow both intellectually and personally, it is important to examine the impact of social comparisons in both the academic and interpersonal domains.

Of the limited existing research that has examined social comparisons in the interpersonal domain, results are strikingly similar to those found in the academic domain. For example, de Vries and Kühne (2015) examined the impact of social comparisons on individuals’ self-perceptions using social media. Just as social comparisons in academic settings create references for intellectual comparisons, comparisons to others via social media websites create the potential for social comparisons about social competence. In their study, de Vries and Kühne asked university students to complete measures assessing the frequency and duration of their Facebook use and the importance of Facebook in their lives. Participants then completed questionnaires assessing the frequency and intensity of their beliefs that social media content makes them feel like others live a better life than they do, and also reported self-perceptions of their own social competence. Results revealed that increased Facebook use was associated with stronger beliefs that others live better lives and lower confidence in one’s own social competence. Consistent with findings in the academic domain, de Vries and Kühne’s (2015) results suggest that social comparisons in the social (i.e., interpersonal) domain impact self-evaluations, especially in reference to those perceived as superior to oneself.

Interestingly, individuals’ personal experiences with social comparisons on social media are consistent with experimental studies examining social comparison’s impact on self-evaluations via social media. Vogel, Rose, Roberts, and Eckles (2014) used manipulated online social media profiles depicting college students as either socially competent or incompetent, and after viewing one of the profiles, participants reported more negative self-evaluations when exposed to peers depicted as socially competent compared to socially incompetent. These findings suggest that social comparisons in the interpersonal domain are quite powerful because students’ self-evaluations were impacted by exposure to peers’ abilities even when the social comparison information was not explicitly stated (i.e., participants were not explicitly told that they ranked above or below their peers in social competence).

It is clear that the academic and interpersonal domains are two important areas in which students learn about themselves, their abilities, and their skills relative to their peers. Given that students are frequently exposed to the failures and successes of their peers in a university setting, it is important to study the factors that promote students’ development (e.g., persistence), especially when their performance may be weak relative to their peers. One promising factor for promoting students’ positive self-evaluations following peer comparison is self-compassion.

**Self-Compassion**

Self-compassion involves being understanding and kind toward oneself, especially in negative situations (Neff, 2003). Rather than fixating on a perceived failure, individuals with high levels of self-compassion express kindness toward themselves by avoiding excessively harsh and critical judgments. When failure is experienced, self-compassion allows individuals to understand that the failure is an isolated event and part of their larger human experience (Neff, 2003).

When examining the effects of self-compassion on college students’ self-feelings following recalled experiences of failure, Leary, Tate, Adams, Allen,
and Hancock (2007) asked students to recall the worst thing that had happened to them during the previous 4 days that was or was not their fault. Students then rated how the situations made them feel using 20 affect-relevant terms (e.g., sad, humiliated), as well as the degree to which they experienced self-compassionate thoughts and reactions while recalling the situations. Results revealed that higher self-compassion was associated with fewer negative self-feelings, regardless of whether the participant was at fault for the negative situation. The study demonstrated that self-compassion may serve as a buffer against students’ negative emotions following perceived failures.

The research by Leary et al. (2007) suggested that self-compassion is an important factor to examine when students experience failure. Additionally, Leary et al.’s research provided promise for examining if self-compassion can foster less negative (or more positive) self-evaluations and affective experiences among students whose academic or interpersonal performance in college is weak relative to their peers. Given that previous research has demonstrated that heightened self-compassion promotes greater levels of well-being among university-aged students (see Gunnell, Mosewich, McEwen, Eklund, & Crocker, 2017), such research has implications for the potential role of self-compassion in promoting persistence among students whose performance is poor relative to peers. However, to our knowledge, no existing research has examined the impact of self-compassion on students’ self-evaluations when they engage in social comparisons in the academic and interpersonal domains. The current study attempted to bridge this gap in the literature by examining if self-compassion moderates the effect of social comparisons on college students’ self-evaluations in the academic and interpersonal domains.

Current Study
Extending previous research on social comparisons, the current study examined the impact of self-compassion on students’ self-evaluations and affective reactions following social comparisons in two domains important to college life: academics and interpersonal competence. It was hypothesized that, regardless of domain (i.e., academics or interpersonal), participants would report more negative self-evaluations and affective reactions following comparisons to peers believed to be more successful than less, or equally as, successful as themselves. It was also hypothesized that self-compassion would attenuate the negative impact of peer comparisons on students’ self-evaluations and affective reactions, and this would be especially true when students’ perceived their performance to be below average relative to their peers.

Method
Participants
Participants included 243 undergraduate students (80 men, 163 women), ranging in age from 17 to 39 (M = 19.68, SD = 1.67), from a private university in the Midwest. The majority of students were in their second (31.5%) or third (30.6%) year of college, with self-reported GPAs ranging from 1.90 to 4.00 (on a 4.00 scale; M = 3.25, SD = 0.53). All participants provided written informed consent prior to taking part in the study.

Materials
Descriptive statistics for, and correlation coefficients among, the measures reported below are provided in Table 1.

Academic skills tests. An 8-item test ostensibly assessed college students’ academic competence. The academic skills test assessed students’ knowledge in the areas of quantitative (4 items) and verbal (4 items) reasoning and was adapted from Strickhouser and Zell’s (2015) original 35-item Quantitative and Verbal Reasoning Tests. Participants read the relatively challenging quantitative or verbal reasoning items and were asked to select the correct answer from four or five response options. This test was not scored in the current study; the test served as the ruse for providing participants false feedback about their academic competence relative to their peers (see similar methodology by Strickhouser & Zell, 2015).

Interpersonal skills test. An 8-item test

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Positive Affect</td>
<td>--</td>
<td>.03</td>
<td>.38</td>
<td>.21</td>
<td>.04</td>
<td>3.49</td>
<td>1.27</td>
<td>.91</td>
</tr>
<tr>
<td>2. Negative Affect</td>
<td>--</td>
<td>-.42</td>
<td>-.28</td>
<td>-.25</td>
<td>2.17</td>
<td>1.22</td>
<td>.92</td>
<td></td>
</tr>
<tr>
<td>3. Self-Compassion</td>
<td>--</td>
<td>.36</td>
<td>.42</td>
<td>3.95</td>
<td>.86</td>
<td>.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Academic Evaluation</td>
<td>--</td>
<td>.22</td>
<td>4.40</td>
<td>.81</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Interpersonal</td>
<td>--</td>
<td>3.64</td>
<td>1.28</td>
<td>.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05; **p < .01.

Saeed and Sonnentag | Social Self-Evaluations
ostensibly measured college students’ interpersonal competence. The interpersonal competence test was adapted from Moscovitch, Rodebaugh, and Hesch’s (2012) Imagined Social Blunders Measure. The original Imagined Social Blunders measure assesses students’ social skills by posing eight brief scenarios. In the current study, four possible “solutions” to the social blunders were created as response options. Participants selected which of the four possible solutions they would use if they experienced each social blunder. Consistent with the academic skills test, the interpersonal skills test was not scored in the current study; the test served as the ruse for providing participants false feedback about their interpersonal competence relative to their peers.

**Peer comparison feedback.** Prompts, adapted from Strickhouser and Zell (2015), provided participants false feedback on either the academic or interpersonal competence tests. Specifically, participants learned that their academic or interpersonal competence was below average, average, or above average relative to 259 of their peers. Participants in the control group did not receive any peer comparison feedback.

**Academic self-evaluation.** Participants’ academic self-evaluations were measured using 10 items from Meagher (2012), and assessed participants’ confidence in their academic skills and abilities. Participants rated each item on a 7-point Likert-type scale ranging from 1 (very unlike me) to 7 (very like me). Scores were averaged after reverse scoring the five negatively keyed items. Higher scores reflect more positive academic self-evaluations.

**Interpersonal self-evaluation.** The interpersonal self-evaluation measure consisted of eight items assessing participants’ confidence in their social skills (see Cambron, Acitelli, & Steinberg, 2010). Participants rated each item using a 7-point Likert-type scale ranging from 1 (very unlike me) to 7 (very like me). Scores were averaged, with higher scores reflecting more positive interpersonal self-evaluations.

**Positive and negative affect.** Participants’ positive and negative affective reactions were measured using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS includes 20 emotions, half positive and half negative. Participants rated their experience of each emotion using a 7-point Likert-type scale ranging from 1 (very slightly or not at all) to 7 (extremely). Scores for the 10 positive and 10 negative emotions were averaged, with higher scores reflecting more positive and more negative affect, respectively.

**Self-compassion.** Participants’ abilities to be sympathetic and understanding toward themselves instead of unkind and self-critical were measured using Neff’s (2003) 26-item self-compassion measure. Participants responded to the items using a 7-point Likert-type scale ranging from 1 (almost never) to 7 (almost always). Scores on the items were averaged after reverse-scoring the 13 negatively keyed items. Higher scores reflect a higher degree of self-compassion.

**Procedure**

Xavier University IRB approval was obtained prior to conducting the present study. One female experimenter conducted the data collection sessions in computer-equipped classrooms on the university’s campus. At the beginning of each session, participants completed an informed consent document and were then randomly assigned to one of eight conditions reflecting whether they would complete an academic or interpersonal skills test and receive no, below average, average, or above average false peer comparison feedback. Subsequently, participants received a slip of paper containing a secure transfer protocol (https://) that directed them to a Qualtrics survey. Upon entering the secure transfer protocol into a web browser, participants completed either an academic or interpersonal competence test and then learned that, relative to their peers, their performance on the test was below average, average, or above average. In the control condition, no peer comparison feedback was provided. The use of Qualtrics, an online survey system, to administer the academic and interpersonal competence tests, as well as the false peer comparison feedback, increased the mundane realism of the study. Participants received what they perceived to be “real-time” feedback on their performance on the academic or interpersonal competence tests and, given that participants believed that their test score was compared to 259 of their “peers” who had ostensibly also completed the tests, the electronic “calculation” of their performance relative to their peers was likely perceived as realistic. After learning of their performance on the academic or interpersonal competence test relative to their peers, participants completed the self-evaluation measure relevant to the test they completed. Finally, participants were asked to complete the PANAS and self-compassion measures, followed by a demographic questionnaire that included a manipulation check item. After
participants completed these tasks, they were fully debriefed. At debriefing, participants were told that they were randomly assigned to complete a test of academic or interpersonal ability and then received false feedback reporting their performance as either below average, average, above average, or unknown relative to their peers. Participants were also informed that, in reality, their actual academic or interpersonal performance was not assessed and the feedback given was “fake.” After hearing the debriefing information, participants were asked to keep the purpose of the study confidential, asked if they had any questions, and thanked for their participation.

Results

Data from 25 (10.3%) participants who incorrectly answered a manipulation check item concerning what peer comparison feedback they received on the academic or interpersonal competence test (i.e., no feedback, below average, average, or above average relative to peers) were excluded from the analyses reported below. For the data analyzed below, in the academic and interpersonal domains, participants learned their skills were below average \((n = 28/28)\), average \((n = 27/33)\), above average \((n = 33/31)\), or unknown \((n = 20/18)\) relative to their peers, respectively.

To test the current study’s prediction that self-compassion would moderate the influence of peer comparison feedback on students’ self-evaluations and affective reactions following peer comparisons in the academic and interpersonal domains, hierarchical regression analyses were conducted. Separate regression analyses were conducted for students’ self-evaluations and (positive and negative) affective reactions in both the academic and interpersonal domains. Separate regression analyses were conducted for the domain of the competence test (i.e., academic or interpersonal) on self-evaluation and affective reactions because including domain as a between-subjects factor in the regression would lead to comparisons outside the scope of the current study (i.e., dimensional comparisons; see Strickhouser & Zell, 2015). In all the regressions reported below, the first step included dummy-coded scores for peer comparison feedback (i.e., no feedback, below average, average, above average) and standardized self-compassion scores. The second step of the regressions included the product terms carrying the interaction between peer comparison feedback and self-compassion.

Self-Evaluations

As seen in Table 2, peer comparison feedback was not significantly associated with students’ self-evaluations in either the academic or the interpersonal domains. However, the regression analyses revealed a unique main effect of self-compassion on students’ academic self-evaluations, but not interpersonal self-evaluations. Specifically, heightened self-compassion was associated with more positive self-evaluations in the academic \((\beta = 0.34, t = 3.77, p < .001)\) but not interpersonal \((\beta = 0.19, t = 1.72, p = .09)\) domain. The interaction between peer comparison feedback and self-compassion on students’ self-evaluations in the academic and interpersonal domains was not significant.

Affective Reactions

As described above, hierarchical regression analyses were used to examine if self-compassion moderates the influence of social comparison feedback on students’ affective reactions following peer comparison feedback in the academic and interpersonal domains. As seen in Table 3, the regression analyses revealed unique main effects of peer comparison feedback on students’ affective reactions. For ease of interpretability, the main effects of peer comparison feedback on participants’ affective reactions were probed using one-way Analyses of Variance, with self-compassion scores entered as a covariate. As seen in Table 4, when examining students’ affective reactions to peer comparison feedback, for both the academic and interpersonal domains, participants reported more negative affect when performance was perceived as below average.

| TABLE 2 |
|---------------------------------|--------------|--------------|-----------------|-----------------|
| **Hierarchical Regression Analyses for the Role of Self-Compassion on College Students’ Self-Evaluations Following Peer Comparison Feedback** |
| Variable                        | Academic Domain | Intercept | \(R^2\) | \(R^2\)  |
| Peer Comparison Feedback        | \(\beta\)       | \(F\)      |             |               |
| Below Average vs. Control       | -.12            | .04         | .04         | .044           |
| Average vs. Control             | -.27            | .13         | .13         | .131           |
| Above Average vs. Control       | -.10            | .01         | .01         | .012           |
| Self-Compass                   | .34*           | .19         | .19         | .193           |
| **Step 2**                      | \(2.92^*\)     | .01         | .06         | .057           |
| Peer Comparison x Self-Compass  | .24            | .43*        | .43*        | .431           |
| Note: Peer Comparison Feedback was dummy-coded with the no feedback (control) group serving as the (0) reference group. "p < .01: *p < .001." |
compared to average, above average, or when no feedback was given. In contrast, participants reported experiencing more positive affect in the academic (but not the interpersonal) domain when performance was perceived to be above average compared to average, below average, or when no feedback was given.

The regression analyses also revealed unique main effects of self-compassion on participants’ positive and negative affective reactions in the academic and interpersonal domains (see Table 3). Specifically, heightened self-compassion was associated with more positive and less negative affect in both the academic and interpersonal domains. Finally, the regression analyses revealed a significant interaction between peer comparison feedback and self-compassion on participants’ positive affect in the interpersonal domain. As seen in Figure 1, as self-compassion increased, participants reported more positive affect, especially when they believed their performance was average ($\beta = 1.14$, $t = 7.01$, $p < .001$) or above average ($\beta = 1.24$, $t = 5.38$, $p < .001$) relative to their peers. However, self-compassion was unassociated with participants’ positive affect when their performance was perceived as below average ($\beta = 0.45$, $t = 1.91$, $p = .06$) or unknown ($\beta = 0.20$, $t = 1.60$, $p = .11$) relative to their peers.

**Discussion**

Extending previous research, the current study examined if self-compassion moderates the impact of social comparisons on college students’ self-evaluations and affective reactions in the academic and interpersonal domains. For both domains, participants reported more negative affect (but not more negative self-evaluations) when they believed their performance was below average compared to average, above average, or unknown, relative to their peers. Heightened self-compassion was uniquely associated with more positive and less negative affective responses (and lower academic self-evaluations) in both the academic and interpersonal domains. Further, self-compassion moderated the effect of social comparisons on students’ positive affective responses within the interpersonal domain. Specifically, self-compassion was especially impactful on students’ positive affective reactions when they received average or above average social comparison feedback about their interpersonal competence compared to when below average or no feedback was provided.

---

**TABLE 3**

Hierarchical Regression Analyses for the Role of Self-Compassion on Affective Reactions Following Peer Comparison Feedback

<table>
<thead>
<tr>
<th>Variable</th>
<th>Positive Affect</th>
<th>Interpersonal Domain</th>
<th>Negative Affect</th>
<th>Interpersonal Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Academic Domain</td>
<td>Interpersonal Domain</td>
<td>Academic Domain</td>
<td>Interpersonal Domain</td>
</tr>
<tr>
<td>Step 1</td>
<td>$\beta$</td>
<td>$F$</td>
<td>$R^2$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>Peer Comparison Feedback</td>
<td>8.88***</td>
<td>.26***</td>
<td>13.47***</td>
<td>.34***</td>
</tr>
<tr>
<td>Below Average vs. Control</td>
<td>-.22</td>
<td>-.32***</td>
<td>.29</td>
<td>.25</td>
</tr>
<tr>
<td>Average vs. Control</td>
<td>-.15</td>
<td>-.46***</td>
<td>-.02</td>
<td>-.10</td>
</tr>
<tr>
<td>Above Average vs. Control</td>
<td>.24</td>
<td>-.33***</td>
<td>-.12</td>
<td>-.10</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>.25**</td>
<td>.63***</td>
<td>-.32**</td>
<td>-.28**</td>
</tr>
<tr>
<td>Step 2</td>
<td>5.30***</td>
<td>.01</td>
<td>13.74***</td>
<td>.15***</td>
</tr>
<tr>
<td>Peer Comparison x Self-Compassion</td>
<td>.22</td>
<td>.20</td>
<td>-.27</td>
<td>-.14</td>
</tr>
</tbody>
</table>

Note. Peer Comparison Feedback was dummy-coded with the no feedback (control) group serving as the (0) reference group. *$p < .05$.*  **$p < .01$.*** $p < .001$. 

---

**FIGURE 1**

For the interpersonal domain, interaction between peer comparison feedback and self-compassion on positive affect.
In general, the present findings yielded valuable information about the role of self-compassion on college students’ self-evaluations and affective reactions following peer comparison feedback, as well as questions that provide important directions for future research on the topic.

When participants learned that their academic or interpersonal skills were below average relative to their peers, they experienced more negative emotions, but not more negative self-evaluations. The students’ heightened negative affect following social comparison to better performing peers is consistent with research demonstrating that students experience heightened negative feelings when they believe they are outperformed by peers (Buunk et al., 2005). Although students in the current study experienced an immediate “sting” of negative emotion when their performance was believed to be poor (i.e., below average) compared to average, above average, or unknown relative to their peers, the effect of poor performance was insufficient to impact their self-evaluations. These findings suggest that students’ self-evaluations of their academic or interpersonal skills may be relatively stable and that a single instance of negative social comparison is insufficient to alter their self-evaluations. Such a suggestion, although inconsistent with research by Strickhouser and Zell (2015), is not unfounded, given that social psychologists have argued that individuals’ attitudes (toward themselves and others) are best predicted by examining an aggregate of situations and experiences, rather than isolated events (Rushton, Brainerd, & Pressley, 1983). Because university-aged students frequently confront instances of academic and interpersonal failure, future research should examine the extent to which repeated experiences of negative social comparisons affect individuals’ self-evaluations. Although such research possesses ethical challenges if pursued experimentally, retrospective self-reports and prospective longitudinal studies provide the means for researchers to determine how frequent or powerful (negative) social comparisons must be to affect individuals’ self-evaluations.

One of the primary purposes of the current study was to examine if self-compassion influences individuals’ self-evaluations and affective responses following social comparisons in two domains. It was predicted that self-compassion would attenuate the potential negative impact of peer comparisons on students’ self-evaluations and affective reactions, and that this would be especially true when students perceived their performance as below average relative to their peers. Although not precisely as predicted, results revealed that heightened self-compassion predicted more positive affect in the interpersonal (but not the academic) domain, with the impact of self-compassion especially influential when performance relative to peers was perceived as average or above average (compared to below average or unknown). This pattern of results suggests that students’ abilities to hold sympathetic and understanding attitudes toward themselves (rather than unkind and self-critical attitudes) is particularly advantageous when they perform well (i.e., average or above average) relative to their peers. It is likely unsurprising that students who treat themselves with understanding and kindness feel better about themselves and their performance compared to students who treat themselves relatively critically and harshly. Such findings are consistent with research demonstrating that relatively high levels of self-compassion can heighten the impact of positive events and buffer individuals against the impact of negative events (Leary et al., 2007). Students with relatively high levels of self-compassion may understand that successes, like failures, are experienced by everyone, and therefore may not overvalue or undervalue their experiences relative to others. Possessing relatively high levels of self-compassion in higher education may allow individuals to experience successes and failures as part of the “learning journey” and, ultimately, help them to persist in college.

Unexpectedly, self-compassion did not influence participants’ self-evaluations or affective reactions when their academic or interpersonal skills were perceived as below average (or were unknown) relative to their peers. Although previous research has demonstrated that self-compassion is

<table>
<thead>
<tr>
<th>TABLE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Marginal Means (and Standard Errors) for Peer Comparison Feedback on Students’ Affective Reactions</td>
</tr>
<tr>
<td><strong>Peer Comparison Feedback</strong></td>
</tr>
<tr>
<td><strong>Academic Domain</strong></td>
</tr>
<tr>
<td>Positive Affect</td>
</tr>
<tr>
<td>Negative Affect</td>
</tr>
<tr>
<td><strong>Interpersonal Domain</strong></td>
</tr>
<tr>
<td>Positive Affect</td>
</tr>
<tr>
<td>Negative Affect</td>
</tr>
</tbody>
</table>

Note: Means in the same row with different superscripts differ at p < .05.
associated with fewer negative self-feelings following recollections of negative events (see Leary et al., 2007), levels of self-compassion in the current study did not affect individuals’ self-views or self-feelings following perceived failure. One explanation for these nonsignificant findings may be that students’ attributions of blame for poor performance was directed externally rather than internally (Shukla, 1994). Specifically, it is possible that students who learned that their academic or interpersonal skills were below average relative to their peers were more likely to make external attributions (e.g., blame the test or the researcher) rather than internal attributions (e.g., blame their own ability or effort). If students attributed poor performance to explanations external to themselves, heightened levels of self-compassion would be unnecessary because there would be no need to display kindness toward oneself or avoid excessive critical judgments for failure (Neff, 2003). Such a suggestion warrants an important direction for future research on social comparisons. Specifically, one fruitful direction for future research is examining if self-compassion is associated with less negative self-evaluations and affective reactions, following poor performance relative to peers, for students who tend to make internal attributions rather than external attributions for failure. For students who tend to blame themselves for poor (academic or interpersonal) performance, self-compassion may be an important variable predicting their willingness to overcome the challenges and persist in college.

Limitations and Future Directions

The present findings contributed to the understanding of social comparisons in two domains important to college life: academic and interpersonal. The current findings also contributed knowledge to the role of self-compassion on individuals’ affective reactions and self-evaluations following peer comparisons. Despite the value of the current work, the limitations provide important directions for future research.

Although the current study was designed to examine college students’ affective reactions and self-evaluations following peer comparison feedback within two distinct domains, utilizing separate self-evaluation measures for the academic and interpersonal domains prevented examining if social comparison feedback affects self-evaluations between domains. Specifically, because the self-evaluation measures were domain specific (i.e., academic or interpersonal), it was impossible to examine if social comparison in the academic domain influenced self-evaluations in the interpersonal domain. Such cross-domain comparisons are called dimensional comparisons and occur when individuals compare their ability in one domain to their ability in a second domain. Research on dimensional comparisons reveals that peer comparisons in one domain (e.g., verbal reasoning) influence individuals’ self-evaluations in a second domain (e.g., quantitative reasoning; Strickhouser & Zell, 2015). Consequently, future research examining college students’ perceptions of their academic and interpersonal performance relative to peers should examine if, for example, superior performance in one domain compensates for poor performance in another domain.

Although the current study revealed that, in both the academic and interpersonal domains, participants reported more negative affect (but not more negative self-evaluations) when performance was below average compared to average, above average, or when no feedback was given, it is unclear if participants truly believed the false peer comparison feedback. Given individuals’ tendencies to engage in self-serving ideations (Campbell & Sedikides, 1999), participants might have discredited or even rejected the feedback received on their performance. Although the pattern of results in the current study suggests that participants generally believed the feedback, future research should include a manipulation check. If the experimental realism of such future research is strong, inclusion of a manipulation check will provide support for studying social comparisons using false feedback.

Despite the value of studying social comparisons and self-compassion among college students, the current study involved a cross-sectional sample of students from a single university receiving a single incident of social comparison feedback. Further, despite being limited by its use of undergraduates completing self-report measures, this study made an important contribution to the research literature examining how self-compassion may influence individuals’ self-evaluations and affective responses following peer comparison feedback in two domains. Because students at all levels of educational attainment frequently confront instances of failure relative to peers, future research should examine the impact of academic and interpersonal social comparisons on individuals’ self-evaluations in elementary, middle, and high school. Such research may help to reveal the potential developmental impact of negative social comparisons on individuals’ persistence in higher education.
Conclusion
The current study meaningfully contributed to the literature on social comparisons by examining how self-compassion impacts individuals’ negative self-evaluations and affective reactions when performance is poor relative to others. Although there is much research yet to be conducted on the role of social comparisons in a university setting, the present data suggest that fostering self-compassion among college students may be a promising way to improve their experiences, thereby hopefully encouraging persistence in higher education.

References

Author Note. Zenab Saeed, School of Psychology, Xavier University; Tammy L. Sonnentag, School of Psychology, Xavier University. Special thanks to Psi Chi Journal reviewers for their support.

This manuscript qualifies for an Open Materials badge; the materials are available at https://osf.io/cjuf/.

Correspondence concerning this article should be addressed to Zenab Saeed, School of Psychology, Xavier University, Cincinnati, Ohio, 45207-6511, USA. E-mail: saeedz@xavier.edu
informed consent is a critical component of all research involving human subjects. The American Psychological Association (APA) requires that informed consent procedures use reasonably understandable language in order to ensure fully informed consent from individuals or individuals' caretakers if individuals are incapable of consenting on their own. Consent must be documented in either oral or written form. This dictum is quite clear, but assuring that participants fully understand the contents of a written informed consent document may not be so simple. Some participants may willingly sign and consent to participate in a psychological experiment whether or not they attended to the details of the document and fully understand the document. This calls into question the ethical soundness of such consent procedures.

There is considerable and growing evidence that research participants do not always completely read through consent forms and may be missing key details in the consent process (Perrault & Nazione, 2016). This could be either due to participants not knowing what is expected of them or not knowing what the possible risks are. Flory and Emanuel (2004) conducted a meta-analysis of 30 studies and reviewed effective ways to improve participant understanding of consent forms. They found that education level was associated with the extent of understanding of consent forms. Specifically, those with a higher level of education were likely to understand consent forms more thoroughly. According to Flory and Emanuel (2004), revised consent forms meant to improve participants' understanding of material had a negligible effect on understanding, but those who read at a seventh and eighth-grade level scored significantly lower than those with a higher reading level. Because

**ABSTRACT.** In the present study, we tested to see if participants were attentive to details in the consent form for a psychological experiment before signing it. Our initial hypothesis was that participants might not read attentively, due to perceiving the information to be mundane. Depending on condition, the code word was placed in an early, middle, or late section of the consent form. This experiment allowed us to analyze whether participants read through the consent form, and if they paid more attention to a specific part of the form than others. We asked participants to read through the consent form and sign at the bottom when they were finished. Following their signed consent, we orally gave instructions on how to complete the filler task. At the conclusion of the study, participants were given a prompt to recall the code word. The results of this preregistered study show that, of the 136 participants, only 20 participants correctly recalled the code word. A $\chi^2$ test of independence revealed that successfully noticing the code word did not depend on the location on the consent form, $\chi^2(2, N = 136) = 0.67, p = 0.72, \phi = 0.07$. The results of this study show that students did not differentially respond to different parts of the consent form.
first-year college students are generally past this reading level, there is likely little effect of education on recall responses for these participants. Another study looked into whether participants could recall information about consent forms after signing them (Pedersen, Neighbors, Tidwell, & Lostutter, 2011). By asking participants to directly recall information provided in a consent form, the researchers attempted to determine whether participants thoroughly examined the information in the consent form or not. Results indicated that participants were only able to recall a randomly assigned word about 25% of the time. Participants missed about 33% of the information in the risk section of the consent form, more than 50% were unaware that their data would be anonymous, and 15% of participants did not know about a significant instruction inside the consent form. These studies show that consent forms rarely receive participants’ full attention. To improve attention in this area, it is important to identify and understand what causes an individual to be inattentive.

It is also important to understand why individuals decide to consent without being informed, as well as their level of competence. The reasons that many participants admittedly do not understand a document but still sign may include the formal and official style of the document, a feeling of time pressure, and an inadequate style of presentation of the materials included on a consent form document (Wogalter, 1999). Participants may be more likely to read all legal documents including consent forms if the language in them was much less formal. By making documents less intimidating, through informality or by providing oral as well as written instructions, researchers could allow participants to feel more relaxed and fully informed. Participants also may be more likely to read an entire form if there is not a sense of being rushed to read through and sign the document. It is difficult to be certain if a typically functioning individual has given fully informed consent, and it is ethically questionable whether to accept a signed consent form if an individual has an impairment.

One necessary precondition for fully informed consent is that participants be adequately motivated to read and understand the consent form. Without motivation, individuals are unlikely to thoroughly read through any forms. Motivation is often divided into two categories: extrinsic and intrinsic. Extrinsic motivation is anything that an individual finds motivating on an external level such as money, food, or attention. Intrinsic motivation is anything that an individual finds motivating on an internal level such as succeeding or performing well. When individuals are not internally motivated to complete a task, they run the risk of mindlessly performing at a level below their competency, as well as the chance of carelessly responding. Careless responding can be due to the expectation that their responses are unimportant, which may result in having little motivation to respond appropriately (Taylor, Bailey, & Barber, 2015).

Although our focus was on attentiveness in the informed consent process, we reviewed research on general research participant attentiveness, and the evidence suggests inattentiveness should be a major concern for researchers. There are three general methods of screening participants: archival, statistical, and self-report (Desimone, Harms, & Desimone, 2015). The archival category uses pattern recognition such as when a participant responds similarly to every single item. The statistical category looks into inconsistent patterns such as when similar items are answered in dissimilar ways. Self-report involves asking participants about their level of attentiveness for the given task. Being able to identify participants carelessly responding in a study would be beneficial to determining if participant data is fully reliable. Meade and Craig (2011) looked into ways to identify careless response data. Over two studies, five methods were tested to determine whether they could be used to effectively identify careless response data. The results showed that about 12% of college-aged participants responded carelessly during a lengthy survey.

It is necessary to be able to identify careless responses that skew results and cause inconsistencies, in order to draw valid and reproducible conclusions. According to Meade and Craig (2011), there are two patterns of careless response: random and nonrandom responses. With the two patterns, there are five methods of identifying careless responses, which include (a) items to detect careless response inside the study, (b) response consistency indices made in conjunction with established survey items, (c) multivariate outlier analysis, (d) response time, and (e) self-report (Meade & Craig, 2011). Once participants have been identified as being inattentive or careless with their responses, the question becomes whether they should be filtered out or not. When deciding if participants should be filtered out, it is important to determine whether the data for a whole participant should be filtered out or only certain specific data that deviated significantly from that of the mean (Rios, Guo, Mao,
& Liu, 2016). If the filtering process eliminates all data for a specific participant, it may be explained that the single participant was inattentive. It is important to be able to tell if a participant was inattentive purely during the consent form portion, or during the entire experiment.

Predictions
In research by Pedersen et al. (2011), participants were unable to recall specific information about the consent forms that they had signed. In the present study, we only asked participants to recall a specific word that was labeled as the desired word via specification “Code word: Opera.” Although participants in the previous study were shown to not recall information, we believed that participants would accurately read and recall the code word at a higher rate because it was on its own individual line, right above a new section of the form. Therefore, although the bulk of the text might seem mundane and easy to forget, we expected the random code word to catch participants’ attention. Thus, our procedure seemed to test a “lower bar” of participant attentiveness by assessing not general attention and memory, but the identification of a quite strange and surprising insertion into the consent form. Our primary prediction was that participants would be unlikely to accurately recall the code word prompt. Our secondary prediction was that participants would be equally inattentive to the code word at the middle of the form and the end of the form.

Method
Participants and Design
Participants were 136 undergraduate psychology students attending a small, private, Midwestern university (46 men and 90 women) participating in exchange for partial course credit. This study accounted for 1/12 of the participation credit for their introductory psychology class. The independent variable in this experiment was the location of a code word included in an existing consent form that was randomly assigned into three groups (top, middle, and bottom). There were eight locations, split into three categories. We randomly assigned participants across the three categories, and then within each category they were randomized across specific locations. For participants randomly assigned to the top group, we placed the code word directly above the first and second segments of the form, which contained the purpose, background, and procedure sections. For participants randomly assigned to the middle group, we placed the code word above the third, fourth, fifth, and sixth segments of the form, which contained the risks/discomforts, benefits, costs, and payment sections. For participants randomly assigned to the bottom group, we placed the code word above the seventh and eighth segments of the form, which contained questions and consent sections of the form. The dependent variable was a dichotomous variable representing whether or not the participant correctly reported the code word.

Materials
We gave participants a pencil and the sheets necessary to complete the attentiveness task. A set of eight copies of the consent form was created with the code word being placed above a different section of the form. The consent forms were identical except for the placement of the code word. Each code word was placed directly above the beginning of the new section. We randomly assigned one of eight copies of the consent form with a code word placed into the form to the participants. We also gave participants a filler task to complete between signing the consent form and being asked to produce the code word. This filler task was unrelated to the present study. Finally, participants were given a question sheet with the code word recall prompt, “what is the code word?”

Procedure
After institutional review board approval (09-09-2015#012) was given, we randomly assigned each participant to a condition using a random number generator. When participants arrived, we gave them a consent form to sign. We then told participants to read through the consent form and sign it when they had finished reading. After participants signed the consent form, we read the instructions of the filler task orally as we gave them materials to complete the filler experiment. Following the completion of the filler task, participants were given a third sheet of paper, which we described as a demographic sheet. This sheet included questions and consent sections of the form. The consent forms were identical except for the placement of the code word. Each code word was placed directly above the beginning of the new section. We randomly assigned one of eight copies of the consent form with a code word placed into the form to the participants. We also gave participants a filler task to complete between signing the consent form and being asked to produce the code word. This filler task was unrelated to the present study. Finally, participants were given a question sheet with the code word recall prompt, “what is the code word?”

Notes
1The original goal of this preregistered experiment was to collect data from 100 participants. More participants volunteered than the initial goal for this experiment, prior to the predetermined final collection date.
Results
We were interested in assessing if participants were more attentive to details in certain areas of the consent forms than in other areas (see Table 1). Of the 136 participants who completed the experiment, only 20 were able to accurately produce the hidden code word following the filler task. The vast majority of participants did not respond to the prompt asking for a code word; some provided an incorrect guess using words such as pizza, baseball, and password. Code word location and the frequency of correct responses were not significantly associated, $\chi^2(df = 2, N = 136) = 0.67, p = .72, \phi = 0.07$.

Discussion
The results of this experiment supported our primary hypothesis that participants in a psychology experiment would not thoroughly read through the consent forms given prior to the experiment being conducted. However, the results did not support our secondary hypothesis that there would be a difference in correct response rate depending on the location of the code word. There was no significant difference across groups in attentiveness, which shows a similarity to the results in Pedersen et al. (2011). There was a low rate of correct response and an overall low rate of attentiveness to the consent form. This shows that there is a need for ways to improve this inefficacy.

It is extremely important that those participating in experiments understand what they are giving consent to. Consent is a core element of both ethical treatment of human subjects and APA guidelines. Therefore, it is vital that participants at least understand what they can expect. Psychological study participants are typically attending due to some sort of reimbursement for their time. Because of this, they may not understand what the experiment involves and therefore may not put their best efforts into the study. After reading the consent form, it is possible that they do not understand what is being said due to the bulky formal language that is used in these consent forms, and therefore stop reading and just sign so as to not feel the need for clarification by the experimenter (Waggoner & Sherman, 1996).

By giving consent, participants are essentially saying that they understand and accept responsibility for what is expected of them as well as any distress, harm, or otherwise unexpected outcome that may occur. If participants do not know what they are giving consent to, a number of negative outcomes could occur: participants may not perform the procedures of the experiment correctly, leaving their results invalid or difficult to interpret; participants could endanger themselves due to a health complication involved in the experiment that they remain unaware of; participants could endanger others for their lack of understanding of what is expected of them; and other possibilities not specified. When participants give consent, an experimenter should not be expected to provide a repetition of what they have just given consent to. Because of this, it is assumed that participants are aware of what they have consented to.

There is a need to find effective ways to both allow participants to understand fully what they are consenting to, and keep the integrity of an experiment intact, without introducing demand effects (Orne, 1962). There is only so much a researcher can do to ensure that participants understand what is going on before it begins to skew the validity of the experiment (Mckibben & Silvia, 2016). With the increase in attempts to allow participants to be more attentive, experiments also run the risk of causing a social desirability bias (Clifford & Jerit, 2015). This is due to participants being aware that certain answers are being monitored, and therefore wanting to answer according to what would be viewed as “good” by others.

To accurately provide reliable results, researchers must use screening methods to adequately account for participant carelessness or insufficient effort. It is imperative to have similar, reliable, and valid sample sizes. To deem a study valid, results must be similar among multiple samples regardless of sampling strategies (Ran, Liu, Marchiondo, & Huang, 2015). Online studies have been shown to typically have a higher level of carelessness and insufficient effort responding than paper and pencil studies (Huang, Bowling, Liu, & Li, 2014). This shows that there are certain methods of conducting an experiment that can have an improved level of responding compared to other methods. Although the current study demonstrated the problem with attentiveness in paper and pencil consent forms, research has shown that online studies may suffer even more in attention levels. A way to improve

<table>
<thead>
<tr>
<th>Correct vs. Incorrect Responses by Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1 (Upper)</strong></td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Total Participants</td>
</tr>
</tbody>
</table>
this may be to screen attentiveness prior to gaining consent, which would ensure that participants understand what they are consenting to.

Limitations
This study provided a code word inside the consent form without any further clarification or acknowledgement of the code word, with the assumption that participants who read through the consent form would recall the code word at the end of the study. It was not directly stated where participants could find the code word, and it might have been confusing for participants to know where they could have found the word. There was also no clear direction to remember the code word, and being a pure recall task rather than a recognition task, some participants might have forgotten what it was during the time of the filler task.

Conclusion
It is concerning that fewer than 15% of the participants were able to recall the code word. Some of the possible routes in the future include: a larger participant pool, equivalent demographic groups, the addition of online participants, and obtaining an international participant pool (Flory & Emmanuel, 2004). Furthermore, it is necessary to provide more information regarding the location of the code word during the prompt. These routes will help with gaining more generalizable data and exploring possible differences related to participant characteristics. Further research should also include more clear information in the prompt as to where the participant could find the code word. Because this was potentially unclear for participants who thoroughly read the consent form, it might have skewed the results slightly.

Participants have been shown to be inattentive during psychological research, especially in the process of gaining consent. This may be due to a lack of motivation or a lack of understanding due to educational levels or the language of the consent form. The consent form signing procedure typically involves a bulk of information in a small area. This can be both intimidating to read through as well as mundane. This study demonstrated how imperative it is for further research to be conducted to aid participants in giving fully informed consent, rather than falling victim to inattentiveness.

References

Author Note. Derek A. Baker, Department of Psychology, Ashland University; Christopher R. Chartier, Department of Psychology, Ashland University. Derek Baker is now a student in the School Psychology Graduate Program at Miami University. Special thanks to Psi Chi Journal reviewers for their support.

This manuscript qualifies for an Open Materials and Data badge. The materials and data are available at https://osf.io/7wazk/ and the Preregistration is available at https://aspredicted.org/xyce3.pdf

Correspondence concerning this article should be addressed to Derek Baker, Department of Educational Psychology, Miami University, Oxford, OH 45056. E-mail: Bakerd@miamioh.edu
Exposure to Media on Perceptions of Violence as a Function of Trait Aggression and Athletic Status

Courtney D. Gross and Albee Therese O. Mendoza*
Wesley College

ABSTRACT. Little research has been conducted regarding the perceptions of violence and the variables that influence these perceptions, especially in a population primed for more aggressive behaviors than others: collegiate athletes. The present study examined the effects of trait aggression and exposure to media on perceptions of violence in athletes using a 2 x 2 x 3 design. Participants (N = 91) were randomly assigned to watch a violent or nonviolent video clip after completing a demographic questionnaire that included athletic status and a trait aggression questionnaire. After watching the clip, participants completed a provocation stories task. Although there was no main effect of exposure to media, $F(1, 79) = 0.18, p = .675, \eta^2_p = .002$, power = .070, there were main effects for trait aggression, $F(1, 79) = 16.47, p \leq .001, \eta^2_p = .173$, power = .980, and athletic status, $F(2, 79) = 4.88, p = .010, \eta^2_p = .110$, power = .789. No 2-way interactions were observed. Results indicated a statistically significant 3-way interaction, $F(2, 79) = 3.17, p = .047, \eta^2_p = .074$, power = .592. The study’s implications for college students, especially those with high levels of trait aggression, and future directions are discussed.

Research has shown that 75% of youth-oriented media contains violence (i.e., more severe types of aggression such as assault, shootings, or murder; Anderson & Bushman, 2001; Levermore & Salisbury, 2009). Some studies (e.g., Anderson & Dill, 2000) found that exposure to violent television shows or violent video games was positively correlated with violent thoughts, actions, and feelings in adolescents immediately following exposure. Other studies (e.g., Huesmann & Taylor, 2006) researched the enduring or long-term effects of violent media (e.g., retesting the same individuals 4 months to 15 years later) and found that fictional violence portrayed in media correlated with a long-term increase in acts of real-world violence.

Although there has been an abundance of research conducted regarding the effects of violent media on aggression, little research has been conducted regarding the perceptions of violence (i.e., the degree to which an individual identifies an act as violent; Kirsch & Olczak, 2002a) and the variables that influence these perceptions. Within the realm of psychology, it is important to study perceptions of violence because individuals’ perceptions regulate their behavioral and cognitive responses.

Exposure to Media

One variable that may influence a person’s perception of violence is observing violence. Children and adults both exhibit an increase in aggressive behaviors and thoughts after exposure to violent media such as video games, television commercials,
Exposure, Aggression, and Athletic Status  

Gross and Mendoza

and action movies (Brocato, Gentile, Laczniak, Maier, & Ji-Song, 2010; Buschling & Krahe, 2013; Huesmann & Taylor, 2006). A retrospective study by Levermore and Salisbury (2009) found that playing video games with high levels of violence increased positive beliefs about aggression (i.e., aggression is acceptable and beneficial) and correlated positively with verbal aggression over time.

The effects of media exposure can be immediate or cumulative, meaning that exposure over time accumulates and creates a lasting impact on behaviors and cognitions. Thus, the more an individual is exposed to violent media, the more stable the learned aggression. This can happen for several reasons.

According to social learning theory, an individual learns aggression, not only by directly performing aggressive acts, but also through observation and replication of such behaviors by other individuals (Bandura, 1973). For example, Lang (1999) found that individuals exposed to a violent video game, including individuals who merely watched the violent video game, demonstrated increased feelings of aggression compared to those exposed to a nonviolent video game. Furthermore, participants who actively played the violent video game reported even greater feelings of aggression. Notably, the active players did not significantly differ from those who simply observed the violent video game. These findings support social learning theory (Bandura, 1973) because participants who actively played did not differ significantly from those who merely observed.

In another facet of social learning theory, if an individual witnesses an act of aggression, that individual will be more likely to imitate that act of aggression later, especially if the act is successful in achieving the desired effect (Bandura, 1973). To illustrate, Miranda, McCluskey, Silber, von Pohle, and Bainum (2009) examined how play would be affected after a child viewed a 5-minute clip of a violent cartoon in the presence of a silent adult or an adult who vocally disapproved of the violence within the cartoon. They found that children with the silent adult present demonstrated more aggressive play and more verbal and physical aggression than children with the vocal adult. The study demonstrated the strength of a simple mediator in deterring aggressive behaviors that result from exposure to media violence.

Griffiths and Shuckford (1989) proposed another theory to explain this phenomenon. Desensitization theory suggests that exposure to second-hand violence in a relaxing setting, such as violence portrayed in media, results in diminished physiological responses to violence over time (Griffiths & Shuckford, 1989). They argued that desensitization arises when the stimuli being presented (e.g., the violent media) are no longer new and exciting. When individuals become desensitized to the stimuli, in this case violent media, they experience decreased psychological and physiological arousal. The violence is gradually viewed as commonplace and normal, which in turn makes aggressive cognitions and behaviors the norm as well. One longitudinal study of schoolchildren found that increased exposure to violent media in fourth grade decreased empathy levels in fifth grade; this, in turn, increased aggressive behaviors in sixth grade (Mößle, Kliem, & Rehbein, 2014). By promoting positive beliefs about aggression and increasing aggressive behavior, repeatedly, over time, exposure to violent media may cause individuals to perceive more instances of aggression and violence. Perhaps instead of external stimuli, there are internal or participant characteristics that may influence one’s perception of violence.

Trait Aggression

Another variable that may lead people to perceive violence is their own level of trait aggression. Higher levels of trait aggression (i.e., the degree to which an individual performs behaviors intended to inflict harm on another individual; Anderson & Bushman, 2001) may lead to an increase in perceiving aggression and violence in others, even when it is not present. For example, incarcerated men with a history of extreme violence tend to perceive social interactions as more threatening and hostile than other populations (Kret & de Gelder, 2013). Furthermore, violently inclined men demonstrated more inaccuracies in perceiving intentions and emotions when asked to ignore aggressive stimuli. Kret and de Gelder (2013) hypothesized that the hostile world view adopted by incarcerated men may form as a means of survival in prison and other violent settings (e.g., within gangs and crime-ridden neighborhoods). By allowing an individual to react more quickly to perceived threats, a hasty perception of violence can be an adaptive skill rather than an inherent flaw.

However, the effect of trait aggression was not limited to extremely violent men. Even students who reported higher levels of aggression were more likely to perceive aggression where it was not present (Hall, 2006). Hall (2006) observed
that undergraduates with higher levels of trait aggression perceived the world as more negative. These individuals inaccurately perceived negative emotions more often than individuals with lower levels of aggression. It seems that, if an individual was primed to see hostility in other people, then that individual may be more likely to perceive the world as hostile and violent. Essentially, individuals created a worldview that altered their expectation about the world and other people’s intentions, controlling their perception and interpretation of the world (Hall, 2006).

The previous studies may lend support to the locus of control theory of aggressive behavior, which states that individuals with an external locus of control will display significantly more physical, verbal, and indirect aggression (Österman et al., 1999). Locus of control refers to the degree in which individuals believe they have control of the situations in their lives (Österman et al., 1999). Essentially, individuals with a hostile perception of the world may attribute the cause of what happens in social situations to something out of their control. Thus, they may react more aggressively because they do not think they are responsible and attribute any blame to the other person (Hall, 2006).

Perceptions of Violence
Several researchers have looked at the effect of violent media on aggression and the perception of violence, but varied in the type of media used as the stimuli. In terms of print media, Kirsch and Olczak (2002a) examined the effects of reading two types of comic books on the perception of relational aggression (i.e., acts intended to harm an individual by harming a social relationship).

Kirsch and Olczak (2002a) found that participants who were assigned to read violent comic books perceived the provocateur’s mood and intentions as more hostile and recommended more retaliation than participants in the mild violence condition. The findings support the assumption that comic books may influence perception of social information similar to that of other media forms such as television or video games. More importantly, Kirsch and Olczak (2002a) argued that repeated exposure to violent comic books may increase the probability of long-term aggressive behavior. However, the authors did not look into the level of trait aggression prior to media exposure, which might have influenced the outcome.

In addition to measuring participants’ reactions to ambiguous fictional vignettes, other studies measured perceptions of violence from participants’ reactions to photographs of ambiguous facial expressions. Hall (2006) used photographs of facial expressions to research the relationship between an individual’s self-reported aggression and the perception of anger in other people. Hall (2006) found that individuals with a higher level of self-reported aggression were more likely to perceive aggression in nonaggressive facial expressions than individuals with lower self-reported aggression. Higher levels of reported aggression also correlated with a more external locus of control, which may link aggression to lower feelings of control in neutral social interactions. Furthermore, the Hall Resiliency Scale (Hall, 1998) showed that higher reported aggression negatively correlated with autonomy and initiation.

Hall’s (2006) research provided evidence for the idea that individuals with higher levels of trait aggression would perceive the world as more negative than less aggressive individuals. Because these individuals see anger and hostile intent where it is not present, their schema of the world as a hostile place is regularly reinforced and the effect is intensified.

Similarly to Hall (2006), Kret and de Gelder (2013) also utilized photographs to examine how violent male offenders perceive facial expressions and body postures. The experimental group consisted of 29 violent offenders from Dutch prisons based on their case history. The comparison group, similar in nationality and matched on age, included 31 men with various levels of education and employment but no criminal history. Four experiments were conducted in which participants were asked to match body postures to facial expressions and to identify the facial expressions of the subjects in the photographs. Kret and de Gelder (2013) found that the experimental group performed much slower than the control group in matching postures and expressions and consistently misidentified expressions (e.g., misclassifying fear as anger) more often than the control group. Kret and de Gelder (2013) demonstrated how men with a history of extreme violence perceive social interactions with difficulty and may help explain the perception of violence by violent individuals.

Rationale
Previous research has focused on trait aggression and perceptions of violence (e.g., Hall, 2006) and exposure to violence and perceptions of violence (e.g., Kirsch & Olczak, 2002a). The present study
extended the research to an understudied population that may be primed for aggression: athletes. Collegiate athletes are especially interesting because they spend much of their time engaging in behaviors that would be considered aggressive outside of practice or competition. Therefore, this particular population may be primed for more aggressive behaviors than other populations. It is possible that the aggression from competing may extend into their lives outside of the sport. The present study utilized a questionnaire with several vignettes to measure perceptions of violence (Kirsch and Olczak, 2002a). This questionnaire assessed participants’ perceptions of violence or nonviolence at that point in time, which provided information about their overall perceptions of violence outside of the experimental context. The present study assessed differences in the perception of violence between current athletes, former athletes, and nonathletes.

**Hypotheses**

It was hypothesized that participants who viewed violent media would rate ambiguous scenarios as more violent than participants who viewed nonviolent media. Furthermore, it was hypothesized that participants with higher levels of trait aggression would rate ambiguous scenarios as more violent than participants with lower levels of trait aggression. It was hypothesized that athletes (current and former) would rate ambiguous scenarios as more violent than nonathletes. It was hypothesized that neither two-way nor three-way interactions would be significant.

**Method**

**Participants**

Data were collected from 100 participants. Participants with incomplete forms and participants younger than 18 years of age were removed from the data set (n = 9). Thus, the sample consisted of 91 undergraduate students attending a small, Methodist-affiliated liberal arts college in the mid-Atlantic region of the United States. The sample included 26 men and 65 women; 27.5% were current college athletes (i.e., currently playing a college sport), 17.6% were former college athletes (i.e., no longer participating in a college sport but used to), and 54.9% were never college athletes (i.e., never played a college sport). Participants were African American (51.6%), European American (37.4%), Latino/a (2.2%), and Other (8.8%). The ages of participants ranged from 18 to 42 (M = 20.71, SD = 3.76). A convenience sampling method was used to gather participants because it was the most time-efficient means of obtaining the desired sample size. Participants were mainly recruited from psychology classes and kinesiology classes. All participants were either full-time or part-time students.

**Measures**

**Exposure to media.** Only media exposure was manipulated in the present study and was categorized into two levels: nonviolent and violent. Nonviolent media was defined as media that depicts actions or behaviors that do not cause harm to the individual and others around that individual (e.g., cooking video clip). Violent media was defined as media with themes of aggression and violence that portrays acts of aggression between two or more individuals (e.g., fighting video clip). In the present study, participants were randomly assigned to one of the two conditions, and there were two levels to this variable: violent (n = 49) versus nonviolent (n = 42).

**Trait aggression.** Aggression has been defined in several different ways because it can take so many different forms such as exclusion, name-calling, hitting, and even lethal assaults. In the present study, trait aggression was defined as the degree to which an individual, on average, performs behaviors with the intention of harming another individual. The Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) was used to measure trait aggression, and participants’ scores were continuous in nature. The BPAQ (Buss & Perry, 1992) is a 29-item self-report measure of aggressive behaviors that covers four subgroups of aggression: physical, verbal, anger, and hostility. Participants used a 7-point Likert-type scale from 1 (extremely uncharacteristic of me) to 7 (extremely characteristic of me). Questionnaire items include, “I get into fights a little more than the average person” and “I sometimes feel that people are laughing at me behind my back.” Higher scores on the aggression scale indicate a higher level of trait aggression present in an individual.

Ebesutani, Kim, and Young (2014) calculated a reliability estimate of .90 for a sample of 199 children and adolescents in Mississippi. Another study calculated the test-retest reliability of this questionnaire at .78 for a cross-sectional study of 492 undergraduate students in Iran (Samani, 2008). In the present study, the Cronbach’s α for the BPAQ was .89 (M = 88.99, SD = 24.68).

**Athletic status.** All participants completed a demographic questionnaire about their age,
gender, race/ethnicity, class rank, and history of collegiate athletic experience. Participants’ athletic status was determined based on responses to the following question: “Are you currently a college athlete?” To make it clear if they were currently participating in collegiate sports, participants were asked to circle one of the following responses: (a) “Yes, I currently play a college-level sport,” (b) “No, but I used to play a college-level sport,” or (c) “No, and I have never played a college-level sport.” There were three levels to this variable: current athlete (n = 25), former athlete (n = 16), and nonathlete (n = 50).

**Perceptions of violence.** The dependent variable was the perception of violence, defined as the degree to which an individual identifies a behavior as one with an intention to cause harm to another individual. The Relational Provocation Stories Task (RPST; Kirsh & Olczak, 2002b) is a measure of perceived violence that requires participants to read six hypothetical stories that describe fairly ambiguous, relationally aggressive events happening to a child (Kirsh & Olczak, 2002b). For example, in one scenario, a child plays catch with other kids on the playground, and one of the other children playing throws the ball, hitting the first child in the back with the ball. None of the stories state the gender of any of the characters involved or the intention of the provocateur. Participants were asked to rate the level of aggressive intent of the provocateur on a 4-point scale from 1 (no aggressive intent) to 4 (extremely aggressive intent). Higher scores on the provocation task indicate a higher degree of perceived violence. Participants’ scores were continuous in nature.

The RPST was derived from a larger scale, the Aggressive Provocation Questionnaire (O’Connor, Archer, & Wu, 2001), in which the Cronbach’s α was calculated for three subscales: Anger (α = .92), Frustration (α = .92), and Irritation (α = .93). In the present study, perhaps due to the shortened nature of the survey, the Cronbach’s α for the RPST was .67 (M = 12.28, SD = 3.43).

**Procedure**

The researchers obtained Wesley College Institutional Review Board approval (IRB#: 01272017-05) before starting the study and obtained approval again for amended procedures. Following the original procedures, the study was advertised via flyers around campus, and participants came to a specified classroom at 5:30 p.m. or 6:30 p.m. in a span of 2 weeks to complete the study. All participants completed and signed an informed consent form before partaking in the study. The informed consent form only contained a basic description of the study without any details about the purpose to protect against demand characteristics tainting participants’ responses on the provocation task. Once consent was obtained, participants completed a demographic questionnaire and the BPAQ before viewing the respective video clips.

Random assignment was completed by having participants pull pieces of paper with either a 1 (violent condition) or a 2 (nonviolent condition) out of a bag. Participants randomly assigned to the violent condition watched a 3-minute video clip with an extensive amount of violent themes (i.e., a fight scene from the movie Homeland; BestMovieClips, 2016). Participants randomly assigned to the nonviolent condition viewed a 3-minute video clip without any form of aggression present (i.e., a segment on a cooking show; Chilcott, 2013). Then, after viewing the clips, all participants completed the RPST, were informed of the definition of aggression (i.e., intentional harm to another individual; Anderson & Bushman, 2001), and told to rate the stories per their own perceptions of the provocateur’s intentions. No formal manipulation check was completed. Both groups watched the clip to ensure consistency in the study. The nonviolent condition during these sessions was led by a research assistant, and the violent condition was led by the primary researcher. To ensure procedural integrity, both the primary researcher and the research assistants followed a strict protocol written by the primary researcher.

After participants completed these questionnaires, they were debriefed about the true nature of the study. They then watched a humorous video clip, Baby Panda Wants to Play with Tired Zookeeper (Funny haha, 2017) and filled out an optional gift card raffle form while the primary researcher collected the data packets.

Because few participants were obtained with this method (n = 5), the procedures were amended. In the amended procedures, the researchers contacted different professors and obtained permission to conduct the study in their classrooms. The study was conducted in four psychology classrooms and two kinesiology classrooms at the aforementioned institution over a 2-week period. After receiving permission from professors, the classes were randomly assigned to either the violent or nonviolent condition to minimize disruption. Aside from the change of conducting the study in classes and
completing random assignment by class, the procedures remained the same. All research sessions conducted during classes were carried out by the primary researcher; no research assistants helped during these sessions. At the end of the data collection, raffle winners were randomly selected for a chance to win one of two $25 gift cards to Target, a discount store retailer based in the United States.

### Statistical Analysis
To compare group means to support or refute the hypotheses, the BPAQ (i.e., trait aggression) was coded using a median split into high (i.e., scores above the 50th cumulative percentile = 83.3 and above) and low (i.e., scores below the 50th cumulative percentile = 83.2 and below) groups. In the present study, there were two levels to the BPAQ (i.e., trait aggression): high (n = 45) versus low (n = 45). The correlation between the BPAQ and the RPST was .35, p = .001.

### Results
A 2 x 2 x 3 factorial Analysis of Variance was conducted on the sample of 91 participants to examine the effect of exposure to media (violent vs. nonviolent), trait aggression (high vs. low), and athletic status (current vs. former vs. nonathlete) on perceptions of violence (see Table 1 and Table 2).

With regard to the hypotheses, there was no statistically significant difference in provocation scores between participants in the violent media condition (M = 12.16, SD = 3.18) and participants in the nonviolent media condition (M = 12.12, SD = 3.19), F(1, 79) = 0.18, p = .675, ηp² = .002, power = .070. However, there were main effects for trait aggression and athletic status. Participants with higher levels of trait aggression (M = 13.36, SD = 2.98) had higher provocation scores than participants with lower levels of trait aggression (M = 10.96, SD = 2.91), F(1, 79) = 16.47, p ≤ .001, ηp² = .173, power = .980. In addition, there was a statistically significant difference in provocation scores among levels of athletic status, F(2, 79) = 4.88, p = .010, ηp² = .110, power = .789. A Tukey b post-hoc test with the Bonferroni adjustment for multiple comparisons revealed that there was no statistically significant difference between current athletes (M = 11.28, SD = 3.18) and nonathletes (M = 12.04, SD = 3.12), p = .805, as well as former athletes (M = 13.81, SD = 2.81) and nonathletes (M = 12.04, SD = 3.12), p = .088. However, former athletes (M = 13.81, SD = 2.81) were significantly more likely to have higher provocation scores than current athletes (M = 11.28, SD = 3.18), p = .017 (see Figure 1).

As predicted, no statistically significant two-way interactions were observed. Unexpectedly, there was a significant three-way interaction, F(2, 79) = 3.17, p = .047, ηp² = .074, power = .592. The main effects were subsumed by the three-way interaction. On one hand, nonathletes with high trait aggression in the violent media condition had higher provocation scores than nonathletes with low trait aggression in the violent media condition. On the other hand, current athletes with high trait aggression in the nonviolent media condition had higher provocation scores than current athletes with low trait aggression in the nonviolent condition.

### Table 1
Descriptive Statistics of Athletic Status, Exposure to Media, and Trait Aggression on RPST Scores

<table>
<thead>
<tr>
<th>Athletic Status</th>
<th>Exposure to Media</th>
<th>Trait Aggression</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Violent</td>
<td>Low</td>
<td>5</td>
<td>9.40</td>
<td>2.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>9</td>
<td>11.67</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>Nonviolent</td>
<td>Low</td>
<td>4</td>
<td>7.75</td>
<td>1.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>7</td>
<td>14.14</td>
<td>1.68</td>
</tr>
<tr>
<td>Former</td>
<td>Violent</td>
<td>Low</td>
<td>4</td>
<td>13.00</td>
<td>2.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>6</td>
<td>15.33</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>Nonviolent</td>
<td>Low</td>
<td>4</td>
<td>12.25</td>
<td>3.69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>2</td>
<td>14.00</td>
<td>2.83</td>
</tr>
<tr>
<td>Nonathlete</td>
<td>Violent</td>
<td>Low</td>
<td>15</td>
<td>10.60</td>
<td>2.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>10</td>
<td>14.10</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td>Nonviolent</td>
<td>Low</td>
<td>14</td>
<td>11.86</td>
<td>3.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>11</td>
<td>12.36</td>
<td>3.20</td>
</tr>
</tbody>
</table>

Note. RPST = Relational Provocation Stories Task.

### Table 2
Analysis of Variance Summary Table for Scores on the Relational Provocation Stories Task

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>ηp²</th>
<th>power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violent</td>
<td>12.16</td>
<td>3.18</td>
<td>1</td>
<td>0.18</td>
<td>.675</td>
<td>.002</td>
<td>.070</td>
</tr>
<tr>
<td>Nonviolent</td>
<td>12.12</td>
<td>3.19</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Aggression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>10.96</td>
<td>2.91</td>
<td>1</td>
<td>16.47</td>
<td>≤.001</td>
<td>.173</td>
<td>.980</td>
</tr>
<tr>
<td>High</td>
<td>13.36</td>
<td>2.98</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Athlete</td>
<td>11.28</td>
<td>3.18</td>
<td>2</td>
<td>4.88</td>
<td>.010</td>
<td>.110</td>
<td>.789</td>
</tr>
<tr>
<td>Former Athlete</td>
<td>13.81</td>
<td>2.81</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonathlete</td>
<td>12.04</td>
<td>3.12</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion
The present study assessed how exposure to media, trait aggression, and athletic status were related to the perceptions of violence. The hypothesis that individuals who have higher levels of trait aggression would immediately perceive more violence in the ambiguous stories was supported. Supporting findings from previous research (i.e., Hall, 2006; Kret & de Gelder, 2013), the present study provides evidence that individuals with a history of high trait aggression may be more likely to perceive violence in situations without explicit violence. These individuals have a tendency or proneness to be aggressive because they have adopted a hostile world view (Kret & de Gelder, 2013). Furthermore, quickly responding to possible aggressive acts may help individuals in violent situations survive. It is important in these situations to make quick judgments, which may lead to incorrectly perceiving violent situations. Therefore, individuals with higher levels of trait aggression might have developed the heightened trait aggression as a response to their surroundings, in which case it is safer for those individuals to incorrectly perceive violence and react first than to incorrectly perceive amity and experience negative consequences.

In contrast, the present study did not find that exposure to violence had an immediate effect on perceptions of violence. This is surprising given the premise of social learning theory (Bandura, 1973) and desensitization theory (Griffiths & Shuckford, 1989). Moreover, there was the expectation that priming individuals with violent content would lead to having more perceptions of violence. One possible explanation for this finding may be that there are differences in the immediate versus long-term effects of desensitization. Griffiths and Shuckford (1989) argued that desensitization arises when the stimuli being presented (e.g., the violent media) are no longer new and exciting. When individuals become desensitized to the stimuli, they experience decreased psychological and physiological arousal. The violence is gradually viewed as commonplace and normal, which in turn makes aggressive cognitions and behaviors the norm as well. In the present study, perhaps participants were desensitized to the stimuli, and because of the immediate nature of the ratings, they did not have enough time psychologically and physiologically to acclimate and, therefore, did not have higher perceptions of violence. They were desensitized and did not find any violent intent in the ambiguous scenarios.

The hypothesis that current and former athletes would immediately perceive more violence in the ambiguous stories than nonathletes was supported, as a main effect was found. This was initially hypothesized because any participation in sports, current or former, would increase perceptions of violence. This reasoning comes from social learning theory (Bandura, 1973), in which athletes, exposed to more competition, aggression, and violence in the sport, may be more likely to carry these perceptions in their daily lives outside of the sport. However, the results were surprising in that there were no differences in the perceptions of violence between current athletes and nonathletes. A main effect was indeed found but the difference lay between the perceptions of violence between current athletes and former athletes.

One possible explanation utilizes the catharsis hypothesis (Bushman, Baumeister, & Stack, 1999) with the premise that most athletes are primed for aggression through their sport. Whereas current athletes still participate in their respective sport, which may act as an outlet for any aggression (essentially directing aggression back into the game), former athletes do not have an outlet for that aggression. This may lead former athletes to have higher perceptions of violence. Another possible explanation is that current athletes may be able to differentiate between acts of aggression that are intended to harm the athlete (e.g., shoving another athlete to get the soccer ball) and behaviors that are simply part of aggressive playing (e.g., trying to get the soccer ball). Former athletes may no longer make this distinction effectively because they have been away from the sport, whereas current athletes are continually refining this distinction by playing.

![FIGURE 1](image-url)

Note: Error bars denote 95% confidence intervals. RPST = Relational Provocation Stories Task.
their sport. On the other hand, perhaps former athletes left the sport due to obtaining an injury of some kind. As a result, they may be hypervigilant in trying to prevent injury in the future. They might have also left a sport because it was too violent and they did not want to be injured. This may lend itself to the hostile word view, as postulated by Kret and de Gelder (2013). By allowing an individual to react more quickly to perceived threats (e.g., in this case, the possibility of having an injury), a hasty perception of violence can be an adaptive skill rather than an inherent flaw.

In the present study, there were no two-way interactions, but there was an unexpected three-way interaction. However, this interaction should be interpreted with caution. With this in mind, the groups with the highest perceptions of violence include former athletes with high trait aggression in both the violent and nonviolent conditions, current athletes with high trait aggression in the nonviolent condition, and nonathletes with high trait aggression in the violent condition. The findings for the former athletes were not surprising for reasons outlined above. For the current athletes, trait aggression accounts for higher perceptions of violence but the violent media appeared not to matter. It is interesting that no differences were found between current athletes with low trait aggression and current athletes with high trait aggression in the violent media condition. Perhaps there is a ceiling effect for perceptions of violence and athletes in which those with low trait aggression “catch up” with their high trait aggression peers when violence is present. However, current athletes with high trait aggression in the nonviolent condition displayed scores on the provocation task that were almost double that of current athletes with low trait aggression in the nonviolent condition.

A study by Coleman (1999) may provide a possible explanation for this finding in the nonathletes. Coleman (1999) studied the effects of video games driven by head-to-head fighting on state aggression in adolescents and found that participants with lower aggression scores on the pretest were most affected by the games. Adolescents who exhibited low scores on the competitiveness pretest experienced a significant increase in their competitiveness score after playing the game. Similarly, individuals with low pretest scores on the Aggression scale saw a significant increase in the Suspicion subscale score during the posttest. The results indicated that individuals with lower reported levels of aggression and competitiveness were more prone to adverse effects of violent video games than individuals with higher levels of aggression before game exposure. In the present study, for the nonathletes, trait aggression appears to account for higher perceptions of violence, but it seems that exposure to violent media may have a role. That is, the violent video clip may act as an amplifier, either triggering or further amplifying the individual for aggressive thoughts, feelings, and cognitions.

Limitations and Future Research

Exposure to media. The hypothesis that those who were exposed to violent media would immediately perceive more aggression was not supported. One explanation is that the video clip utilized in the present study was only 3 minutes long. A 3-minute clip was chosen to help minimize the time required to conduct the study as well as any loss of focus by participants. Perhaps if participants were exposed to violent media for a longer amount of time (e.g., the same duration as if reading a comic book per Kirsch and Olczak, 2002b), then the results could have differed. Thus, future investigations should replicate the present study and examine if dosage of stimuli (e.g., 5-minute video vs. 15-minute video vs. 30-minute video) has an effect on perceptions of violence. Future studies should also include a measure of participants’ ongoing exposure to or preference for violent media.

Another explanation for the nonsignificant results is that participants were exposed to the different media conditions by class. There may also be self-selection of participants into their classes. Although the psychology classes in the violent condition gasped and winced during the fight scene, the kinesiology classes (which included more current and former athletes) assigned to the violent condition actually cheered on the fight and laughed throughout the viewing. No other class displayed such a reaction while viewing the video clips. An interesting study would be to compare participants’ pre- and postmeasures of state aggression to see what effects, if any, violent media had on their perceptions of violence and to see if their self-selection of classes were a factor. When a Trait Aggression scale was reworded to generate a State Aggression scale, both measures were found to be reliable and were affected by exposure to violent media (Farrar & Krcmar, 2009).

In addition, the perception of violence in the violent video might have differed among participants depending on the aggressor to which they attended. For example, if they attended to the
bully, they might have perceived more violence in the scenarios than participants who attended to the defense against the bully. Future studies should consider the difference between justified aggression (e.g., defense against a bully) and unjustified aggression (e.g., an unprovoked attack by a bully).

Sample. The generalizability of the study is limited because the sample came from a small, Methodist-affiliated liberal arts college in the mid-Atlantic region of the United States. This sample should have included more athletes who currently play a sport because more than half of the sample in the current study was made up of individuals with no history of college-level athletics. In addition, the three-way interaction conducted in the present study used very few participants for some groups such as the current athletes in the nonviolent condition (n = 7 for high trait aggression; n = 4 for low trait aggression). In addition, the athletes who participated in the study were Division III athletes, so using participants from a Division I program or travel teams may exhibit a stronger effect because there are higher stakes in those sports teams.

The present study did not consider the association of the level of different activities and exposure to media or trait aggression. Future research can examine distinctions of whether the sports and non-sport activities participants engage in are important in terms of their relationship with trait aggression and exposure to media. A potential model of categorizing these variables can be found in Jordan’s (1999) study. First, noting the difference between individual sports (e.g., tennis, golf) and team sports (e.g., basketball, football) is important because there may be more interpersonal interaction in team sports. Second, the number of hours spent participating in their sport provides a measure of the students’ involvement and commitment to their training (e.g., 1 to 4 hours per week vs. 14 to 19 hours a week). To include extracurricular activities that may include vigorous activity (e.g., cheerleading, marching band), another model of categorizing variables can be found in Marsh & Kleitman’s (2002) study. They first outlined what types of activities students engaged in and then created five main predictor variables: number of school-sponsored extracurricular activities, time spent in school-sponsored extracurricular activities, total participation in school-sponsored extracurricular activities, structured out-of-school activities (e.g., karate lessons), and unstructured out-of-school activities (e.g., talking or doing things with friends).

General Conclusion

Although the present study only focused on an undergraduate population, it is still widely applicable because it expands upon current knowledge and takes the research in a new direction. The undergraduate population was chosen because it is not an especially violent population and it encompasses individuals from a variety of backgrounds. The present study demonstrated that trait aggression affects individuals’ perceptions of potentially violent, but ambiguous, situations.

References


According to the World Health Organization (2011), about 15% of people worldwide experience some form of disability including impairments, activity limitations, and participation restrictions. Psychological models of disability have historically focused on disability as a deficit to be overcome (see Schulz, 2009, for a review). However, psychologists have called for a shift toward a social model of disability, which emphasizes the role of society and the environment in defining and perpetuating disability (American Psychological Association, 2012; Olkin & Pledger, 2003). According to the social model of disability, the stigma experienced by those with a disability render them a socially marginalized group (Olkin & Pledger, 2003). Emerging adults’ experience of the social meaning of their disability is likely impacted by whether they claim disability status as part of their identity (Shakespeare, 1996). Research on young adults with disabilities has suggested that many do not self-identify as a person with a disability. Despite using recruitment materials mentioning disability, Nario-Redmond, Noel, and Fern (2013) found that 7 to 18% of their samples identified as “nondisabled or able-bodied.” Researchers using recruitment methods with no mention of disability found that
73% of emerging adults with a disability did not self-identify as “disabled” (Chalk, 2016). These data suggest that a substantial portion of emerging adults with a disability do not self-identify as a person with a disability, and therefore, are often excluded from disability research. The social meaning of disability is also likely related to participants’ level of positive disability identity, which refers to maintaining a positive view of oneself as a person with a disability (Bolton & Brookings, 1998). To assess positive disability identity in all emerging adults with a disability regardless of self-identification, we assessed disability variables in a sample of emerging adults recruited without priming the concept of disability.

Emerging adulthood is defined as the period between ages 18 and 25 when individuals do not fully identify as adults but feel as though they have reached some markers of adulthood (Arnett, 2000). This time frame is considered to be an influential individual growth period. However, social factors may influence some of this expression (Arnett, 2000). As Erikson (1968) outlined, establishing a sense of belonging is central for the psychosocial development of young adults. Although many definitions exist, a sense of belonging has been defined as a feeling that one is an integral part of a system or “experiencing a fit between one’s self and others around him/her” (p.173; Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992). Baumeister & Leary (1995) referred to belonging as having lasting, positive, and significant interpersonal relationships. Despite the importance of belonging for young adults, research has suggested that young adults with a disability experience barriers to feelings of belonging. Studies of emerging adults with a disability have suggested that most young adults with disabilities experienced rejection by peers during school (Chen & Shu, 2012; Salmon, 2013). Young adults with disabilities reported more feelings of social rejection and a lower sense of belonging than peers without a disability (Bramston, Bruggerman, & Pretty, 2002; Hall, 2004). Most psychology trainees with disabilities also reported experiencing disability-related discrimination during their professional training (Lund, Andrews, & Holt, 2013).

A low sense of belonging in emerging adults with a disability is concerning, because among emerging adults with no disability, one’s sense of belonging has been linked with positive psychological and physical outcomes (Begen & Turner-Cobb, 2015). In college undergraduates, a strong sense of belonging has been linked to academic motivation, self-efficacy, and improved mental health (Freeman, Anderman, & Jansen, 2007; Stebleton, Soria, & Huesman, 2014). Researchers have also identified potential negative effects of not belonging because social isolation predicted lower subjective well-being in emerging adults with a disability (Yurkevitch, Berslav, & Araten-Bergman, 2015). Given the positive outcomes associated with sense of belonging, it is important to investigate the variables that predict a sense of belonging in emerging adults with a disability.

Vaccaro, Daly-Cano, and Newman (2015) proposed a model of belonging for emerging adults with disabilities, which suggests that social relationships are important in developing a sense of belonging. Based on this model, it was expected that emerging adults with more social support would experience a greater sense of belonging. Some young adults with disabilities reported experiencing a sense of belonging with peers with disabilities, based on their shared experience of stigma (Salmon, 2013). However, social support from those outside the disability community seems to predict a sense of belonging as well. Secondary school students with disabilities who had more social support from teachers, coaches, and counselors reported a greater sense of belonging compared to peers (McMahon, Parnes, Keys, & Viola, 2008). In college students, participation in extracurricular activities such as campus sports, clubs/organizations, as well as faculty relationships significantly contributed to a sense of campus belonging for students with a disability (Doubt & McColl, 2003; Jones, Brown, Keys, & Salzer, 2015). College students identified having support from staff and fellow students as the primary resources for their success (Graham-Smith & Lafatette, 2004; O’Keeffe, 2013). In emerging adult women with disabilities, peer support groups have been effective for fostering a positive sense of belonging (Mejias, Gill, & Shpigelman, 2014). These findings all suggest that social support is positively related to a sense of belonging for emerging adults with disabilities.

Distinctive from the concept of sense of belonging, the need to belong refers to one’s need to form and maintain lasting, positive interpersonal relationships (Baumeister & Leary, 1995). No research has addressed the need to belong in emerging adults with disabilities specifically. However, some research on emerging adults suggests that the need to belong is associated with increased loneliness.
and poor health outcomes (Hartung & Renner, 2014). A strong need to belong in emerging adults has also been associated with low life satisfaction and a weaker sense of belonging (Pillow, Malone, & Hale, 2015). Similar patterns emerge in adults; a high need to belong has been linked to loneliness and poor relationship satisfaction (Mellor, Stokes, Firth, Hayashi, & Cummins, 2008). However, other studies with adults have found that one’s need to belong does not predict the frequency or severity of health outcomes (Knack, Iyer, & Jensen-Campbell, 2012). The inverse relationship between sense of belonging and need to belong in the literature suggests that the need to belong in emerging adults with disabilities will likely be related to a lower sense of belonging.

Although few studies exist in this area, patterns in the literature suggest that sense of belonging may be related to positive disability identity, or one’s positive sense of identity as a person with a disability (Bolton & Brookings, 1998). In a sample of women with varied disabilities including mobility, visual, intellectual, and speech impairments, those who reported more positive disability identity also experienced a greater sense of belonging (Meijas et al., 2014). A study of disability narratives suggested that having positive disability identity promotes a strong connection to the disability community (Dunn & Burcaw, 2013). These findings suggest that positive disability identity may be related to a stronger sense of belonging. However, the qualitative nature of the study precluded generalizing to all emerging adults with a disability. Conversely, one study found that sense of belonging could be associated with less positive disability identity because emerging adults with disabilities in this study derived their sense of belonging from shared disability-related difficulties (Ville, Crost, & Ravaud, 2003). Despite this discrepant finding, the majority of the literature, as well as theories of disability identity, suggest that positive disability identity should be related to an increased sense of belonging in emerging adults with disabilities.

The empirical literature examining the need to belong, the need to form lasting positive interpersonal relationships, is also limited. Baumeister and Leary (1995) proposed that those who have a high need to belong are more likely to emphasize the social aspects of their identities. This suggests that disability identity may be salient for emerging adults with disabilities who have a high need to belong. Unfortunately, the empirical research examining the need to belong in relation to positive disability identity is limited. However, because the need to belong is inversely related to one’s sense of belonging, it was anticipated that the two variables would have inverse relationships with positive disability identity.

The present study examined the link between sense of belonging, need to belong, social support, and positive disability identity in a sample of emerging adults with disabilities. Based on the link between social support and belonging in empirical investigations, we expected emerging adults who have high perceived social support to report a strong sense of belonging, regardless of whether or not they self-identified as a person with a disability (e.g., McMahon et al., 2008; Meijas et al., 2014). Consistent with social models of disability and Vacarro’s (2015) model of belonging for emerging adults with a disability, we anticipated that emerging adults who reported more positive disability identity would report a stronger sense of belonging and a lower need to belong. We expected that these relationships would differ for those who did not initially self-identify as a person with a disability because positive disability identity would likely be less salient for them. Because little research exists examining positive disability identity and sense of belonging and need to belong in emerging adults with a disability, we based our hypotheses on narrative studies suggesting that positive disability identity would predict a strong sense of belonging (e.g., Dunn & Burcaw, 2013; Meijas et al., 2014). We anticipated that this relationship would exist, even after accounting for the effects of perceived social support and need to belong. Furthermore, we expected this prediction to be stronger for those who self-identified as a person with a disability because positive disability identity is likely to be more salient for that group. The present study extended the existing literature by empirically examining whether positive disability identity would predict sense of belonging and need to belong in an emerging adult sample, recruited without priming for disability.

**Method**

Data were collected through a multicampus collaborative project examining emerging adulthood, *Emerging Adulthood Measures at Multiple Institutions 2* (EAMMI2, https://osf.io/te54b/).

**Participants**

Researchers at 32 colleges and universities recruited participants including 29 in the United States.
and one each in England, Greece, and Grenada. Each recruitment site received approval from the appropriate institutional review board, and all data collection followed APA ethical standards. Each of the 32 site investigators recruited a convenience sample via various methods including university classes, university participant pools, honor society chapters, e-mail, and social media. Emerging adults ages 18 to 25 were recruited to participate. Because some participants did not complete all items, listwise deletion was used to exclude any participant with missing data for an analysis.

The full EAMMIf2 sample included over 3,200 respondents. However, only participants with a disability and self-reported age from 18 to 25 (N= 502) were included in this study. The average age of respondents was 19.99 (SD = 1.78). Most participants identified as women (n = 382, 76.1%), with 103 (20.5%) identifying as men, and 17 (3.4%) identifying as “other.” Most participants (n = 325, 64.7%) identified as White/European American, with the remainder identifying as biracial (n = 62, 12.4%), Black/African American (n = 33, 6.6%), Hispanic/Latino (n = 31, 6.2%), Asian/Pacific Islander (n = 31, 6.2%), Native American/American Indian (n = 1, 0.2%), or other (n = 19, 3.8%). Most participants were currently in college (n = 450, 89.6%), with others having completed no college (n = 4, 0.8%), some college (n = 5, 1%), an associate’s degree (n = 18, 3.6%), a bachelor’s degree (n = 3, 0.6%), some graduate education (n = 16, 3.2%), or a graduate degree (n = 6, 1.2%).

Measures
Participants completed the following self-report measures online. Means, standard deviations, and Cronbach’s α for each scale are presented in Table 1 and Table 2. Participants also responded to questions about demographics.

Disability status. Two items were used to assess disability status. Participants completed one dichotomous item indicating whether or not they identify as a person with a disability. In a separate item, participants indicated whether or not they experience a disabling impairment in each of six categories (e.g., physical, sensory, learning, psychiatric, chronic health, or other). Participants responded “yes” or “no” to each category of disability, and therefore, they could indicate the presence of a disability in multiple areas. Similar items have been used by Bogart and colleagues (2017) because previous researchers have demonstrated that a portion of emerging adults with disabilities (ranging from 7 to 73%) do not self-identify as having a disability, and are therefore eliminated from most disability research (Chalk, 2016; Nario-Redmond et al., 2013).

Of participants, 156 (31.1%) self-identified as a person with a disability, and 346 did not self-identify as having a disability (68.9%). Participants indicated

---

**TABLE 1**

### Correlations in Participants Who Initially Self-Identify as Having a Disability

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Need to Belong</td>
<td>34.43</td>
<td>7.55</td>
<td>.82</td>
<td>-.20</td>
<td>-.01</td>
<td>.03</td>
<td>.08</td>
<td>-.17</td>
</tr>
<tr>
<td>2. Positive Disability Identity</td>
<td>29.74</td>
<td>8.41</td>
<td>.85</td>
<td>--</td>
<td>.39</td>
<td>.43</td>
<td>.20</td>
<td>.64</td>
</tr>
<tr>
<td>3. Social Support: Family</td>
<td>5.16</td>
<td>1.72</td>
<td>.92</td>
<td>--</td>
<td>.42</td>
<td>.20</td>
<td>.38</td>
<td></td>
</tr>
<tr>
<td>4. Social Support: Friends</td>
<td>5.23</td>
<td>1.43</td>
<td>.92</td>
<td>--</td>
<td>.36</td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Social Support: Special Person</td>
<td>5.45</td>
<td>1.76</td>
<td>.96</td>
<td>--</td>
<td>.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sense of Belonging</td>
<td>3.08</td>
<td>1.20</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05.* **p < .01. α represents Cronbach’s alpha for each scale, n = 156.

---

**TABLE 2**

### Correlations in Participants Who Did Not Initially Self-Identify as Having a Disability

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Need to Belong</td>
<td>33.61</td>
<td>7.76</td>
<td>.79</td>
<td>-.18</td>
<td>.08</td>
<td>.08</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>2. Positive Disability Identity</td>
<td>34.58</td>
<td>7.82</td>
<td>.82</td>
<td>--</td>
<td>.24</td>
<td>.27</td>
<td>.13</td>
<td>.34</td>
</tr>
<tr>
<td>3. Social Support: Family</td>
<td>5.23</td>
<td>1.55</td>
<td>.92</td>
<td>--</td>
<td>.34</td>
<td>.28</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>4. Social Support: Friends</td>
<td>5.45</td>
<td>1.32</td>
<td>.92</td>
<td>--</td>
<td>.48</td>
<td>.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Social Support: Special Person</td>
<td>5.51</td>
<td>1.72</td>
<td>.96</td>
<td>--</td>
<td>.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sense of Belonging</td>
<td>3.43</td>
<td>1.02</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05.* **p < .01. α represents Cronbach’s alpha for each scale, n = 346.
that they experience disabling impairments in several categories including psychiatric (n = 284, 56.5%), learning (n = 136, 27.1%), chronic health (n = 89, 17.7%), physical (n = 76, 15.1%), sensory (n = 76, 15.1%), or other (n = 14, 2.8%). Some participants (n = 123, 24.5%) indicated having a disability in multiple areas. A few (n = 8, 1.6%) indicated that they identify as a person with a disability but did not specify their type of disability. If participants indicated identifying as someone with a disability or endorsed a disability in a specific area, they were included in the sample.

Need to belong. The Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2013) was used to assess participants’ need to belong to a group. Respondents used a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) to rate the item, “I want other people to accept me” and “I have a strong need to belong.” Higher scores indicate a stronger need to belong. The Need to Belong Scale has demonstrated acceptable reliability in previous studies (α = .78 to .84 (Carvallo & Pelham, 2006; Mellor et al., 2008). Leary and colleagues (2013) conducted nine studies to demonstrate the construct validity of the scale.

Sense of belonging. Participant’s current sense of belonging was assessed with one item, based on the Belonging subscale of the Basic Social Needs Scale (Zadro, Williams, & Richardson, 2004). Participants used a 5-point Likert-type scale from 1 (not at all) to 5 (very much) to rate the item, “I feel like I belong.”

Social support. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) consists of three subscales with four items each. The three subscales assess participants’ perception of the social support they receive from family, friends, and a special person. Each subscale demonstrated acceptable reliability (see Tables 1 and 2). Participants used a 7-point Likert-type scale from 1 (very strongly disagree) to 7 (very strongly agree) to rate statements such as “My friends really try to help me” and “I can talk about my problems with my family.” Higher scores indicate more perceived social support. The MSPSS has demonstrated acceptable reliability in previous studies (α = .84 to .91; Civitci, 2015; Dahlem et al., 1991). The convergent validity of the MSPSS is demonstrated by positive correlations with measures of family and peer relations (r = .48 for family and .42 for peers; Osman, Lamis, Freedenthal, Gutierrez, & McNaughton-Cassill, 2014).

Positive disability identity. Positive disability identity, one’s positive sense of self as a person with a disability, was assessed using the Positive Identity subscale of the Personal Opinions Questionnaire (Bolton & Brooking, 1998). Participants used a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) to indicate their agreement with 11 statements addressing the degree to which they believe their disability enhances or harms their life. Although Bolton and Brooking (1998) used a dichotomous (yes/no) response format, the present study asked participants to rate their agreement with each statement on a 5-point Likert scale in order to capture increased variability in responses and attitudes toward disability. Higher scores indicate a more positive sense of oneself as a person with a disability. The Personal Opinions Questionnaire has demonstrated acceptable reliability (α = .85) and validity in adult samples (Bolton, 2001; Brookings & Bolton, 2000).

Because the data were collected across 32 sites, including small liberal arts colleges, large universities, and international institutions of higher education, differences likely exist across sites with respect to variables, which may influence sense of belonging and disability identity (e.g., cultural perception of disability, access to disability resources). To account for those differences, we created dummy variables to designate the site from which each participant was recruited. These dummy variables were used in regression analyses to account for the effects of the 32 different samples.

Results

Bivariate correlation coefficients were calculated to examine relationships between social support, sense of belonging, need to belong, and positive disability identity. The same pattern of correlations emerged in participants who self-identified as having a disability (see Table 1) and who did not self-identify but reported having a disabling impairment (see Table 2). As expected, those who perceived greater social support from family, friends, or a special person were more likely to report a strong sense of belonging. As anticipated, participants who reported a positive disability identity also reported
a stronger sense of belonging (i.e., feeling that they belong). Fisher r-to-z transformation revealed that the correlation between sense of belonging and positive disability identity was significantly greater for those who self-identified as having a disability, compared to those who did not self-identify but reported a disabling impairment (see Table 3). To test the hypothesis that positive disability identity predicts sense of belonging, over and above the effects of well-established predictors (i.e., social support and need to belong), we utilized a hierarchical regression. Because the data were collected across 32 sites, we controlled for the effects of sample. Dummy coded variables representing sample were entered in the first step to account for the differences across the 32 recruitment sites. Social support from family, friends, and a special person were entered in the second step. Need to belong was entered in the third step. Positive disability identity was entered in the fourth step. Analyses were conducted separately for those who self-identified as having a disability (see Table 4) and those who did not self-identify but reported having a disabling impairment in a specific area (see Table 5). For both groups, after controlling for the effects of social support and need to belong, positive disability identity significantly predicted sense of belonging. However, the effect sizes indicate that this prediction may be more practically meaningful for those who self-identify as having a disability ($R^2 = .12$, $p < .001$, Cohen’s $f^2 = .14$, see Table 4) than those who died not self-identify with their disability ($R^2 = .02$, $p = .002$, Cohen’s $f^2 = .02$, see Table 5).

**Discussion**

Emerging adults with greater perceived support from family, friends, or a special person experienced a stronger sense of belonging. This finding is consistent with previous investigations that social support relates to one’s sense of belonging (e.g., McMahon et al., 2008; Salmon, 2013). This relationship was consistent for those who did or did not initially self-identify as someone with a disability. For those in college, this may be a result of increased social support from campus organizations, sports teams, or faculty and staff (Graham-Smith & Lafatette, 2004; Jones et al., 2015; O’Keeffe, 2013).

After accounting for the effects of social support and need to belong, positive disability identity significantly predicted sense of belonging in emerging adults with a disability, particularly for those who self-identified as having a disability.
This finding is consistent with qualitative findings that positive disability identity is related to a strong sense of belonging or connection to one’s community (e.g., Dunn & Murcaw, 2013; Mejias et al., 2014). Our findings extend the literature by demonstrating that developing a positive disability identity, a favorable view of oneself as a person with a disability, is related to one’s sense of belonging in emerging adults with disabilities. It is possible that identifying with the disability community in a positive way might contribute to a sense of connection to others in that community. Having a positive disability identity may assist one in finding a place in the disability community, which could be related to an increased sense of belonging (Erikson, 1968; Longmore, 1995). Additionally, it may be that maintaining a positive disability identity combats the negative implications that society imposes on those with disabilities (Shakespeare, 1996).

Also consistent with hypotheses, emerging adults with a positive disability identity reported a lower need to belong, only if they self-identified as someone with a disability. Because those with a positive disability identity reported a stronger sense of belonging, they might have their interpersonal needs met by current relationships, which might lead them to report a lower need to belong.

Despite these important findings, the present study has several limitations. The most notable limitation is the use of a single item to assess sense of belonging. The constraints of the EAMMi2 collaboration limited the number of items that each researcher could add to the survey, preventing the inclusion of a more extensive belonging scale. Future research should use a validated scale such as the Belonging subscale of the Basic Social Needs Scale (Zadro et al., 2004). Despite the low variability in the single-item measure, our findings regarding belonging supported the hypotheses, suggesting that they warrant consideration. These findings should be considered as preliminary, within the context of additional research.

Additionally, given that the sample primarily consisted of college students, these findings likely represent the experience of emerging adults with more educational opportunity and may not generalize to other young adults. Given the advancement of disability services on college campuses, future studies should include an assessment of whether students are accessing and utilizing disability services because this may be associated with their sense of belonging and disability identity. Furthermore, most of the sample identified as White or European American, suggesting that these findings may not apply to people of color. This study should be replicated with emerging adults with more varied educational and racial backgrounds. Although the study included participants with a variety of disabilities, analyses were conducted on the entire sample to capture the disability experience across emerging adults with disabling impairments. This study may be replicated in samples with diverse disabilities to detect differences between groups. Furthermore, the present study did not distinguish between visible and invisible disabilities. Given that the visibility of one’s disability may be related to one’s sense of belonging, subsequent research should include items assessing disability visibility. Despite these limitations, this study presents an important empirical demonstration of the association of positive disability identity with increased sense of belonging and lower need to belong in emerging adults with a disability. The study replicates the direct relationship between social support and sense of belonging in this group.

Given that emerging adults with greater perceived support have a stronger sense of belonging, health practitioners should consider family sessions and support groups to foster social support. For those with a strong need to belong, positive disability identity and sense of belonging are low. Therefore, peer support groups may be particularly beneficial for this group. Health practitioners could consider forming support groups for young adults with similar disabilities to enhance their feelings of normalization and foster a sense of positive disability identity and belonging. One such program aims to create a safe place for female emerging adults with disabilities to share their experiences and discuss disability-related topics (Mejias et al., 2014). Emerging adult women who participate in this group reported more comfort discussing disability and an increased sense of belonging (Mejias et al., 2014). Because those who maintain a positive disability identity report a stronger sense of belonging, mental health practitioners should consider assessing clients’ disability identity and engaging in interventions to foster positive disability identity because some treatment protocols have demonstrated links with increased confidence and sense of belonging (Elderton, Clarke, Jones, & Stacey, 2014; Mejias, Gill, & Shpigelman, 2014).

Across disability type, emerging adults with greater perceived support and a more positive disability identity have a stronger sense of belonging and lower need to belong. Although no causal
conclusions can be drawn from this data, the positive association suggests that positive disability identity is a relevant variable to consider when attempting to foster a sense of belonging in emerging adults with a disability.

References

Salmon, N. (2013). ‘We just stick together’: How disabled teens negotiate stigma to create lasting friendship. *Journal of Intellectual Disability Research*, 57,


Author Note. Ashley Raver, Department of Psychology, McDaniel College, Westminster Maryland; Hanna Murchake, Department of Psychology, McDaniel College, Westminster Maryland; Holly M. Chalk, Department of Psychology, McDaniel College, Westminster Maryland.

The EAMMi2 data collection was partially funded by a Pacific Lutheran University Regency Award and a Teaching Fund Award from the Association for Psychological Sciences. Full funding information is available at https://osf.io/8dgaf/wiki/home/. Special thanks to Psi Chi Journal reviewers for their support.

This manuscript qualifies for an Open Materials badge and an Open Data badge; the materials and data are available at https://osf.io/aqkgt/. Data for this manuscript was obtained from the EAMMi2 collaborative project. Contributors to that project can be found at the Center for Open Science project page (https://osf.io/te54b/).

Correspondence concerning this article should be addressed to Holly M. Chalk, Department of Psychology, McDaniel College, 2 College Hill, Westminster MD 21157. E-mail: hchalk@mcdaniel.edu.
The common characteristics of college students have been changing, particularly over the past decade; in addition to an increase in older students and students who are also parents, the majority of students now also hold a job outside of school. According to the National Center for Education Statistics (NCES, 2012), 25.9% of college students work full time, 36.4% work part time, and only 37.7% reported not working while going to school. The American College Health Association (2015) reported that most students no longer live on campus, such that 40.4% live in off-campus housing and only 34.5% live on campus in residence halls. In addition to living off campus, many students also take online or distance classes in order to better balance their multiple roles; more specifically, 26.4% of college students and 30.8% of postbaccalureate students reported taking at least one distance education course (NCES, 2013). This shift from students primarily not working, living on campus, and taking in-person courses to the current demographics described has given rise to a large group of students who are balancing multiple roles.

Regardless of the reason a person elects to return to or begin schooling, research has demonstrated that transitioning to college often results in significant life changes such as elevated levels of stress and negative affect, declines in physical health (Gall, Evans, & Bellerose, 2000; Pritchard, Wilson, & Yamnitz, 2007), and a disruption in the balance of work, family, and school satisfaction. With many adults returning to college, an increasing number of university students are balancing multiple roles including work, family, and school. The impact of strain from balancing these multiple roles was investigated considering student satisfaction within different domains (i.e., work, family, and school) as a predictor of students’ negative affect in a sample of working college students from across the country (via MTurk; N = 145). Participants were required to be enrolled in a university or college at least part time, employed at least part time, and living with another person. Results revealed that social integration was negatively associated with negative affect across domains. Work satisfaction was predictive of negative affect, and it was also moderated by social integration, β = -.93, t(136) = 2.08, p = .04. School and family satisfaction, however, were not significant predictors of negative affect, thus suggesting the unique roles of each specific domain. This work suggests it is important to focus on the unique experiences of modern-day college students, and the challenges of balancing work, family, and school, in order to better support this rapidly growing unique group of individuals.
between the work, school, and family domains (Kohler Giancola, Grawitch, & Borchert, 2009; Lowe & Gayle, 2007; Quimby & O’Brien, 2006). Researchers have been interested in what happens when the levels of satisfaction in those domains vary and how that directly relates to negative affect. With this in mind, our goal was to examine how work, school, and family satisfaction might influence negative affect for a sample of college students balancing multiple roles. Additionally, extending previous research (Bolger & Eckenrode, 1991), the current study examined the possible effects of social integration on these relationships to determine how it might alleviate, or buffer, some of the negative affect these college students may experience due to balancing multiple domains.

**Defining Nontraditional Students**

The composition of students in higher education has shifted dramatically over the past few decades (NCES, 2015). Instead of universities being exclusively populated by traditional students (i.e., 18–22 year olds, entering college immediately after graduating high school, living on campus), there is now a significant presence of students who can be characterized as nontraditional along a variety of dimensions (Horn & Carroll, 1996). These characteristics include working in addition to attending school, delayed entrance into college, financial independence, and having children or other dependents. The NCES report highlighting changing trends in student enrollment explained that most often when defining nontraditional students, age is the key aspect that is examined. More specifically, many consider a nontraditional student as one who is over the age of 25 (NCES, 1996). However, this often fails to take into account the variability of students and the characteristics that may not be strongly related to age. For example, it is reasonable to suggest that a nontraditional student could be one who is 20 years old with children, in a committed relationship, working, and living off-campus.

Previous literature provides other definitions of nontraditional students. For example, Hammer, Grigsby, and Woods (1998) defined nontraditional students as those over the age of 22 and working, whereas Bye, Pushkar, and Conway (2007) only used an age cutoff of 28 as their defining characteristic. Another definition offered by Gilardi and Guglielmetti (2011) defined nontraditional students as those who had nonoccasional employment, whereas Taylor and House (2010) recruited nontraditional students based on whether the students had indicated that they considered themselves to be nontraditional on their enrollment forms. Arguably, individuals who are balancing multiple roles, irrespective of age, often have a different college experience than their traditional counterparts, which has a large impact on their persistence and success throughout their educational experience (Gilardi & Guglielmetti, 2011).

**Students Balancing Multiple Roles**

Working students’ multiple roles are not independent of each other, and their negotiation between the roles is of great importance (Meiners, 2017). As role theory suggests, there is an element of learning and socializing that happens when a person takes on a new role (Biddle, 1979; Kahn, Wolfe, Quinn, Snoek, & Rothenthal, 1964). Some students can have a difficult time negotiating a balance between their roles, but when they are successful, enrichment in one domain can carry over to benefit other domains (Meiners, 2017). However, a large portion of research suggested that, when conflict between roles arises, this may lead to increases in negative affect, due to the difficulty associated with bringing these roles back into equilibrium (Livingston & Judge, 2008; Williams & Alliger, 1994). Working students have been found to spend 59 to 71 hours per week fulfilling their work, school, and domestic responsibilities (Lowe & Gayle, 2007). This often results in increased levels of stress and, thus, increased levels of student attrition. As an example, public health nurses who were also part-time students reported high levels of negative affect when balancing many different roles, and when role demands were high, nurses who were also in school were less likely to spend time with their families compared to those who were not in school (Tak-Ying Shiu, 1999).

A hallmark of nontraditional students is a strong family member role that must exist alongside the student role. Many students have the role of caretaker because they are responsible for the care of other individuals such as children or older adult family members (see Fairchild, 2003; Shank, Winchell, & Myers, 2001). Often, those who have dependent children do not receive the support from others they require when returning to school. Lowe & Gayle (2007) reported that, among students who were also parents in their sample, two-thirds reported receiving no support from outside sources. It has also been found that, as the number of children participants were responsible for and the
number of credit hours the participants were taking increased, their level of family-school conflict significantly increased (Hammer et al., 1998). Alternatively, in other research, it was reported that those who returned to higher education indicated that the time they were able to spend with family was of a higher quality, and that they felt that they were setting a better example for their children (Kirby, Biever, Martinez, & Gómez, 2004). From previous research, it is evident that the influence of returning to school is complex, and it can have both positive and negative impacts on nontraditional students and their lives.

Work–Family–School Satisfaction

Well-established research has closely examined work, family, and to a lesser degree, school conflict and balance (e.g., Allen, Herst, Bruck, & Sutton, 2000; Byron, 2005; Frone, Russell, & Cooper, 1992). This research has focused on personal characteristics such as personality and demographics, as well as work and family dynamics. Interestingly enough, existing research has not focused on how satisfaction (which is linked to many positive and negative outcomes; Pavot & Diener, 2008) contributes to negative moods in students.

Work satisfaction involves employees’ attitudes and reactions toward their work, and encompasses many different aspects of the workers’ experiences (Bruck, Allen, & Spector, 2002). Results of a meta-analysis demonstrate a positive relationship between work satisfaction and mental and physical health outcomes (Faragher, Cass, & Cooper, 2005). More specifically, when employees reported lower levels of work satisfaction, they were far more likely to report higher levels of depression, anxiety, and burnout (Faragher et al., 2005). Judge and Larsen (2001) reported a number of studies that demonstrate an association between negative affect and work satisfaction (see Levin & Strokes, 1989; Necowitz & Roznowski, 1994; Watson & Slack, 1993). Faragher and colleagues (2005) explained that work satisfaction is a critical factor in employees’ health, which can directly translate to their success as students (see Hybertson, Hulme, Smith, & Holton, 1992). Moreover, when examining the impact work-life balance has on work and life satisfaction, Haar, Russo, Suine, and Ollier-Malaterre (2014) found that, across cultures, work-life balance was positively associated with both work and life satisfaction. This provides insight into students balancing multiple roles, because nontraditional students have to balance not only work and family, but also school. The impact of the added domain of school needs to be investigated further.

The influence of family on nontraditional students, or students balancing multiple roles, is less clear. Bean and Metzner (1985) argued that a key factor in nontraditional student attrition was family responsibilities. Furthermore, other literature has demonstrated that family support is key to academic success (Christenson, Rounds, & Gourney, 1992; Dennis, Phinney, & Chuateco, 2005; Palmer, Davis & Maramba, 2011; Strom & Savage, 2014). More specifically, Berkove (1979) found that husband support was important for student success, but interestingly, the women in their study reported little change in their domestic role, which increased stress levels. Furthermore, support provided by children and friends was positively related to nontraditional students being more satisfied in their student role (Kirk & Dorfman, 1983). Lin (2016) conducted a literature review on challenges that female college students face and indicated that support from family helped motivate female students and played an important role in their successes. Additionally, Adams, King, and King (1996) demonstrated that work and life satisfaction were significantly associated with work and family; explicitly, satisfaction levels were higher when family and work roles did not interfere with each other. In light of this research, it is important to understand how college students’ family satisfaction influences levels of distress, particularly in how satisfaction in one role influences negative affect.

School satisfaction among college students balancing multiple roles has also been overlooked in the research, particularly as a predictor variable. Most research has focused on predictors of school satisfaction in child and adolescent students (Lin, Yu, Lee, & Jin, 2014; López-Pérez & Fernández-Castilla, 2017). Research conducted in Taiwan found that peer support and teacher support were positive predictors of school satisfaction in adolescent-aged students (Lin et al., 2014). Also, peer support, teacher support, and self-efficacy were positive predictors of school satisfaction in adolescent-aged students, but school satisfaction was examined as an outcome rather than a predictor. Hammer and colleagues (1998) discussed the importance of school satisfaction by suggesting that increasing school satisfaction could reduce conflict outside of that domain (i.e., work, family). In sum, school satisfaction could be an important predictor variable for college students that, to our knowledge, no research has examined in this way.
Social Integration
Another important aspect of the student experience is the relationships that students balancing multiple roles form in each domain that can help them navigate their roles. Social integration, highly related to social support (Cohen, Underwood, & Gottlieb, 2000; Vaux, 1998), is the process by which a group of individuals bond and feel a sense of belongingness with each other (Blau, 1960; Cutrona & Russell, 1987). The definition of social integration also entails the quantity and structure of social relationships, which includes the frequency of interactions and the size of one’s network (Schwarzer, Bowler, & Cone, 2014). Social integration focuses more on an individual’s social network, differing from social support, which describes social relationships on an interpersonal level, entailing an “exchange of resources” between two people with the purpose of the interaction to support, or enhance, the welfare of the recipient of the support (Shumaker & Brownell, 1984).

Based on previous research, we posited that social integration can work as a buffer against stress and assist with coping, similar to what researchers have found in social support research.

Levels of social integration in college students can vary based on different characteristics of the university and of students. For example, Chapman and Pascarella (1983) found that students attending universities with more commuter students were less socially integrated, suggesting that students who spend less time on campus may struggle to integrate socially. Furthermore, students at 4-year colleges reported more social and academic integration than those at 2-year colleges (Chapman & Pascarella, 1983). Chapman and Pascarella (1983) also suggested that the needs of different types of students, including nontraditional students, can vary and demand different resources from the universities they attend. One meta-analysis was conducted examining examined social class differences and social integration (Rubin, 2012). In his meta-analysis, Rubin (2012) found that, irrespective of their year in school and whether they were women or men, working-class students were less integrated than middle-class students. It was posited that it is imperative working-class students be just as engaged and integrated into the educational process as their counterparts.

Social integration has a direct impact on students’ intentions to be persistent, their commitment to goals, and their eventual completion of school (Cabrera, Nora, & Castaneda, 1995).}

Not only does social integration predict persistence through school, but it can also predict re-enrollment of students who previously began college but did not complete their degrees (Bers & Smith, 1991). Although social integration has also been found to buffer stress in multiple studies (e.g., Kendler, Neale, Kessler, Health, & Eaves, 1992; Schwarzer et al., 2014), few have examined social integration as a buffer on stress specifically in a sample of students balancing multiple roles.

Hypotheses
Understanding the impact of domain-specific satisfaction on negative affect among students balancing multiple roles is imperative to support their academic success. Our goal was to understand how work, family, and school satisfaction impacts these students. Moreover, we examined how social integration moderated the satisfaction-negative affect association because social integration has been touted an important variable in academic success. Specifically, we hypothesized that work, family, and school satisfaction levels would have a direct impact on negative affect. Additionally, when satisfaction levels are low, across all domains, we predicted that levels of negative affect would increase. We also hypothesized that social integration would buffer the satisfaction-negative affect association, such that this relationship would be weaker when social integration was perceived as high rather than when social integration was perceived as low.

Method
This project is part of a larger study examining nontraditional students in college who are balancing multiple roles. For this study, we recruited individuals who lived with their children, an older adult family member who they are caring for, or an intimate partner. These relationships are different than being a roommate in a college dorm, specifically in the role that emotions and relationship functioning play (Sanford & Rowatt, 2004). Additionally, all participants were college students and were employed. To be sure that we had adequate power, we used G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to calculate power parameters. The five predictors being tested, and the residual variance, were entered into G*Power (1- R² of the full model) to obtain an assumed power level of .80, and we set the effect size at .15 (a moderate level). It was determined that, with an error probability = .05 and power error probability (1-β) = .80, we needed to have a sample size of 92 to be adequately
powered. Our sample was well above the sample size number.

**Participants**

Upon receiving institutional review board approval (IRB #: 930), 113 participants fulfilled the initial required parameters of this study. Participants’ average age was 30.80 years (SD = 8.36), with an age range of 19 to 54 years. We also included 32 participants who reported that they were single and lived alone or with a nonintimate partner. Upon further review, these participants met the initial criteria; more specifically, each of those individuals were living with and taking care of their children and/or an older person/family member. With this additional criteria added, the final sample was n = 145.

Additionally, 64% reported being full-time students, and 32% were half-time students. The average reported GPA was 3.55 (SD = 2.27). Fifty-six percent of participants had children, and 21% had older adult parents who lived with them. Seventy percent of participants reported being a woman, female, or feminine; 25% of participants reported being a man, male, or masculine; and 5% were gender nonconforming, genderqueer, or gender questioning. Twenty-six percent lived with a partner, 37% were married, and as previously mentioned, 32% reporting being single living alone or with a roommate, but indicated in other demographic questions that they actually lived with their children or older individuals who they care for. The study had one participant who chose not to indicate living situation. Most participants were White or European American (70%); 14% were Black or African American, and 10% reported Hispanic, Latino, or other Spanish origin.

**Procedure**

Participants were recruited via Mechanical Turk-Prime. Amazon’s Mechanical Turk, commonly known as MTurk, is an online database in which individuals wishing to participate in research (workers) choose from a vast array of studies created by researchers (requesters) in return for monetary compensation (Buhrmester, Kwang, & Gosling, 2011). Recent research has demonstrated that MTurk is a viable source of data; research shows little to no significant difference in results of participant data in comparison to traditional recruitment processes (Buhrmester et al., 2011; Crump, McDonnell, & Gureckis, 2013; Morgan, Desmarais, Mitchell, Simons-Rudolph, 2017; Paolacci, Chandler, & Iperitotis, 2010). Participants were invited to take a survey examining the lives of college students balancing multiple roles. The survey took approximately 17 minutes to complete, and participants were compensated $1 upon completion of the full survey. The final page of the survey instructed participants how to receive their compensation (via TurkPrime code), and this page displayed the primary investigator’s contact information in case they had any questions. All participants were from the United States and attended a wide array of colleges from across the United States.

**Measures**

**Work satisfaction.** The Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983) was used to assess work satisfaction. Three questions were asked such as “All in all, I am satisfied with my work.” Each item was rated on a scale from 1 (strongly disagree) to 5 (strongly agree). Cronbach’s α was .89, which

---

**TABLE 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Negative Affect</td>
<td>-.18*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Family Satisfaction</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. School Satisfaction</td>
<td>.18*</td>
<td>-.20*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Job Satisfaction</td>
<td></td>
<td>.13</td>
<td>-.14</td>
<td>.33**</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>6. Social Integration</td>
<td>.01</td>
<td></td>
<td>-.38*</td>
<td>.18</td>
<td>.13</td>
<td>.31**</td>
</tr>
<tr>
<td>M</td>
<td>30.81</td>
<td>1.93</td>
<td>3.39</td>
<td>3.78</td>
<td>3.15</td>
<td>3.00</td>
</tr>
<tr>
<td>SD</td>
<td>8.36</td>
<td>0.91</td>
<td>1.49</td>
<td>1.02</td>
<td>1.27</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .01.

**TABLE 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 β</th>
<th>Model 2 β</th>
<th>Model 3 β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.18*</td>
<td>-.19*</td>
<td>-.20*</td>
</tr>
<tr>
<td>Social Integration</td>
<td>-.39**</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Work Satisfaction</td>
<td>.04</td>
<td>.70*</td>
<td></td>
</tr>
<tr>
<td>Social Integration x Work</td>
<td></td>
<td></td>
<td>-.93*</td>
</tr>
</tbody>
</table>

Note. N=132. *p < .05. **p < .01. ***p < .001.
suggests good reliability.

**Family satisfaction.** The family satisfaction measure was a modified version of the Michigan Organizational Assessment Questionnaire (Cammann et al., 1983). Again, three questions were asked such as “In general, I like being with my family.” Each item was rated on a scale from 1 (strongly disagree) to 5 (strongly agree). Again, the internal consistency was good at \( \alpha = .92 \).

**School satisfaction.** Using a 6-question measure by Butler (2007), questions were asked regarding participants’ satisfaction with their university or college. Some of the questions included “This university meets my expectations” and “I enjoy being a student on this campus.” The rating scale was identical to the other two measures, with response options ranging from 1 (strongly disagree) to 5 (strongly agree). Additionally, the internal consistency was good at \( \alpha = .94 \).

**Social integration.** Four items were used to measure social integration from Cutrona and Russell’s Social Provision Scale (1987). Example items included “In the last week, there were people who enjoyed the same social activities I did” and “In the last week, I felt like I was part of a group of people who shared my attitudes and beliefs.” A 4-item rating scale was used with response options ranging from 1 (strongly disagree) to 4 (strongly agree). The internal consistency coefficient was .74, which is considered acceptable.

**Affect.** Participants were asked to rate their level of specific negative moods over the past 7 days, using items that were adapted from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants were asked to indicate how they felt using a 5-point Likert-type scale from 0 (not at all) to 4 (extremely). Additionally, the internal consistency coefficient was .87.

**Results**

As demonstrated in Table 1, bivariate correlations revealed that family satisfaction was negatively and significantly associated with negative affect, \( r^2 (136) = .03, p = .03 \). Social integration was also significantly associated with negative affect, \( r^2 (140) = .14, p < .001 \). We also found a relationship between our control variable, age, and negative affect, \( r^2 (142) = .03, p = .03 \), and school satisfaction, \( r^2 (135) = .03, p = .04 \).

Next, we conducted a series of multiple hierarchical regressions. In Step 1, the control variable (age) was entered into the model as a predictor of negative affect. In Step 2, social integration and one predictor variable (work, family, and school satisfaction) were also entered into the model to predict negative affect. In Step 3, we added the interaction term to investigate the possible moderating effects of social integration on the satisfaction-negative affect relationship. Of note, age was used as a control variable because research has demonstrated that age can be a predictor of mood (Charles, Reynolds, & Gatz, 2001). Moreover, we had a large age range, and age was significantly correlated with negative affect.

**Work Satisfaction**

A series of multiple hierarchical regressions were conducted to examine the direct effect of work satisfaction levels on negative affect. Additionally, we examined whether social integration would buffer the work satisfaction-negative affect association. In Model 1, our control variable, age, accounted for 2.5% of variance in negative mood, as indicated by the \( R^2 \) value. In Model 2, we found no significant main effect for work satisfaction (\( \beta = .004, p = .96 \)), but did find a significant main effect for social integration (\( \beta = -.39, p < .001 \), see Table 2. In Model 3, we found a significant main effect for work satisfaction (\( \beta = .70, p = .045 \)), but no longer found a main effect for social integration (\( \beta = .02, p = .92 \)). Additionally, there was a significant interaction between work satisfaction and social integration on negative affect, suggesting that being socially integrated buffered these individuals, \( \beta = -.93, t(136) = -2.08, p = .04 \) (see Figure 1). A moderate amount of variance was explained in either model;

![FIGURE 1](image-url)

Negative affect is displayed at low, medium, and high levels of work satisfaction and social integration.
specifically, 19% of the variance was accounted for in the second model, and 21% of the variance was explained in the third model (Table 3). This hypothesis was supported.

**School Satisfaction**

Unlike work satisfaction, we found that school satisfaction had no significant main effects with mood in Model 2 ($\beta = -.12, p = .15$) or Model 3 ($\beta = -.12, p = .73$). However, social integration did have a significant main effect in Model 2 ($\beta = -.38, p < .001$), but not in Model 3 ($\beta = -.38, p = .20$). Additionally, the moderating effect of social integration on the school satisfaction-affect relationship was not significant ($\beta = .01, p = .99$). Although there were no significant main effects, the model did account for 18% of the variance in negative moods. See Table 4 and Table 5 for more information.

### Table 3

<table>
<thead>
<tr>
<th></th>
<th>Work Satisfaction and Social Integration Predicting Negative Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F$</td>
</tr>
<tr>
<td>Model 1</td>
<td>4.48</td>
</tr>
<tr>
<td>Model 2</td>
<td>10.14**</td>
</tr>
<tr>
<td>Model 3</td>
<td>8.87**</td>
</tr>
</tbody>
</table>

Note. "$p < .05.$" $p < .01.$" $p < .001.$

### Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 $\beta$</th>
<th>Model 2 $\beta$</th>
<th>Model 3 $\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.18</td>
<td>-.17</td>
<td>-.17</td>
</tr>
<tr>
<td>Social Integration</td>
<td>-.38**</td>
<td>-.38</td>
<td></td>
</tr>
<tr>
<td>School Satisfaction</td>
<td>-.12</td>
<td>-.12</td>
<td></td>
</tr>
<tr>
<td>Social Integration x School Satisfaction</td>
<td></td>
<td>.01</td>
<td></td>
</tr>
</tbody>
</table>


### Table 5

<table>
<thead>
<tr>
<th></th>
<th>School Satisfaction and Social Integration Predicting Negative Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F$</td>
</tr>
<tr>
<td>Model 1</td>
<td>4.49</td>
</tr>
<tr>
<td>Model 2</td>
<td>10.99***</td>
</tr>
<tr>
<td>Model 3</td>
<td>8.18**</td>
</tr>
</tbody>
</table>

Note. "$p < .05.$" $p < .01.$" $p < .001.$

**Family Satisfaction**

Again, we ran multiple hierarchical regressions to examine our hypothesis of whether there would be a direct effect of family satisfaction on negative moods and whether social integration would moderate the family satisfaction-negative affect relationship. This hypothesis was not supported; specifically, we found that family satisfaction did not significantly predict negative affect in either Model 2 ($\beta = -.11, p = .18$) or Model 3 ($\beta = .58, p = .10$). Additionally, no significant moderating effect was found, $\beta = -.83, t(136) = -2.02, p = .046$. The overall model summary for Model 3 was significant, $F(4, 132) = 4.06, p = .046, R^2 = .22, R^2_{adj} = .20$ (see Table 6 and Table 7 for each model).

### Discussion

This study aimed to investigate the relationship between students’ negative affect, social integration, and satisfaction with the life domains of work, family, and school. Previous research has focused on satisfaction as an outcome rather than as a predictor. However, we explored these relationships from the perspective of satisfaction being predictive of negative affect. Additionally, we predicted that social integration would moderate the satisfaction-negative affect association. Our results demonstrated that the different types of domain-specific satisfaction had unique relationships with negative affect.

**Work Satisfaction and Negative Affect**

Our results revealed that work satisfaction had a significant main effect on negative affect with the presence of an interaction with social integration. This may be due to the unique impact of work-family-school conflict on these students, who have many different roles and may not be able to offer enough time and effort to each role, resulting in interpersonal conflicts at work. More specifically, not being fully focused on the work may result in conflicts with coworkers and supervisors, and possibly pose the threat of work insecurity (Raeve, Jansen, Brandt, Vasse, & Kant, 2008). Although these individuals are choosing to take on the extra role as a student, their role strain may be affecting their coworkers because they have additional work and responsibilities. In turn, this could result in negative feelings (e.g., irritation) from their coworkers and vice versa.

Moreover, those who work and go to school may also feel that they are not receiving enough support from their employers, resulting in higher
levels of negative affect. It is possible that students who balance multiple roles maintain jobs that they do not see as permanent. Instead, they may see these jobs as required, temporary, and transitional (Olson, 2011; Staff & Mortimer, 2008). However, our results demonstrate that, if these individuals are socially integrated, there is a buffering effect on the work satisfaction-negative affect relationship. This is congruent with work by Adams and colleagues (1996), who found that higher levels of emotional and instrumental support reduced negative work issues. It is reasonable to suggest that being more socially integrated affords an individual a higher level of emotional and instrumental support.

Because this was the only specific type of satisfaction that had significant effects on negative mood, it appears to serve a unique role in the lives of students balancing multiple roles. Finding ways to increase work satisfaction for students balancing multiple roles could have the potential to impact their negative affect. Negative affect, including specific negative moods, has been shown to predict health outcomes (Cacioppo, Hawkley, & Thisted, 2011; Mayer-Hirshfeld et al., 2017), where lower levels of negative affect and specific negative moods (e.g., loneliness, anger, and feeling ashamed) predict better psychological and physical health outcomes including decreased depressive symptoms and decreased musculoskeletal pain. This suggests that reducing negative affect in students balancing multiple roles has the potential to reduce negative health outcomes.

School Satisfaction and Negative Affect

We did not find that school satisfaction was associated with negative affect. Although virtually no research has examined this association, we were surprised by these results. It is possible that we might have obtained different results if participants had been probed about aspects of depression or other mood disorders because they are often related to negative moods. Future research should consider the use of measures of mood disorders to better control for this possibility. Our average reported GPA was 3.55 (SD = 2.27), indicating that these students were performing well academically. This is consistent with findings that older students earn higher GPAs than their traditional counterparts (Richardson, Abraham, & Bond, 2012). This may indicate that they did not feel as negatively about school. Consequently, they might have not had much variability in their moods. Consistent with previous research, these students may work hard at self-regulating (Artino & Stephen, 2009; Zimmerman, 1994) when at school because it is a role that they hold in high regards. Also, they were likely to be highly motivated to attend school, as adults returning to school often are (Boekaerts, Pintrich, & Zeidner, 2000).

Family Satisfaction and Negative Affect

Our results did not reveal a significant main effect between family satisfaction and negative affect. Although family may potentially serve a protective role, it is also possible that caring for family can lead to additional stress. More research should consider the nuances of the role of family on students balancing multiple roles and consider possible moderators to the family satisfaction-negative affect relationship such as differences based on whom a student is responsible to care for (e.g., children, older adult family members). To our knowledge, very few studies have examined students who balance multiple roles and the effects of family satisfaction on negative affect. Additionally, more research should consider how each domain interacts with each other because this could have a compounding or buffering effect on the other domains. This suggests the importance of increasing the understanding of the unique role

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 β</th>
<th>Model 2 β</th>
<th>Model 3 β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.18</td>
<td>-.18</td>
<td>-.17</td>
</tr>
<tr>
<td>Social Integration</td>
<td>-.37</td>
<td>-.04</td>
<td></td>
</tr>
<tr>
<td>Family Satisfaction</td>
<td>-.11</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Social Integration x Family Satisfaction</td>
<td>-.83</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 132. *p < .05. **p < .01. ***p < .001.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 F</th>
<th>Model 1 R²</th>
<th>Model 1 Adjusted R²</th>
<th>Model 2 SE</th>
<th>Model 2 R²Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>4.48</td>
<td>.032</td>
<td>.025</td>
<td>.91</td>
<td>.032</td>
</tr>
<tr>
<td>Model 2</td>
<td>10.88**</td>
<td>.197</td>
<td>.179</td>
<td>.83</td>
<td>.197***</td>
</tr>
<tr>
<td>Model 3</td>
<td>9.36**</td>
<td>.221</td>
<td>.197</td>
<td>.82</td>
<td>.024</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .01. ***p < .001.
of family support for students balancing multiple roles (Lowe & Gayle, 2007).

Social Integration
We found that social integration moderated the work satisfaction-affect association, and additionally found significant main effects of social integration on negative moods in each domain-specific model. Previous research by Chao and Good (2004) suggested that two central concepts that kept nontraditional college students feeling hopeful were family support and integration. Much of the research on social integration in students has focused on integration in the school domain, measuring things like contact with faculty and involvement in organized extracurricular activities, or captured social integration using only a single-item measure (Chapman & Pascarella, 1983; D’Amico, Dika, Elling, Algozzine, & Ginn, 2013). One limitation to this study is that social integration was measured globally, not in reference to specific domains. Future research on students balancing multiple roles should consider social integration within different domains to better understand the relationship between work, family, and school. Social integration has been shown to have a direct effect on students’ persistence through higher education (Bers & Smith, 1991; Cabrera et al., 1993). Thus, universities have the opportunity to better support students balancing multiple roles through encouraging greater social integration.

Strengths, Limitations, and Future Research
A strength of our study was that all participants lived with a partner, had children, lived with an older adult family member, or had some other personal relationship with the person they lived with. Thus, we expanded past the conceptualization of “nontraditional” students as students over a certain age cutoff, and captured students balancing work, family, and school. Specifically, in our sample, 56% of participants had children who lived with them. It is possible that children have an influence on levels of negative emotions and moods for college students who are also parents. Particularly, Van Rhijn, Smit Quosai, and Lero (2011) explained that students who are also parents bear additional challenges than students without children. These challenges add to the strain that students who are also parents experience (Home, 1997).

In addition to being responsible for the care of children, an increasing number of workers and students are also caregivers for an older adult family member (National Alliance for Caregiving & AARP, 2015). Another strength of this study is that 21.4% of our participants reported having an older adult family member living with them, and of those, 48.4% indicated being their primary caretaker, with an additional 22.6% indicating that they are sometimes responsible for the care of their older adult family member. Although this is a small subset of our larger sample, more research needs to be conducted to understand how to better identify the unique challenges students caring for aging family members experience, and how this impacts their satisfaction and role conflict. In a report by the National Alliance for Caregiving and AARP Public Policy Institute (2015), it was described that, in the United States, an estimated 43.5 million adults provided unpaid care to an older adult family member in the past year, and 56% of these caregivers reported also working full time in addition to caring for their family member. Additionally, there is also a greater risk of financial, physical, and emotional strain reported by caregivers (National Alliance for Caregiving & AARP, 2015). Future research should consider the influence caregiving has on role strain and satisfaction in students balancing multiple roles, and college students in general.

A possible future consideration is accounting for the influence of culture on the satisfaction of college students. Oishi, Diener, Lucas, and Suh (1999) found that differing values in cultures around the world cause the predictors of life satisfaction to vary across cultures. Within college student populations, cultural differences also have an influence on satisfaction. For example, English may not be a first language for some, religious events can interfere with classes and studying, and being the first in a family to go to college comes with unique challenges (Ishitani, 2003). Future research should take cultural differences into account when considering college student satisfaction and stress levels because there are clear cultural influences.

A possible limitation of our sample is that data were collected via an online survey service, TurkPrime, an add-on to Amazon’s Mechanical Turk, which lacks the ability to authenticate demographic data (Paolacci et al., 2010). Although we could verify that all participants were college students, we did not examine whether they were enrolled at a 2-year or 4-year college or verify that they were living with another individual. It is possible that the results may be different depending on the type of school that the student is attending (Chapman & Pascarella, 1983). Although the type...
of school may influence social integration, Allen, Bourhis, Burrell, and Mabry (2002) conducted a meta-analysis and found only a small decrease in satisfaction in students in distance learning programs, compared to those in traditional colleges, but overall their satisfaction levels were very similar. Future research may want to examine the needs and differences specific to the types of colleges and universities.

It is also important to note that our control variable, age, was significantly related to negative mood, and did account for a small amount of variance in the model overall. Also, although only a small to moderate amount of variance was accounted for by our models, we believe that it is likely that these models are psychologically complicated and, even if there is a small change in variance, it is still important. Although we do not have many variables in our models, it is possible that they are still complicated—our sample is complex, and understanding satisfaction in each domain is riddled with complications as well. It is possible that there could be a suppression effect responsible for the significant omnibus tests for the models, without the predictors accounting for a significant amount of variance on their own.

**Conclusion**
This study focused on the importance of domain-specific satisfaction, and the effect it has on levels of negative affect among students balancing multiple roles. It is important to consider satisfaction in students because higher levels of satisfaction result in many positive outcomes (Pavot & Diener, 2008). Work satisfaction specifically is related to better physical and emotional health outcomes and lower stress levels (Bruck et al., 2002; Faragher et al., 2005; Hybertson et al., 1992). Social integration is also important to students, as it has been shown to buffer stress (Kendler et al., 1992; Schwarzer et al., 2014). It is important to note that we found moderating effects from social integration to the satisfaction-negative affect association with the domain of work, but not family and school. This reveals the complexities of this diverse and growing population of students; the large variation of characteristics and multiple roles that make students nontraditional also influence their level of social integration in specific domains. Future work should include a more diverse sample and a larger sample size.

Ultimately, our results suggest the importance of social integration for students balancing multiple roles. It is important to consider that these are results of a cross-sectional study. Thus, we cannot truly test whether satisfaction is a predictor or outcome, but we can establish a relationship between work satisfaction and negative affect in this particular subset of students. Students balancing multiple roles who are more socially integrated report lower levels of negative moods, which has important implications for better adapting higher education for students balancing multiple roles. Future interventions that target assisting students balancing multiple roles should focus specifically on assisting with the social integration process for these students in their workplaces. The significant moderating effect of social integration on the satisfaction-negative affect relationship in the work domain specifically highlights the importance of both satisfaction in the workplace and of increasing social integration into the workplace. Students balancing multiple roles may feel they do not have as much in common with their coworkers who are not also in school, thus hindering their social integration. Employers of students balancing multiple roles should also consider this because they should aim to support their social integration into the workplace further. Additionally, it seems that the role of work satisfaction may play a key role in predicting negative affect. Often many adult students may be driven to return to school due to a lack of satisfaction in their work situation (Kasworm, 2003), and it seems that being more satisfied in their work may buffer against some of the stresses of balancing multiple roles, and ultimately help reduce negative affect.

Although the prevalence of students balancing multiple roles in colleges and universities may be increasing (NCES, 2015), they still are overlooked in research. With changing demands from the workforce (National Institute for Occupational Safety and Health, 2002; Olson, 2011; Tausig-Fenwick, Sauter, Murphy, & Graif, 2004), and an increasing number of adults returning to college (NCES, 2015), it is crucial that more research be conducted in order to better understand and serve students in college who are balancing multiple roles. This study expanded upon previous research by modifying the typical definition used to describe students returning to school and examining the various roles they balance.

**References**
http://doi.org/10.1037/0021-9010.81.4.411
Satisfaction and Affect in Working College Students


Author Note. Emily C. Denning, Department of Psychology, Portland State University; Debi Brannan, Department of Psychology, Western Oregon University; Lauren A. Murphy, Department of Physical Therapy, Movement and Rehabilitation Sciences, Northeastern University; Josephina A. Losco, Department of Psychology, Western Oregon University; Danielle N. Payne, Department of Speech and Hearing Sciences, University of Washington.

Thank you to the Psi Chi editors and reviewers for their feedback and support. A special thank you to Kevin Gates, Mycah Harrold, and Chris Denning for proofreading the manuscript.

This manuscript qualifies for an Open Materials badge and an Open Data badge; the materials and data are available at https://osf.io/2jme8/
Correspondence concerning this article should be addressed to Emily Denning, Department of Psychology, Portland State University, Portland, OR 97201. E-mail: edenning@pdx.edu
"MY JOB IS NOT JUST TO TEACH, BUT ALSO TO HELP STUDENTS SEE THEIR INNER STRENGTHS."

At the College of Clinical Psychology at Argosy University, we believe in a practitioner-scholar model of training. Our programs offer a rigorous curriculum grounded in theory and research, while also offering real-world experience. What’s more, all our PsyD programs have received accreditation from the American Psychological Association (APA), certifying that they meet the industry’s standards.

Learn more at clinical.argosy.edu/psichi

Arizona School of Professional Psychology at Argosy University
American School of Professional Psychology at Argosy University | Southern California
American School of Professional Psychology at Argosy University | San Francisco Bay Area
Florida School of Professional Psychology at Argosy University
Georgia School of Professional Psychology at Argosy University
Hawaiʻi School of Professional Psychology at Argosy University
Illinois School of Professional Psychology at Argosy University | Chicago
Illinois School of Professional Psychology at Argosy University | Schaumburg
Minnesota School of Professional Psychology at Argosy University
American School of Professional Psychology at Argosy University | Northern Virginia

DR. NAHID AZIZ
Associate Professor at the American School of Professional Psychology at Argosy University | Northern Virginia
Dr. Aziz is committed to mentorship, training, and addressing issues relevant to the ethnic and racial diversity.

*The Doctor of Psychology in Clinical Psychology Program at Argosy University, Atlanta, Chicago, Hawaii, Orange County, Phoenix, San Francisco Bay Area, Schaumburg, Tampa, Tempe Citrus and Northern Virginia is accredited by the Commission on Accreditation of the American Psychological Association (APA). Questions related to the program’s accredited status should be directed to the Commission on Accreditation: Office of Program Consultation and Accreditation, American Psychological Association, 750 First Street, NE, Washington DC 20002; Phone: (202) 336-5979 / E-mail: apaccred@apa.org / Web: www.apa.org/ed/accreditation

Argosy University is accredited by the WASC Senior College and University Commission (986 Atlantic Ave., Suite 100, Alameda, CA 94501, www.wasc.org). Programs, credential levels, technology, and scheduling options are subject to change. Not all online programs are available to residents of all U.S. states. Administrative offices: Argosy University, 601 South Lewis Street, Orange, CA 92868 ©2018 Argosy University. All rights reserved. Our email address is materialsreview@argosy.edu
Find your career.
Eight graduate degree programs and four certificates in Educational Psychology

PhD in Educational Psychology
Engage in the science of learning. Prepare for a career where you can use your knowledge of human learning and development to help shape the school environment and public policy. Core program areas include learning, motivation, and research design.

MS or MA in Educational Psychology*
Broaden your ability to apply psychological principles to a variety of professional contexts or prepare for your future doctorate in social science.

MS in Quantitative Psychology*
Do you like numbers, statistics, and social science? Prepare for a career in research, assessment, and data analysis. Develop proficiency in advanced statistical techniques, measurement theory, and data analytics.

PhD in School Psychology (five-year program)
Prepare for a career as a licensed psychologist. Gain competencies in health service psychology to work in schools, private practice, or hospital settings. Accredited by the American Psychological Association (APA)** and approved by the National Association of School Psychologists (NASP). Scientist-practitioner model with advocacy elements. Specializations available.

MA/EdS in School Psychology (three-year program)
Be immersed in community engaged, real-world field experiences and intervention opportunities in our scientist-practitioner-advocate program. Leads to licensure as a school psychologist. Approved by NASP and the National Council for Accreditation of Teacher Education (NCATE).

MA in School Counseling (two-year program)
Be a leader and advocate for educational equity for all students in PK-12 schools. Leads to licensure as a school counselor. Accredited by the Council for

Accreditation of Counseling and Related Educational Programs (CACREP) and nationally recognized by The Education Trust as a Transforming School Counseling program.

Certificates
High Ability/Gifted Studies,* Human Development and Learning,* Identity and Leadership Development for Counselors,* Neuropsychology*

Graduate assistantships and tuition waivers are available.

bsu.edu/edpsy

*Online programs are available.
**Questions related to the PhD in school psychology’s accreditation status should be directed to the Office of Program Consultation and Accreditation, American Psychological Association, 750 First St. NE, Washington, D.C. 20002; (202) 336-5979; apaaccred@apa.org; or apa.org/ed/accreditation.
Call for Submissions

This summer, consider submitting research to *Psi Chi Journal* that is related to help-seeking behavior. Psi Chi is launching a new 2018 initiative, which will establish a toolkit of resources that encourage people to feel comfortable seeking help concerning a mental illness, bullying, sexual harassment/abuse, tutoring, test taking, etc.

Will you support the [#Help_HelpedMe Initiative](https://doi.org/10.24839/2325-7342.JN23.1.2) by helping us expand Psi Chi’s collection of help-seeking articles? As always, student and faculty authors are welcome, and submissions will remain open for all other areas of psychological research.

Experience our rigorous, yet supportive and educational, peer-review process for yourself. Our high visibility across the field and dedication to transparent, replicable research practices makes our journal the place to submit your research today!

Learn more about the Help_HelpedMe Initiative at https://doi.org/10.24839/2325-7342.JN23.1.2

“What if we lived in a world where seeking help was considered as noble as offering help? . . . Let’s work together toward a future where seeking help is universally perceived as a psychological strength.”

R. Eric Landrum, PhD
Psi Chi President

---

Gain Valuable Research Experience With Psi Chi!

Students and faculty are invited to visit Psi Chi’s free Conducting Research online resource at [www.psichi.org/?page=ConductingResearch](http://www.psichi.org/?page=ConductingResearch). Here are three ways to get involved:

**Join a Collaborative Research Project**


With Psi Chi’s Network for International Collaborative Exchange (NICE), you can join the CROWD and answer a common research question with various researchers both internationally, and nationally. You can also CONNECT with a network of researchers open to collaboration.

**Recruit Online Participants for Your Studies**

[www.psichi.org/?page=study_links](https://www.psichi.org/?page=study_links)

Psi Chi is dedicated to helping members find participants to their online research studies. Submit a title and a brief description of your online studies to our Post a Study Tool. We regularly encourage our members to participate in all listed studies.

**Explore Our Research Measures Database**

[www.psichi.org/?page=researchlinksdesc](https://www.psichi.org/?page=researchlinksdesc)

This database links to various websites featuring research measures, tools, and instruments. You can search for relevant materials by category or keyword. If you know of additional resources that could be added, please contact research.director@psichi.org

---

*SPECIAL ISSUE 2018
Psi Chi Journal of Psychological Research
COPYRIGHT 2018 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (SPECIAL ISSUE, VOL. 23, NO. 2/ISSN 2325-7342)*
Publish Your Research in *Psi Chi Journal*
Undergraduate, graduate, and faculty submissions are welcome year round. Only the first author is required to be a Psi Chi member. All submissions are free. Reasons to submit include

- a unique, doctoral-level, peer-review process
- indexing in PsycINFO, EBSCO, and Crossref databases
- free access of all articles at pschi.org
- our efficient online submissions portal

View Submission Guidelines and submit your research at [www.psichi.org/?page=JN_Submissions](http://www.psichi.org/?page=JN_Submissions)

---

**Become a Journal Reviewer**
Doctoral-level faculty in psychology and related fields who are passionate about educating others on conducting and reporting quality empirical research are invited to become reviewers for *Psi Chi Journal*. Our editorial team is uniquely dedicated to mentorship and promoting professional development of our authors—Please join us!

To become a reviewer, visit [www.psichi.org/page/JN_BecomeAReviewer](http://www.psichi.org/page/JN_BecomeAReviewer)

---

**Resources for Student Research**
Looking for solid examples of student manuscripts and educational editorials about conducting psychological research? Download as many free articles to share in your classrooms as you would like.

Search past issues, or articles by subject area or author at [www.psichi.org/?journal_past](http://www.psichi.org/?journal_past)

---

**Add Our Journal to Your Library**
Ask your librarian to store *Psi Chi Journal* issues in a database at your local institution. Librarians may also e-mail to request notifications when new issues are released.

Contact *PsiChiJournal@psichi.org* for more information.